ИНСТИТУТ ЗА ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ НА БЪЛГАРСКАТА АКАДЕМИЯ НА НАУКИТЕ

Икономически Изследвания
ECONOMIC STUDIES

CONTENTS

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OPPORTUNITIES AND PROSPECTS FOR JAPAN'S INVESTMENTS IN BULGARIA

This expert report has been prepared by Economic Research Institute at the Bulgarian Academy of Sciences, in connection with the initiative of the President of the Republic and the Embassy of Japan for a Bulgaria-Japan Business Meeting on February 5th, 2020. It presents an analysis and assessment of the opportunities and prospects for Japan's investments in Bulgaria, in particular:

- *Main trends in Japan's investments in the EU Member States from Central and South-Eastern Europe (CSEE) are studied and outlined to identify the specifics of Japan's investments abroad by countries, sectors, productions, forms, in which they invest. In this way, a targeted approach is introduced, tailored to the specifics of these investments.*
- *A historical overview is presented – the successes of trade and economic cooperation in the area of investments, in order to outline how the good practices and experiences in the past would support future investments from Japan in Bulgaria.*
- *A critical review of the comparative advantages of investing in Bulgaria is presented along with an identification of those, that are important to Japanese investors.*
- *Studied is the current European regulatory framework for foreign investments in order to identify the opportunities and policies that could support Japanese investors in Bulgaria as an EU Member State.*
- *Outlined are important strategic priorities of the Bulgarian economy in regard to the development of innovations, information technologies and green economy, in order to direct the interest of Japanese investors towards them.*

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- *Identified are the opportunities for using the local raw materials through Japanese investments in Bulgaria, as well as the potential for waste processing and circular economy.*
- *Determined are sectors and productions where the capacity and interest of the Japanese investors coincide with the opportunities and advantages of the Bulgarian economy.*
- *Identified are economic sectors and productions of mutual interest to Japanese investors and Bulgarian business.*

Attracting investments from Japan would have a significant national economic effect in implementing the strategic long-term priorities of the country. For the Bulgarian business, this would expand the economic space to high technologies and partnerships with Japanese companies and the access of Bulgarian goods to the Japanese market. For the Japanese economy and investors, expanding the economic space to Bulgaria would have a strong positive effect, including increasing their presence on the EU markets.

JEL: O23; O24; O25; O53

I. JAPAN'S INVESTMENTS IN CENTRAL AND SOUTH-EASTERN EUROPEAN COUNTRIES

1. Japan's direct investments in European Union Member States

- EU-Japan Economic Partnership Agreement (since February 2019) provides wide opportunities for expanding the trade and investment relations between the EU and Japan, and in particular for the growth of the investment relations between Japan and Central and South-Eastern Europe, particular Bulgaria.

- In 2018, mergers and acquisitions of European companies by Japanese companies increased in number and value. Japanese companies have free funds (estimated at 800 billion EUR), which suggests that they will continue to expand the investments abroad, provided the economic and political environment is favourable.

- Japanese investors are interested in innovative productions, their focus of importance being particularly on the political, institutional and macroeconomic stability of the country hosting the Japanese investments.

- Though the main destinations for Japan's foreign direct investments (FDI) are the Western European EU Member States and Russia, in recent years, Japanese companies settle permanently in the countries of Central and South-Eastern Europe (CSEE) by investing in infrastructure projects and efficient productions. This highly stimulates the increase of the role of Bulgaria as an attractive investment destination for Japanese investors.

Attracting FDI from Japan has been for years, and continues to be, important for Bulgaria. The economic and investment relations between the two countries have developed with different intensity over the years, but the Japanese companies are preferred foreign investors in Bulgaria because of the quality and type of investments they do.

After 1979, Japanese companies have been increasing their investment activity abroad, thanks to the liberalization of the investment regime in Japan towards the search for natural resources to provide raw materials for the Japanese industry, especially metals needed for the development of electronics, fine mechanics and equipment.[10] Japanese investors realize significant FDI also in high-tech and efficient productions.

Years ago, European companies faced trade barriers to exports to Japan, which hindered their competitiveness. As a result of the EU-Japan Economic Partnership Agreement (since 01.02.2019), the trade barriers restricting the EU exports to Japan are lifted. The EU-Japan trade agreement removes the following restrictions for mutual trade: eliminates duties and other trade restrictions; introduces clear rules for cooperation in global trade and rejects the attempts to increase protectionism. Also in force is the EU-Japan Strategic Partnership Agreement, a bilateral framework agreement that increases partnership and provides a common framework for improving political and sectoral cooperation, as well as for joint actions to overcome the regional and global political and economic shocks and challenges.

Japan's FDI in EU Member States, 2010-2017 (billion EUR)
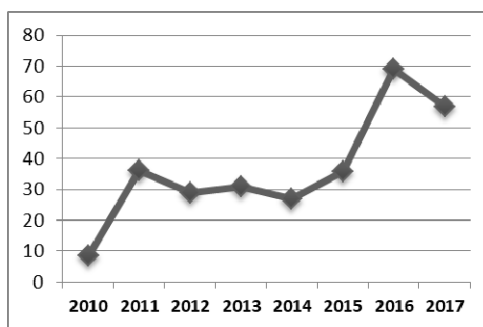
Source: Eurostat.

The EU-Japan Strategic Arrangement (as of 01.02.2019) gives Japan the opportunity to operate in a single open economic space, which consists of 1/3 of the world economy. More than 90% of the EU exports to Japan are duty-free, and with the full implementation of the Agreement, 97% of the European goods will freely enter Japan. Annually, EU companies export to Japan goods for nearly 70 billion EUR and services for 28 billion EUR. European Union is preferred FDI destination abroad for the Japanese investors in order to enter the European Single Market. The accumulated FDI from Japan in the EU reach 300 billion EUR. The EU foreign direct investments in Japan are 1.6% of total FDI realized by EU-28 outside the EU, while Japan's FDI in EU are 4.1% of its total FDI. Negotiations between the EU and Japan continue for the resolving of disputes over standards and investment protection. The goal of both the EU and Japan is to converge the positions on mutual

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[10] The change in the regulatory regime of Japan, i.e. The Foreign Trade Control Law, the Foreign Capital Law, which have limited the expansion of Japanese companies abroad, contributes to the Japanese companies entering the markets abroad.

investment protection and to create a stable and secure investment environment in Europe and Japan.

Japan's FDI in Europe, Eastern Europe and Western Europe, 2010-2018 (million USD)
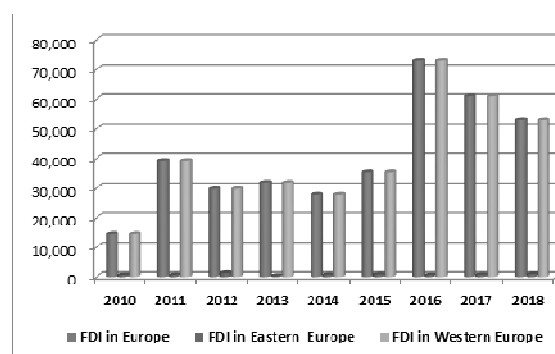
Source: Japan Balance of Payments basis, net and flows, JETRO.

Since 2010, Japan's direct investments in Europe have increased, and the main destinations of Japanese companies are the developed economies in Western Europe. In Eastern Europe Japan's FDI register a smaller increase. Japan's FDI are highest in Germany and the United Kingdom.

Main destinations of Japan's FDI accumulated in Germany and the United Kingdom, 2010-2018 (million USD)
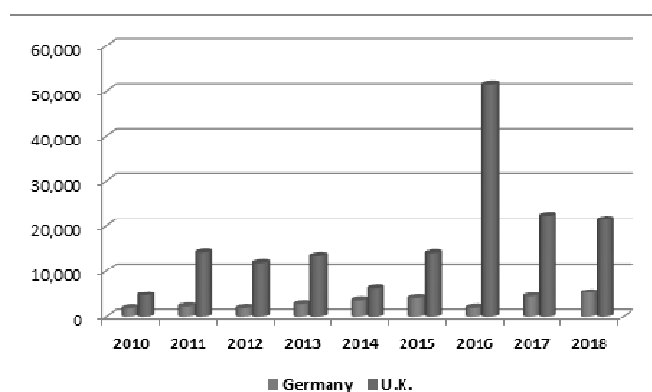
Source: Japan Balance of Payments basis, net and flows, JETRO.

Among the Eastern European countries, the largest Japanese direct investments are realized in the EU Member States of Central Europe (Hungary, Poland, Czech Republic and Slovakia), which have significant economic potential and efficient productions, as well as in Russia, which is a source of energy and natural resources. The interest of Japanese investors in the CSEE region has increased since 2014.

Japan's FDI in Eastern Europe and Russia, 2010-2018
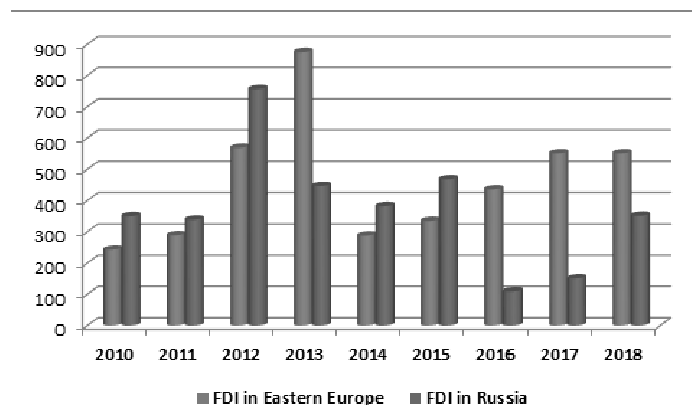
Source: Japan Balance of Payments basis, net and flows, JETRO.

2. Advantages of Central and Eastern European countries for the implementation of Japan's FDI

For the Japanese investors, the CSEE countries have the following advantages: developed industrial base, qualified labour force, trained management staff, a favorable geostrategic economic position as part of the European Single Market, relatively well-established infrastructure – roads, railways, electrical powers, etc. The programs for FDI promotion that provide tax relief, duty-free import of equipment, employment incentives, advanced information and telecommunication relations and other benefits, as well as lower labour costs than in Western Europe, also encourage the Japanese investors to locate on the Central European markets. *The labour costs per unit are lower in Bulgaria and Romania compared to those in the Central European countries (Hungary, Slovakia, Czech Republic, Poland).*

3. Significant Japan's direct investments in Central and South-Eastern European countries

Japan is **Hungary**'s main Asian investor and Hungary is Japan's main investment destination in Europe in 2018 (IBM-PLI Global Location Trends 2019). As of 2019, in Hungary operate 170 Japanese companies with 35 000 employees. Japanese companies import in Hungary innovative technologies for the production of goods with medium and high added value and contribute to the development of the scientific research in the country. About 300 Japanese companies, with 40 000 employees, operate in Poland. About 1/3 of them are in the manufacturing sector – from machine-building and equipment to manufacture of food products and business services. Since 1993, in the **Czech Republic** are implemented 130 Japanese direct investment projects with a total value of over 5 billion

USD and are created 28 000 jobs. Offices, manufacturing plants, R&D equipment and facilities have been opened by 250 Japanese companies in this country. The goal of the Czech Republic is to attract Japanese direct investments in innovative productions, especially in productions with high added value like biotechnology, nanotechnology and ICT. As of January 2019, in **Slovakia** operate 64 Japanese companies. Japan provides substantial financing to Slovakia as grants (415 million JPY), technical cooperation (1.49 billion JPY), loans for construction of highway, large infrastructure projects (11.1 billion JPY). In **Estonia** operates MBK Co. Ltd., a Japanese trade bank, which participates in real estate trading in partnership with Estonian company BitOfProperty (BOP). The Japanese bank will work with the Estonian Cryptocurrency Stock Exchange Angoo Fintech.

Japan focuses also on non-EU countries, supporting their transition to a market economy. Japan Bank for International Cooperation (JBIC) opens an investment fund in **Serbia** to support the development of the economic relations between the two countries. Japan expands its investment relations with **Ukraine**. Discussed are Japan's FDI in infrastructure projects in Ukraine. Financial support of Japan to Ukraine amounts to 1.8 billion USD in 2014-2019.

A large part of Japan's FDI for the CSEE countries is in the manufacturing industry, in particular in transport equipment and electronics. The companies Toyota, Suzuki, Sumitomo, Panasonic, Sony, are located in Central Europe based on established joint ventures. Established are also joint ventures between Japanese companies and Western European companies, an example being the joint venture between Toyota and Peugeot, which jointly manufactures car parts in the Czech Republic.

The impression is that Japanese investors value the partnership in the respective country, which often results in the establishment of joint ventures with local firms or the country concerned. This policy creates further guarantees and a mutual interest for both Japanese investors and local businesses.

The main driver of Japan's FDI in CSEE is the search for investments to expand the markets for Japanese goods. Entering the CSEE countries, Japanese companies gain access to the European Single Market, the markets of CIS, Mediterranean countries and the EFTA.

So far, the share of Japan's investments in Bulgaria is smaller than in other CEE countries, but Bulgaria is commensurate with those countries in economic and institutional potential and is among the leaders by its macroeconomic stability. For Japanese investors, Bulgaria is also an opportunity for competitive entering on the European markets.

II. MACROECONOMIC ASPECTS OF THE INVESTMENT CLIMATE IN BULGARIA

Characteristics of the Bulgarian economy:

- sustainable growth rates;

- low inflation;

- wages are lower than in the CEEC average;

- fixed exchange rate;

- high degree of openness of the economy;

- balanced budget and low taxes;

- low debt levels;

- favourable investment climate.

1. Gross Domestic Product

Economic growth is relatively high, but in itself, it is not sufficient to catch up the EU high standards. In order to achieve these results, it is also necessary to attract large investors from abroad.

According to the estimation by the Economic Research Institute at the Bulgarian Academy of Sciences, in the next three years, economic growth will remain at the levels of about 3-3.5%. Domestic demand will remain a leading factor for the GDP growth in terms of both consumption and investments. At the same time, final consumption growth is expected to slow down as a result of lower public consumption and a slowdown in private consumption growth, due to the exhaustion of the opportunities of employment growth. On the other hand, the increase in investments is expected to accelerate, supported mainly by public and foreign investments.
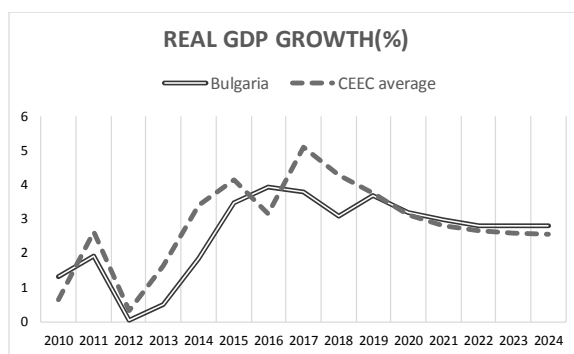
Source: IMF, World Economic Outlook.

Economic growth rates are above the EU average, but there is a slight lag behind the CEEC countries. ***The lag is not significant and could be overcome with a targeted government policy for accelerating economic growth. Attracting FDI is an important element of such a policy.*** The increase of wages and the improved household expectations have a positive impact on private consumption. Growth in consumption in the public sector increases, reflecting mainly the increase in costs for personnel and maintenance. Investments slowly

recover, but net exports, which have been a main driver of growth until recently, have already a negative contribution to the total growth. This is due both to a slowdown in export growth and stronger domestic demand, which has affected import volumes, including imports of consumer goods. The trend of recent years towards closing the gap between actual and potential GDP has continued.

2. Inflation

Inflation is under control and in line with global trends. Under a currency board arrangement and a stable fiscal position, the inflation will not be a problem in the country's accession to ERM II.

Annual inflation in 2019 has increased slightly compared to the reported one at the end of 2018, and is likely to remain at 2.5-3% in the coming years. The increase in the prices of services and food contributes most to the total inflation. Goods and services with administratively set prices, as well as tobacco products, also have a small positive contribution, while energy products have a negative contribution to the total inflation due to the drop of the international oil prices in EUR on an annual basis.

INFLATION (CPI, PERIOD AVG.)
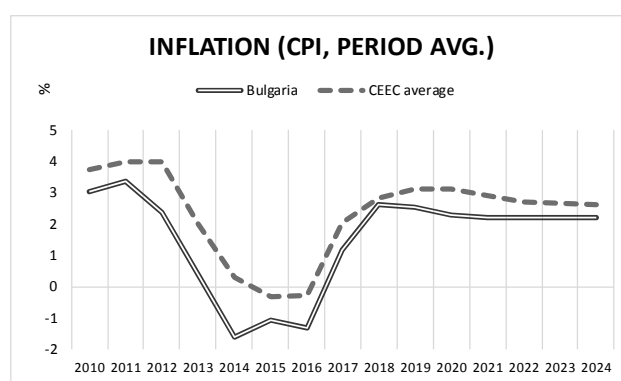
Source: IMF, World Economic Outlook.

Despite the increasing inflation pressure, there is no reason for concern. The core inflation has increased but remains low. There is no reason to look for a direct relation between the increase of the average wage and the inflation. The latter reflects rather the output gap between potential and real GDP.

3. Exchange rate and foreign reserves

The currency board arrangement remains a factor of stability. Monetary base coverage with reserves amounts to more than 150% (the required minimum level of coverage is 100%), which certifies the stability of the currency board. The commitment to maintain the

currency board arrangement at the current level of the fixed exchange rate until the country's accession to the euro area is always present in the program of all governments and is supported by all political parties in the Parliament.

EXCHANGE RATE AND FOREIGN RESERVES
Dec. 2009 = 100
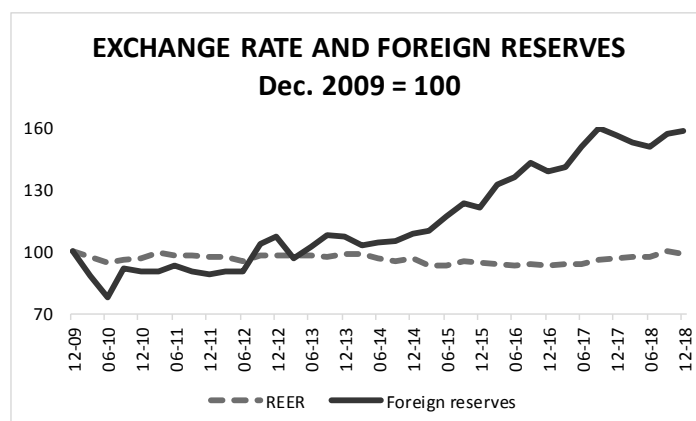
Source: Bulgarian National Bank.

4. Labour market

The labor market has a steady decrease in unemployment.

Wages are lower than in the CEEC average levels, and this is not at the expense of the quality of the manufactured production, but rather to the lower price level in the economy. This creates serious advantages for potential investors. Undoubtedly, both price levels and wages move towards catching up with the EU levels, but the process of full alignment will take decades. Providing decent payment requires parallel processes of increasing productivity, ***investing in the real sector***, and intensifying the productions towards intelligent growth.
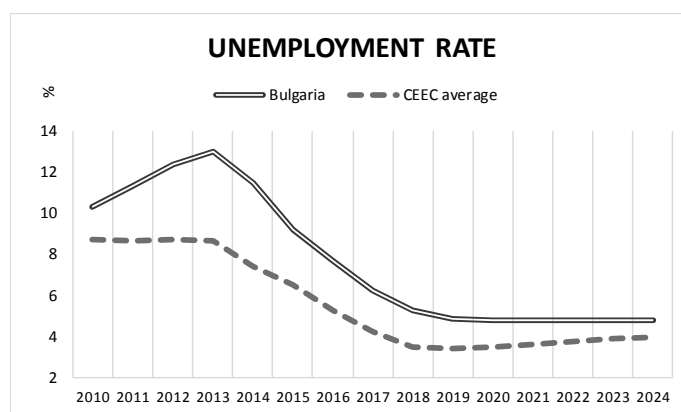
UNEMPLOYMENT RATE

Source: IMF, World Economic Outlook.

Policies to improve the knowledge, skills and competences of the current workforce are central to employment dynamics; preparing young people for work in our education system; for efficient activation of the inactive and participation in the labour market.

MINIMUM WAGE - EURO

CEEC avg. €522

Source: IMF, World Economic Outlook.

AVERAGE WAGE - EURO

CEEC avg. €889
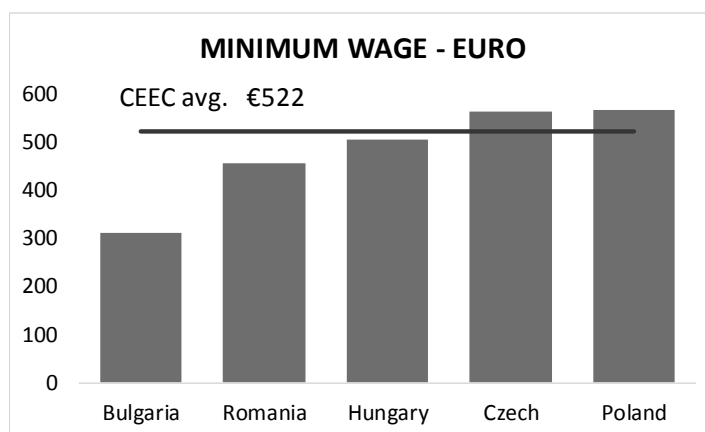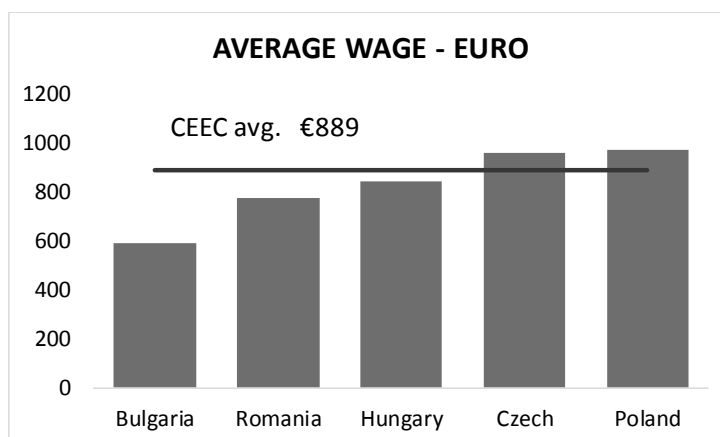
Source: IMF, World Economic Outlook.

5. External sector

The role of the external sector as a significant factor of growth in recent years alternates with domestic consumption. In the long run, we expect a steady trend towards a leading role of the external sector, based on the exports of goods with medium and high value-added.

The export structure, established in recent years, shows that Bulgaria remains an exporter mainly of goods with a low level of processing, hence with low value-added. About 40% of

exports are raw materials. With the current export structure, Bulgaria cannot rely on lasting competitive advantages to ensure the sustainable development of a strategy of an export-oriented economic growth. ***A possible way out of this situation is the local use of these raw materials. From this point of view, attracting FDI and creating new productions are of huge significance.***

The import structure shows a high dependence of the Bulgarian productions on imported raw materials. The imported raw materials exceed 35% of the total commodity imports, accompanied by high import intensity of exports. Thus, foreign trade leads to a wide openness of the Bulgarian economy, which in turn defines the foreign trade as a strong transmission mechanism for transferring the international economic environment to the Bulgarian economy.

6. Fiscal sector

Stability of the fiscal sector stands out as the most significant advantage of the economy. The balanced budget and the low public debt allow for enhanced government support for large investment projects. The size and structure of the public debt are among the most significant advantages of the Bulgarian economy.
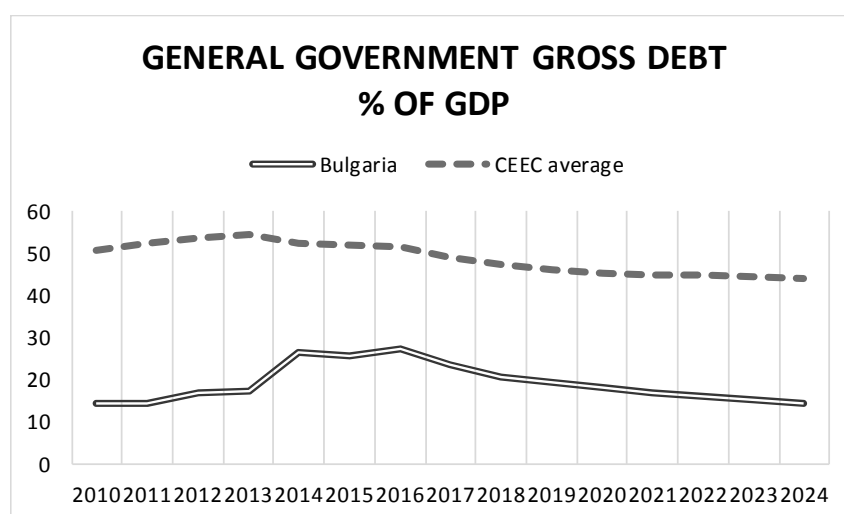
	Moody's	S&P	Fitch
Bulgaria	Baa2	BBB	BBB
Czech	Aa3	AA-	AA-
Hungary	Baa3	BBB	BBB
Poland	A2	A-	A-
Romania	Baa3	BBB-	BBB-

Source: Ministry of Finances and websites of the relevant agencies.

The improvement in tax revenue collection, observed in recent years, provides an opportunity to maintain low levels of effective tax rates, which are the lowest in the EU and one of the lowest in the world.

Bulgaria has considerable "fiscal space" to use. To encourage investments in the country, the government is committed to implement an active economic policy, including to undertake state guarantees for structurally defining investments. Maintaining a balanced budget and low public debt levels is a priority policy.

7. Financial sector

The financial system is based on the principles of the currency board and excludes the use of monetary instruments. In the short and medium-term, the fixed exchange rate provides stability. In the medium term, the country is expected to become a full-fledged member of the euro area.

The consolidation processes in the banking sector continue; the profit in the system increases; and the monetary statistics shows that credit activity increases for the second consecutive year.

III. REGULATORY CONDITIONS FOR INVESTMENT IN BULGARIA

1. Positive aspects of the legislation and the policies in place

Bulgaria pursues an investment policy in accordance with the commitments of the country as a member of the EU and the WTO, in full compliance with the international agreements under specific agreements with individual countries and integration communities. In this context, for Bulgaria, as an EU member, the EU-Japan Economic Partnership Agreement (EPA) and the EU-Japan Strategic Partnership Agreement (SPA) create favourable political and legal premises for the development of economic exchange and investments with Japan.[11]

Bulgarian investment legislation is based on the principle of equal treatment of Bulgarian and foreign entities and guarantees that investors are treated equally, regardless of their nationality. There are restrictions on economic activities of foreign entities in specific sectors and activities (e.g. gambling, tobacco processing, medical research). The realization of an economic activity in Bulgaria does not require mandatory registration of the foreign investor as a trader, except in certain sectors with an introduced licensing regime. At the same time, there is no restriction on the amount of foreign participation in the registered in Bulgaria forms of economic and investment activity.

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[11] https://ec.europa.eu/trade/policy/in-focus/eu-japan-economic-partnership-agreement; https://eeas.europa.eu/delegations/japan_en/57491/EUJapan%20Strategic%20Partnership%20Agreement%20(SPA); https://www.eu-japan.eu/events/eu-japan-business-collaborations-third-markets.

Investment Promotion Act (IPA) and its Implementing Regulations (IRIPA) introduce a system of incentives for investment in fixed tangible and intangible assets and the related new jobs, in accordance with Regulation № 651/2014 of the European Commission. Realistically assessing the current economic challenges, with the Investment Promotion Act and its Implementing Regulations, Bulgaria implements a policy of:

- Increasing investments in technological development in productions and services with high added value and creating new high-performance jobs;

- Reducing regional disparities in social-economic development;

- Integrated counteracting to negative trends in the investment activity and employment, resulting from the restructuring processes of the European and global economy over the last decade.

According to the Investment Promotion Act and its Implementing Regulations, for the promotion of investments in specific industries, investment certification approach is applied. Depending on the size of the investment, the economic industry and the region of the country where it is realized, the investor can receive a certificate for class of investment ("class A" and "class B") or a certificate for priority project.

Table 1

Measures to promote investments subject to certification

Measures for promotion / Size of investment	Class Priority 100 million BGN 50-150 jobs	Class A 10 million BGN 25-150 jobs	Class B 1.5 million BGN 10-100 jobs
Reduced administrative procedures	✔	✔	✔
No public tenders – no competition	✔	✔	✔
Financial support for vocational training	✔	✔	✔
Reimbursement of social security costs	✔	✔	✔
Services for individual partners	✔	✔	
Financing the construction of technical infrastructure	✔	✔	
Public-Private Partnerships	✔		
No taxes when changing land status	✔		
Acquisition of land at lower prices	✔		
Research and development subsidies	✔		

Source: Ministry of Economy of Republic of Bulgaria, 2019.

Investments that can receive a certificate for class are investments in fixed tangible and intangible assets and the related new jobs, which cumulatively meet the following conditions:

- They are related to the creation of a new enterprise or the expansion of an existing enterprise/activity.

- They are realized in any of the following economic activities: from the industrial sector – manufacturing; from the service sector – high-tech activities in information technologies and services, R&D and professional activities in central offices, education, human health care and medical-social care with accommodation, cargo storage and supporting transport activities.

- The income from the investment project is at least 80% of the total income of the enterprise.

- The investment continues for at least 5 years, and for small and medium-sized enterprises – 3 years.

- The term for completion of the investment is up to 3 years.

- The investment in one site is not below the minimum amount of 20 million BGN for class A and 10 million BGN for class B. This threshold may be reduced for investments in economically disadvantaged regions, as well as for investments in high-tech activities in the industrial sector of the economy and in the service sector.

- At least 40% of the eligible costs are financed through own resources or through external funding in a form that excludes public support.

- The investment creates and maintains employment directly related to the implementation of the investment project, representing a net increase in the number of employees in the enterprise, maintained for a minimum period of 5 years for a large enterprise (3 years for SME).

- The acquired assets are new and purchased on market terms by entities independent of the investor.

Investments with a certificate for class are encouraged to complete the investment project through:

- Reduced deadlines for administrative service (for class A and B);

- Individual administrative service (for class A);

- Possibility to acquire property rights or restricted real property rights under preferential conditions (for class A and B);

- Financial support for the creation of elements of the technical infrastructure (for class A and two or more investment projects for class B);

- Financial support for training for the acquisition of vocational qualifications of people who have occupied the new investment-related jobs (class A and B).

Bulgaria actively promotes investments in all industries through the implementation of the legal framework for certification of investments for class A and B, as well as priority investment projects. These include investment projects that can be realized in any sector of the economy, are significant for the economic development of the country or its regions, and meet the requirements set in the Investment Promotion Act, such as:

1. The size of their investments exceeds at least 3 times the minimum size under Art. 12, para. 2, item 5 for class A, determined in the implementing regulations of the law.

2. They create employment within the meaning of Art. 12, para. 2, item 7 through investments in disadvantaged regions or in high-tech activities, the minimum number of employees of which is determined in the implementing regulation of the law.

3. They engage with the construction of industrial zones with the necessary technical infrastructure for attracting investments under the conditions and procedures determined in the implementing regulations of the law.

4. They engage with the construction of tech parks with the necessary technical infrastructure to attract investments in research and/or education, and/or information technology, including innovative activities for technological renewal of manufactured products and technologies under the terms and procedures determined in the implementing regulations of the law.

Priority investment projects can benefit from all promotion measures provided for investments with a certificate for class, as well as from the following measures:

- Transfer or incorporation of limited real property rights from state and municipal companies at prices below the market price;

- Financial grants for investments in education and research and investments in manufacturing;

- Institutional support and public-private partnership;

- Reduced terms for administrative services provided by the municipality where the investment is realized;

- Individual administrative services provided by the municipality where the investment is realized.

The promotion of priority investment projects is done under the conditions and procedures determined in the implementing regulations of the law, in accordance with Regulation (EU) № 651/2014 as a state aid scheme and/or in accordance with the requirements of the State Aid Act, Art. 22g. (New – SG, No. 41/2009).

Bulgaria implements state aid in accordance with Regulation (EU) № 651/2014. Fully in line with EU legislation for investment promotion, Bulgaria may apply aid schemes in the form of advantages, and in the future they are subject to a special condition for promotion effect, given that this type of aid is granted in accordance with EU state aid procedures that are different from those of other aid categories. For the assessment of the promotion effect of these schemes, the moment when the measure is first included in the original scheme is crucial.

Investments can be promoted also by regional operational aid, regional aid for urban development, aid to SMEs for access to finance, implemented in accordance with the requirements of Regulation (EU) № 651/2014, provided that the specific conditions set for these aid categories are fulfilled.

Table 2

Regional profile and smart specialization of investments in innovations in the Republic of Bulgaria for the period 2014-2019

Northwestern region	Northcentral region	Northeastern region
Mechatronics and Clean Technology	Mechatronics and Clean Technology	Mechatronics and Clean Technology
Healthy Life and Biotechnology Industry	Healthy Life and Biotechnology Industry	Healthy Life and Biotechnology Industry
New technologies in the creative and recreational industries	Informatics and ICT	New technologies in the creative and recreational industries
Southwestern region	**Southcentral region**	**Southeastern region**
Informatics and ICT	Informatics and ICT	New technologies in the creative and recreational industries
New technologies in the creative and recreational industries	Mechatronics and Clean Technology	Mechatronics and Clean Technology
Healthy Life and Biotechnology Industry	Healthy Life and Biotechnology Industry	Healthy Life and Biotechnology Industry

Source: Implementation of ISSS 2014-2020. National and Regional Review, "Economic Policy" Directorate at Ministry of Economy, June 2019.

In line with EU requirements based on the Innovative Strategy for Smart Specialization (ISSS), Bulgaria meets the strategic goal of making a quality leap in its innovation performance at EU level to overcome the social challenges in the demographic field (reducing brain drain, attracting successful Bulgarians, promoting youth entrepreneurship), sustainable development, intellectual capital and the health of the nation. In this regard, the country's investment policy is directed at achieving several goals:

- Focus on investments to develop innovation potential by regions and in the identified thematic areas for the creation and development of new technologies, leading to competitive advantages and increasing the added value of the national products and services;

- Support for increased use of technologies, methods and good practices that improve resource efficiency and the implementation of ICT in enterprises across the industry.

In the period 2014-2020, in innovation development are directed 1461.3 million EUR. As of mid-2019, the activated financial resource on ISSS amounts to 52.6% of the ISSS indicative budget (compared to 48.5% in the previous year). Funds focused on ISSS thematic areas amount to 414.1 million EUR provided as financial grants. Most funds are spent in the thematic areas "Mechatronics and Clean Technologies" (20.4%), "Informatics and ICT" (14.1%), "Healthy Life and Biotechnology Industry" (11.9%), and "New Technologies in the Creative and Recreational Industries" (7.5%).

The promotion of investments at the level of enterprises and regions with a state aid scheme in the form of grants is implemented in full compliance with the requirements of the EU law.

In addition, implemented is investment crediting by the Bulgarian Development Bank (BDB) under flexible agreement terms. BDB offers also syndication or external co-financing of the credit with other financial institutions, including the European Investment Bank (EIB) under the European Fund for Strategic Investments (EFSI). EFSI has provided an additional 20 million EUR to Bulgarian SMEs in the form of guarantees for the period 2017-2020.

National Guarantee Fund (NGF), as part of the Bulgarian Development Bank Group, has a mission to support the access to financing for Bulgarian SMEs. Through the mediation of 22 trade banks, NGF has supported more than 5000 companies to receive financing for over 600 million EUR. NGF implements also two guarantee financial instruments, co-financed by the Ministry of Agriculture, Food and Forestry, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund.

2. Opportunities and prospects for development of the investment policy

As an EU member state, Bulgaria commits to a policy of updating its investment regime in line with the choice of priorities of social-economic development. In 2019 the Government of the Republic of Bulgaria has presented for public consideration a National Development Program "Bulgaria 2030" on the basis of a serious analysis of the social-economic development of the country after its accession to the EU.

After extensive discussion with the social partners and stakeholders, National Development Program "Bulgaria 2030" shall enter into force on 20.01.2020 as a medium-term strategy for social-economic development of the country.[12]

In the interest of improving the business climate in the country, promoting convergence in the EU and protecting the interests of Bulgarian business and citizens, for achieving economic growth and prosperity, the following priority directions are outlined, focusing on:

- Improving competitiveness conditions, including through the promotion of investments in innovative development and stimulating the export of Bulgarian goods and services;

- Social partnership and active dialogue on the priorities in the development of the Bulgarian industry;[13]

- Developing a national strategy for Bulgaria's place in Industry 4.0 and the Digital Single Market;

- Making R&D a top priority for Bulgaria by: promoting applied research; supporting R&D promotion and innovations in the enterprises, and investments in innovation and development infrastructure;

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[12] Vision, goals and priorities of the National Development Program "Bulgaria 2030", approved by Council of Ministers Decision No. 33 of 20.01.2020.
[13] EU. (2019). A vision for the European Industry until 2030: Final Report of the Industry 2030 high level industrial roundtable. EU, 27 of May 2019, ISBN 978-92-76-08793-9.

- Strengthening policies for human resource development – education and training, lifelong learning and skills validation;

- Introducing e-government so that the state can communicate with the business and citizens in a transparent, more effective and more efficient way by modernizing the business environment and more purposeful reduction of corruption.

The changes in the investment policy of Bulgaria can be outlined in three main directions, where the experience of Japan can be an important contribution to the mutual cooperation with Bulgaria, as follows:

- Strategic and operational planning of modern technological development, decarbonisation and development of circular and green economy and the corresponding updating of the conditions and incentives for investments provided to foreign investors from third countries outside the EU;

- Changes that update the regulations to promote entrepreneurship in high-tech industries and products and in SMEs, combined with their role at a regional level;

- Legislative changes for promotion of foreign investments in education, personnel qualification in certain fields and R&D with the involvement of BAS and the universities in the country.

In the context of a dynamically changing and uncertain international economic environment, the following **opportunities** exist for Bulgaria and Japan in the field of investment cooperation:

- Accelerating decision-making on strategic projects by improving the capacity of the ministries, departments and agencies in strategic planning. Of strategic interest to Bulgaria are the projects in railway transport, bio-agriculture, digitalisation of the economy, waste utilization and more. Their development and adoption with a state guarantee should make it possible to shorten pre-project studies to the technologically possible time of 1-1.5 years.

- Accelerating the transition to the circular economy is another main investment area for Bulgaria. Japan has accumulated experience in this area. In Bulgaria, the introduction of the Japanese experience can accelerate through targeted programs for the small and medium-sized companies to implement circular economy schemes that will really contribute to structural changes at the enterprise level. SMEs are an area where Bulgaria can explore the positive experience of some CEE countries, which actively change their investment regimes to attract foreign investments and regional development.

- Transition to the digital transformation of the industry and the service sector.

- Promoting innovations and competitiveness at the expense of national public funds and assimilation of EU funds.

- Promoting a qualified labour force through investments in education, training and retraining of the labour force.

- Promoting social economy, especially in view of the demographic crisis and the social problems of the rapidly transforming societies under the new conditions of international competition, economic and social inequalities.

In a global and European plan, concerning the attracting of foreign investment, there is a process of **differentiation of the investment regimes of the individual countries and regions in order to increase the selectivity** of the host countries of foreign investments with respect to national goals in certain sectors and activities.

Common criteria applied in changing the investment regimes include the priorities of innovative growth and rebalancing of the regional development of specific countries. Japan also focuses on this approach with its vision of attracting foreign investments and with its active policy of developing economic cooperation with the EU and other global partners.

3. EU regulatory requirements for third-country investors and the opportunities they provide to the competitiveness of the Bulgarian legislation to attract investments, including from Japan

Concerning the investment regime, Bulgaria, as an EU member state, has taken over EU policies in all main areas of structural changes in the economy that are open to trade and economic cooperation with third countries.

A favourable basis for mutual cooperation with Japan is the fact that, in accordance with the section on investments in the EU-Japan Strategic Partnership Agreement (SPA), the parties are envisaged to provide each other a Most Fostered Nation (MFN) clause and to apply the principle of national treatment (NT) with regard to establishing and functioning of investors and investments (considered before and after the conclusion of the SPA). Bulgaria is interested in implementing a policy of deepening the economic cooperation with Japan on the basis of an update of the EU-Japan arrangements in the mutual relations for establishment of the standards for protection of investors and for the settlement of disputes concerning joint investments.

At the beginning of 2020, in the context of a dynamically changing and uncertain international economic environment, investment regimes of both EU and other third countries face **some changes**.

First, for Bulgaria, as an EU member state, it is important in its relations with third countries to comply with **Regulation (EU) 2019/452 of the European Parliament and of the Council on 19th March 2019 establishing a framework for screening of foreign direct investment in the Union**. The reason for adopting the regulation is that EU member states share the responsibility concerning new or already realized FDI for screening and monitoring of **security risks created by foreign investments in assets, technologies and infrastructure of key significance**. The new regulation should start on 10th October 2020 and apply to a wide range of foreign investments in EU member states, through which are established or maintained long-term and direct relations with investors from third countries, including government entities, and businesses operating in an EU Member State. However, this regulation *does not cover portfolio investments*. So far, the new framework for

screening and monitoring the foreign direct investments does not extend to EU investments in third countries. The new framework for screening the foreign investments at a supranational level includes new competences at EU level.

Currently, 14 member states (Austria, Denmark, Germany, Finland, France, Latvia, Lithuania, Hungary, Italy, the Netherlands, Poland, Portugal, Spain and the United Kingdom) have national FDI screening mechanisms that vary in design and scope. Bulgaria has no changes in its national security legislation and is involved in the creation of a cooperation mechanism, with which member states and the European Commission will be able to exchange information and set for discussion specific cases when an investment threatens the security or public order of several member states, or when an investment might affect a project or program of interest for the entire EU, such as "Horizon 2020" or "Galileo".

Given that the EU is interested in promoting international investment cooperation, the arrangements with Japan under the Strategic Agreement that promote investments, including through the exchange of experience, best practices and information on issues of common interest, are to be implemented.

Undoubtedly, after the adoption of Regulation (EU) 2019/452 of the European Parliament and the Council on 19th March 2019, EU member states retain the final say as to whether or not the realization of a specific investment operation should be allowed on their territory.

Second, **the European Green Deal**, presented by the European Commission at the end of 2019, is considered a roadmap for the European Union with actions for more efficient use of resources by moving to a clean, circular economy and for halting the climate change, reversing the tendency to lose biodiversity, and reducing pollution.[14] The European Green Deal covers **all sectors of the economy**, in particular transport, energy, agriculture, construction, and industries such as steel, cement, ICT, textiles and chemicals.

The resulting changes to the EU law and investment policy will respond to the biggest challenges of today (globalization and economic transformation in the conditions of climate changes, the transition to a low-carbon and circular economy, environmental challenges, migration and social problems of poverty and others).

At the core of the agreements with Japan, the EU has put the priorities for economic transformation, reflected also in the concepts development for the EU Multiannual Financial Framework for 2022-2027.

Achieving the goals of the European Green Deal will require **significant investments**. It is estimated that reaching the current climate and energy goals by 2030 will require 260 billion EUR additional investments annually, i.e. about 1.5% of GDP in 2018. These investments will require a mobilization of the public and private sector.

In the context of the global challenges to social-economic development, the new priorities will lead to a combination of rational choice for changes with a consistent policy of

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[14] EC. (2020). The European Green Deal, Communication from The Commission to The European Parliament, The European Council, The Council, The European Economic and Social Committee and The Committee of The Regions, Brussels, 11.12.2019 Com(2019) 640 Final.

promoting investments. To this end, Bulgaria is interested in developing its relations with Japan, which may be contributed by the further improvement of the investment environment.

The brief presentation of the regulatory framework for attracting foreign investments in Bulgaria indicates that there is a desire to provide foreign investors with the best possible conditions.

In pursuit of the medium-term development goals by 2030, Bulgaria consistently strives to improve its investment and innovation policies. The country is ready to implement projects on the basis of achieved mutual interest with the specific foreign partners. In this regard, as an EU member state, Bulgaria, with its involvement in the assimilation of European programs and funds, provides new opportunities for cooperation in trade and investments in the context of the implementation of the EU-Japan Agreements.

IV. SHORT HISTORY OF SIGNIFICANT JAPANESE INVESTMENTS IN BULGARIA AFTER 1990

1. Implemented projects supported by the Government of Japan

Loans from the Japan Bank for International Cooperation[15]

Along this line are granted 65.181 billion JPY (547.74 million USD). Bulgaria has received loans in JPY for the implementation of the following six projects:

- *Loan agreement for the construction of "Vitosha" Hotel (after the privatization "Zografski" Hotel, now "Marinela" Hotel) in Sofia*

The loan is for 4.832 billion JPY, the notes are exchanged in 1975.

- *Loan agreement BG-P 2 for "Eliseina" EAD*

The loan is for 2.081 million JPY and the notes are exchanged in 1995. The implementation of the project for ecological reconstruction of the enterprise is suspended in August 1999 due to financial difficulties of the enterprise. In May 2001, the entire amount spent is reimbursed to the bank.

- *Loan agreement BG-p 3 for KCM Ltd., Plovdiv*

The loan is for 5.955 million JPY and the notes are exchanged in 1995. The loan is fully used and is paid back under the repayment schedule.

- *Loan agreement BG-P 4 for the extension of the port of Burgas*

The total agreed loan amounts to 14.312 billion JPY and the notes are exchanged in 1998. The loan is fully used.

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[15] https://www.bg.emb-japan.go.jp/bg/bg_jap_relations/subsidy_for_bg/loan/index.html.

- ***Loan agreement BG-P for the construction of a section (seventh-ninth station) of Sofia Metro***

The loan is for 12.894 billion JPY and is fully used.

- ***Export Credit between the Japan Bank for International Cooperation and the Republic of Bulgaria for the rehabilitation of "TPP Maritsa East 2" EAD***

The total amount of the export credit is 25.107 billion JPY.

Financing for Bulgaria from the Japan Bank for International Cooperation through the World Bank[16]

Along this line, in 1998 and 2000 are granted 11.9 billion JPY (100 million USD). This money is used to co-finance the implementation of two World Bank programs in the country. Financial Enterprise Sector Adjustment Loan (FESAL) I and II.

Financing from Japan Special Fund at International Financial Institutions[17]

This fund has granted 625 million JPY (5.250 million USD).

Japan Special Fund at the Ministry of Finance, through international financial institutions such as the World Bank and others, has provided financial assistance to Bulgaria through two funds: Japan Social Development Fund (JSDF) and Policy and Human Resources Development Fund (PHRD).

Japan Social Development Fund has financed the implementation of the following projects:

- **Creating a social capital in disadvantaged small communities**

On September 13th, 2001, Bulgaria and the World Bank signed a grant agreement for 370 000 USD. The goal of the project is to improve the welfare of the poorest communities.

- **Project for a protection of the disadvantaged children and people**

On November 14th, 2001, Bulgaria and the World Bank signed a grant agreement for 1.05 million USD for orphans and disadvantaged people.

Policy and Human Resources Development Fund has supported financially the implementation of the following projects:

- **Preparation of FESAL III (PAL 1)**

In June 2000, the World Bank grants 379 000 USD as a donation for the preparation of FESAL III (PAL 1).

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[16] https://www.bg.emb-japan.go.jp/bg/bg_jap_relations/subsidy_for_bg/jp_bank/index.html.
[17] Ibid.

- **Preparation of ASAL II**

In June 2000, the World Bank grants 470 100 USD as a donation for the preparation of ASAL II.

- **Project for Single Revenue Agency**

In 2001, Bulgaria receives a 0.3 million USD donation through the World Bank for increasing the revenue collection.

- **Preparation of project for development of the forestry sector**

On September 11th, 2002, the World Bank signs an agreement for 564 270 USD to be donated for the preparation of a project for development of the forestry sector in the country.

- **Pilot project on a transition from solid fuel to biomass use**

On March 20th, 2003, Bulgaria and the World Bank sign a donation agreement for 890 000 USD to fund a pilot project on the transition from solid fuel to biomass use in the heating systems of municipal buildings.

- **Project for sustainable use of geothermal resources**

On May 23rd, 2003, Bulgaria and the World Bank sign a donation agreement for 770 000 USD to promote the systematic use of geothermal resources.

- **Preparation of PAL 2 for reforms in the structure of the economy**

On September 4th, 2003, Bulgaria and the World Bank sign a donation agreement for 455 000 USD for the preparation of the second PAL loan. The goal of the project is to achieve democratic governance and prosperity of the community through implementation of administrative reform, fight against corruption and support of local self-government bodies.

Technical cooperation[18]

Under this line, the granted support amounts to 9.207 billion JPY (86.047 million USD). The funds are used to receive postgraduate students from Bulgaria, to send Japanese specialists to Bulgaria, to provide Japanese volunteers for cooperation in Bulgaria, to develop technical cooperation projects, to provide equipment, to study the opportunities for development of projects.

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[18] https://www.bg.emb-japan.go.jp/bg/bg_jap_relations/subsidy_for_bg/collaboration/index.html.

Grants[19]

In addition to investments and loans, Bulgaria receives significant grants from Japan for 1.876 billion JPY (15.189 million USD) for the support of the transition to a market economy and the establishment of democratic institutions.

Since 1998, Bulgaria has received grants for 1.170 million JPY under Japanese government programs for financing the implementation of projects at a local level. These are the following projects:

- Construction of a new water treatment plant in the village of Bistritsa for the needs of the capital (2000);

- Non-targeted grant in relation to the damages Bulgaria has suffered from the Kosovo conflict, for 500 million JPY in 1999;

- Grants for 37 projects at local level up to 2004, implemented by Bulgarian non-governmental and municipal administrations such as the Bulgarian Red Cross, Sliven Municipality, Dryanovo Municipality, Smolyan Municipality, Pavel Banya Municipality, etc., amounting to 151,760 million JPY;

- Emergency humanitarian aid for the purchase and supply of food for infants and starving children, as well as the distribution of food in social kitchens and schools. The donation is made through the International Red Cross and is worth 22 million JPY;

- Emergency material aid for about 10 million JPY to the people in distress from the flooded areas in Southern Bulgaria in August 2005.

From the brief presentation of the financed Bulgarian projects by Japan, it can be concluded that the Japanese state is interested in financing the implementation of projects in the port and underground infrastructure, ecology, energy, tourism. Japan has shown its interest in supporting Bulgaria's development also by providing financial assistance to stabilize the economy and local and marginalized communities in the transition to a market economy. After our country's accession to the EU, such projects cannot be supported by the Japanese state.

2. Private Japanese investments in Bulgaria

The largest Japanese investment in the financial sector is Tokuda Bank AD, which is part of the economic group Tokushukai Incorporated, Japan. The Bank was incorporated on December 27th, 1994 as a joint-stock company under the Law on Banks and the Commercial Law of the Republic of Bulgaria. The Bank is licensed to conduct banking activities in the country and operates successfully.

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[19] https://www.bg.emb-japan.go.jp/bg/bg_jap_relations/subsidy_for_bg/free_help/index.html.

One of the largest hospitals in the country – Tokuda, opened in 2006, as part of the health group of the Japanese doctor and entrepreneur Dr. Torao Tokuda. In 2016 it was sold and became part of Acibadem City Clinic, a group of medical establishments in the country.

"Kaliakra Wind Power" wind farm near Kavarna operates since 01.07.2008. The investor of the wind farm is the joint-stock company "Kaliakra Wind Power", which is owned by the Japanese concern "Mitsubishi Heavy Industries" and Bulgarian engineering company "INOS-1". The Japanese side holds 70% and the Bulgarian side holds 30% of the company's shares. The investment is worth around 55 million EUR, with 30% being financed by the shareholders and 70% by the Japan Bank for International Cooperation (JBIC) and Mizuho Bank as creditors.

The wind farm is located on an area of 2700 decares and is estimated to run at 2105 hours per year and produce 79 000 MWh energy per year.

In 2006, "Yazaki" started operating in Bulgaria through its "Yazaki Bulgaria" division, which opened its own plant in Yambol. In the following years, two more manufacturing plants were built – in Sliven and Dimitrovgrad. These enterprises manufacture cable equipment intended for world leaders in the automobile market.

Zen-Noh foods, as part of Japan Agri Products Europe, built a factory in Plovdiv, which started operating in April 2018. The factory produces six types of frozen sushi. The products are intended for other European countries, and in the future partners and retail chains will be searched to distribute the sushi in Bulgaria. It is made from two types of fish – salmon and mackerel, which are imported respectively from Norway and Scotland.

AN Aqua Network Ltd. was founded on June 30th, 2017 with headquarters in Sofia, as a subsidiary of the Japanese SWATO Inc. The company offers individually designed treatment plants for public and industrial wastewater, as well as other products and services in the field of water treatment. The treatment plants of AN Aqua Network – "Asahi Jokaso", are manufactured at a factory in Bulgaria under strict quality control of the production processes and the end products. In addition to design and production, the activity includes also on-site delivery, commissioning, complete service and after-sales maintenance, as well as 24-hour real-time remote monitoring of the work of the built WWTPs.

In 2018, Pentax Medical opened a 3000 m^2 service centre in Plovdiv with a personnel of over 120 people.

In 2019, Japanese concern Ricoh became a shareholder in the Bulgarian software company "Nemetschek Bulgaria".

Japanese game developer SEGA expands its presence in Bulgaria with the opening of a new QA (quality assurance) studio. The company will relocate its unit from London, and the Sofia office is to open in June 2020. In 2017, SEGA purchased the Bulgarian gaming company Crytek Black Sea with a team of 60 developers.

3. Total investments of Japan in Bulgaria in the period 2014-2018

Available data on Japan's annual investments in Bulgaria show that the total volume of Japanese investments in Bulgaria in 2014 is 71 million EUR. In 2018 it decreased to 55.6 million EUR. Compared to other CEE countries, the amount of investments is 2-3 times smaller, weighted against the GDP of Bulgaria. Particularly alarming is the decrease in recent years. On the one hand, this part of the difference can be explained by the geographical factor, but for the other part, we believe there are opportunities for a more active policy to overcome this gap.

Table 3

Net foreign investments from Japan to Bulgaria – position at the end of the period (million EUR)

Period	Value
2014	71.0
2015	61.5
2016	57.1
2017	61.3
2018	55.6

Source: Bulgarian National Bank.

The review of the realized Japanese investments and projects in Bulgaria shows that Japan has a constant interest in our country. Initially, Japanese resources relate to state and parastatal funding and aim at solving pressing problems of the society. At a later stage, private investments in promising projects are realized, and public funding from Japan goes to large infrastructure projects. However, the scale and distribution of Japanese investments are relatively low. This does not correspond to the significantly improved investment environment that has existed in our country for the last 12-15 years.

V. PERSPECTIVE ECONOMIC SECTORS AND PRODUCTIONS FOR the JAPANESE INVESTMENTS IN BULGARIA

1. Economic sectors with a potential for Japanese investments

For identification of the opportunities for attracting Japanese investments in Bulgarian economic sectors is used methodology based on the approach of Yasumura (1996) to assess the potential for import/export.

The **first step** is to analyze outgoing direct investments from Japan by sectors. The goal is to outline the sectors and productions, from which those Japanese investments abroad most often originate. Companies that have already invested abroad in one or more countries are more likely to invest in Bulgaria as well, compared with companies that do not have the experience and capacity to invest abroad. The analysis includes also the number of

subsidiary companies abroad established by one Japanese parent company. It is argued that when a parent company invests in more than one subsidiary abroad, it is a criterion for internationalization and it is realistic to expect that it may invest in other countries as well, like Bulgaria.

The **second step** analyzes the structure of incoming foreign direct investment in Bulgaria by sectors. The goal is to assess in which sectors the country is of interest and competitive in attracting investments. The presence of foreign companies by sectors is also analyzed to determine which sectors have higher FDI absorption. Thus the potential for attracting investments by sectors is assessed.

The **third step** analyzes the points of intersection in sectors, where Japan has a potential and experience in investing abroad and Bulgaria is attractive for foreign direct investments in the respective type of production. The comparison of the two structures outlines the sectors and productions that have a high potential for attracting FDI from Japan.

To this list of potential sectors are added those where Bulgaria has not attracted investments but Japan does have experience in investing abroad. This would create a comfort for the potential Japanese investors as they will not have foreign competitors on the domestic market.

Outgoing direct investments from Japan to the world

The leading sectors by **outgoing foreign investments from Japan** are presented on Table 4.

Table 4

Outgoing foreign direct investments from Japan, 2017

Top 8 sectors by FDI in 2017	FDI in 2017 (million USD)	FDI – change to 2014 (%)	Parent companies	Subsidiary companies
Total for all sectors	1 494 648	9.10	4 420	17 937
Finance and insurance	307 798	12.80	129	464
Trade; repair of motor vehicles and motorcycles	205 734	8.60	1 420	4 660
Manufacture of motor vehicles and other transport equipment	125 688	6.10	899	2 217
Manufacture of food products, beverage and tobacco	82 814	5.70	230	464
Manufacture of basic metals and metal products	45 732	3.20	978	1 831
Construction	8 055	11.80	145	316
Manufacture of textiles and clothing; leather and more	7 891	9.70	777	1 322
Manufacture of coke, refined petroleum products and nuclear fuel	3 140	-11.30	171	301

Source: www.investmentmap.org.

As a whole, data show increasing investments from Japan abroad, with a 9.1% increase just in the three-year period. The sectors where Japanese companies invest abroad are: first is "Finance and Insurance" sector with about 307 billion USD in 2017, followed by "Trade; repair of motor vehicles and motorcycles" with 206 billion USD and "Manufacture of motor vehicles and other transport equipment" with 126 billion USD. "Manufacture of food products, beverage and tobacco" is also an important sector where Japanese companies invest abroad.

Regarding the change of investments compared to 2014 (column 2), the leading sector is again "Finance and Insurance", and its change compared to 2014 is the highest of the studied sectors – 12.8%. The second sector by increase in 2014-2017 is "Construction" with 11.8%. Third place is occupied by the sector "Manufacture of textiles and clothing; leather and more" with a change of 9.7%. Fourth place is for "Trade; repair of motor vehicles and motorcycles" with 8.6% change. The sectors following are "Manufacture of motor vehicles and other transport equipment", "Manufacture of food products, beverage and tobacco", "Manufacture of basic metals and metal products". The only sector with negative growth is the sector "Manufacture of coke, refined petroleum products and nuclear fuel".

Data on the number of subsidiaries abroad show that Japanese companies investing abroad are highly internationalized: on average, one parent company establishes over three subsidiaries abroad – most likely in several countries. This directs the focus precisely on these companies as potential investors in Bulgaria.

The largest number of Japanese companies invest abroad in trade and repair of motor vehicles – 1420 parent companies and 4660 subsidiaries, with one parent company establishing average over three enterprises abroad. Second in number of companies abroad is the manufacture of basic metals and metal products with 978 subsidiaries, and in this sector, one parent company establishes average two subsidiaries abroad. There are 899 companies investing in the manufacture of motor vehicles abroad, which have established 2217 subsidiaries abroad, i.e. an average of about three companies each, which shows a high degree of internationalization. Japanese companies invest also in textiles abroad – 777 parent companies and 1322 subsidiaries worldwide.

The average size of an investment in a subsidiary is an important indicator that gives an idea of the scale of the activities the Japanese companies do abroad. The data show that the average investments are most significant in the financial sector, while in trade and textiles they are relatively small.

Japan is on **second place** in the world after USA by investment potential abroad in the "Manufacture of food products, beverage and tobacco" sector[20]; on sixth place in the "Mining and quarrying" sector. In these sectors, Bulgaria has significant comparative advantages, which can be attracted to Japanese investments.

Japanese companies are actively investing abroad, and in most cases in more than one company (more than one country). There is a high possibility that an active policy

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[20] ITC Investment map.

might attract investments from Japan. The largest number of Japan's investments abroad is in the financial sector, followed by trade and manufacture of motor vehicles. For the purpose of attracting FDI from Japan, most realistic is to target exactly Japanese companies with experience in foreign investment.

Incoming investments in Bulgaria from abroad

Incoming FDI in Bulgaria are presented in Table 5.

Table 5

Incoming foreign direct investments in Bulgaria in 2017

Top sectors by FDI in 2017	FDI in 2017 (million EUR)	FDI – change from 2014 (%)
Total for all sectors	**42 492**	**13.5**
Finance and insurance	7 014	14.7
Trade; repair of motor vehicles and motorcycles	5 808	30.7
Production and supply of electricity and heat, gas distribution, water supply, sewerage, waste management	3 240	-1.0
Transport, storage and mail	2 101	209.5
Construction	1 411	24.4
Manufacture of rubber, plastic and other non-metallic mineral products	1 208	15.1
Manufacture of food products, beverages and tobacco	1 131	27.7
Manufacture of basic metals and metal products	953	3.9
Hotels and restaurants	681	9.0
Mining and quarrying	651	72.7
Manufacture of chemical products	648	12.7
Manufacture of machinery and equipment	436	37.7
Administrative and support activities	411	58.9
Manufacture of electrical equipment	404	42.2
Manufacture of wood, paper, paperboard and articles thereof (excluding furniture); printing activities	348	41.3
Manufacture of motor vehicles and other transport equipment	340	33.1
Manufacture of textiles and clothing; leather processing and more	256	0.4
Agriculture, forestry and fishing industries	158	56.7
Education	30	656.4
Human health and social work	12	95.2

Source: National Statistical Institute and Bulgarian National Bank.

As a whole, foreign direct investments in Bulgaria increase. As the data on Table 5 show, the leading sectors by incoming FDI in Bulgaria in 2017 (column 1) are: "Finance and insurance", "Trade; repair of motor vehicles and motorcycles", activities related to energy, water supply and sewerage, and gas distribution.

Although the financial sector has most foreign investments (about 75% of the assets in the banking system are controlled by foreign banks), it continues to attract the most

investments, their amount reaching nearly 7 billion EUR in 2017. Trade and repair of motor vehicles rank second by investments from abroad, taking into account the activity of the large foreign retail chains, which expand their sales network throughout the country. Manufacture of car parts increases in recent years.

In recent years, the highest growth in incoming investments is in the logistics sector – transport, storage and mail. The key geographical position of the country, as well as the competitive prices of the land, create conditions for large logistics and transport companies to establish businesses in the country.

Quarrying is also attractive, with 651 million USD invested by 2017, and for just three years the increase in investments is 72.7%. This indicates that the access to this sector is open to foreign companies.

Manufacture of chemical products is a traditional sector with predominantly foreign participation, with investments there increasing by almost 13% over the last three years. In the manufacture of machinery and equipment, the increase is by 37%.

The analysis shows that the Bulgarian economy is open to investments, and they are not concentrated just in few sectors but are well represented in all sectors of the economy.

Points of intersection of outgoing FDI from Japan and incoming FDI in Bulgaria

The structure of outgoing FDI from Japan shows the investment capacity in the different sectors, while the structure of incoming foreign investment in Bulgaria shows the attractiveness of the different sectors to investments in the country. The comparison between the two structures gives an opportunity to make a realistic assessment of **which sectors of the Bulgarian economy are most likely and possibly to attract foreign direct investments from Japan**.

The points of intersection of the leading positions in outgoing FDI from Japan and incoming FDI in Bulgaria are presented on Table 6.

Table 6

Points of intersection of leading positions in outgoing FDI from Japan and incoming FDI in Bulgaria, 2017

Sectors	Position in outgoing investments from Japan	Position in incoming investments in Bulgaria
Finance and insurance	1	1
Trade; repair of motor vehicles and motorcycles	2	2
Manufacture of motor vehicles and other transport equipment	3	16
Manufacture of food products, beverages and tobacco	4	7
Manufacture of basic metals and metal products	5	8
Construction	6	5
Manufacture of textiles and clothing; leather and more	7	17

Source: author's calculations.

32

Based on the comparison, the following opportunities are identified:

Finance and insurance. In terms of outgoing investment from Japan and incoming investments in Bulgaria, this sector is the most active concerning the volume of investments, which relates to the specificity of the sector and the high capital requirements. Bulgarian financial sector undergoes a period of consolidation, i.e. "green-field" investments in the financial sector at this stage are also less possible due to the decrease of the interest margins in recent years. At the same time, however, continuing mergers and acquisitions in the sector provide space for direct and indirect investments in the banking and non-banking sectors.

Trade; repair of motor vehicles and motorcycles. The data show a complete match in the importance of this sector for both Japanese investors and the Bulgarian economy, in both cases ranking it second in terms of investment volume. Investment expectations in this field relate to two separate sub-sectors – trade, and repair of motor vehicles and motorcycles.

Manufacture of food products, beverage and tobacco. This is a sector with high development potential in Bulgaria with the country's comparative advantages. It has a wide space for foreign investments and unused potential, mainly in terms of bioproducts based on traditional and unique raw materials. Here the foreign investments are less. The high reputation of Bulgarian dairy products in Japan can be more effectively capitalized in this area.

Manufacture of basic metals and metal products. In this sector, 978 Japanese companies invest abroad.

The other two leading sectors in Japan's outgoing investments rank lower in the ranking of incoming investments in Bulgaria. These are: **"Manufacture of motor vehicles and other transport equipment"** and **"Manufacture of textiles and clothing, leather and more"**.

Manufacture of motor vehicles and other transport equipment. The motor vehicle industry has generated revenues of 1 billion EUR from over 170 companies with more than 40 000 employees in the sector. Bulgaria is a main supplier of car parts for brands like Mercedes, BMW, Audi, Ford, Volvo, Peugeot, Renault and Dacia. Manufactured parts include upholstery, seats, cables, air conditioning and engine parts, microchips, rubber seals, windows, springs, electronics, filters, aluminium profiles, belts.

Among the largest manufacturers with the most production and created jobs in Bulgaria are Integrated Micro-Electronics Bulgaria, Montupet, Grammer, Teleclass and more. Japanese companies already have an important share in the sector in Bulgaria – Yazaki Bulgaria, Johnson Controls Electronics (of Sumitomo). Personnel for the sector is trained in secondary and higher education. A training centre for diagnostics of electric and conventional vehicles has been established at the "Henry Ford" Vocational High School of Transportation and Energy.

The outlined economic sectors, which are points of intersection between the leading positions in Japan's outgoing FDI and Bulgaria's incoming FDI, show where the opportunities to attract Japanese investments are.

2. Other perspective sectors with comparative advantages for Bulgaria

Information technology[21]

The software sector is rapidly developing, employing around 30 000 specialists, according to the softwarers association's data. GDP contribution is estimated by the association at close to 3%. The level of wages in the sector is the highest in the country and is comparable with the level in the other EU Member States. Recalculated through purchasing power parity, it exceeds some of the most developed European countries. Some of the main factors for the development of the industry are:

- Digitization of key industries: FinTech, Automotive, Medicine, etc.;

- Private and public IT education initiatives are entering a mature phase;

- Return of Bulgarians from abroad, reverse of the emigration trend;

- Development of regional centers;

- Working venture capital ecosystem;

- Qualification programs, including with European funds.

Raw materials processing

Raw materials account for about 40% of the structure of the Bulgarian exports by the way of utilization. The largest group is "Non-ferrous metals" with almost 10% of all commodity exports. On the second place are "Raw materials for manufacture of food products" with almost 7%, and on the third place is "Plastics and rubber" with 4%. The exported volumes reveal opportunities for directing FDI to their processing on the territory of Bulgaria.

thousand tons · RAW MATERIALS EXPORT, NET WEIGHT

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total	5 421	5 533	6 630	7 140	7 210	7 730	7 538	6 625	6 395	7 665	9 087	8 841	9 215	9 827	9 559	9 964	10 884	10 214	8 768
To Japan	3,9	3,3	2,3	2,3	1,9	5,5	6,8	1,7	1,2	1,8	1,9	3,4	4,6	4,6	4,9	4,6	5,9	4,1	3,2

⎯⎯⎯ Raw Materials Export from Bulgaria to Japan

⎯⎯⎯ Total Raw Material Export from Bulgaria

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[21] BASSCOM Barometer. (2019). Annual Report on the State of Software Sector in Bulgaria, December 2019.

Table 7

Total exports of raw materials from Bulgaria, net weight (thousand tons)

Raw Materials Type	2000-2009	2010-2019	2019
Kaolin and other kaolin clays, including calcinated	1309	2013	204
Refined copper and unprocessed copper alloys in	597	1920	146
Unrefined copper, copper anodes for electrolytic refining	1454	983	81
Raw lead	675	751	68
Other clays, andalusite, kyanite, silymanite, including calcinated, mulit, chamotte or dinas soil	1308	716	33
Raw zinc	807	654	58
Marble, travertine, seashells and other limestone	320	450	47
Natural barium sulphate (barite); natural barium carbonate (witherite), decalcified	803	334	67
Aluminium rods and profiles	101	286	35
Aluminum waste and scrap	220	265	29
Copper waste and scrap	100	108	10
Raw aluminium	51	70	7
Granite, porphyry, basalt, sandstone and other stones	95	68	7
Shale, shale dust and shale debris	18	45	4
Copper stone, copper sludge	42	37	2

Source: National Statistical Institute.

Export of raw materials to Japan

Raw materials account for nearly 35% of Bulgaria's exports to Japan in 2019, and according to the National Statistical Institute data, they have increased by almost 3 times in the last 15 years.

Source: National Statistical Institute.

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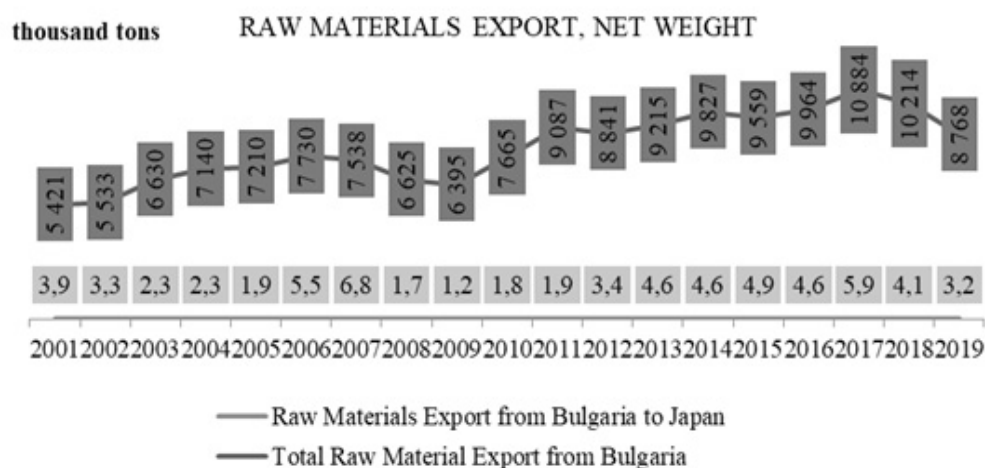
Table 8

Products with highest exports to Japan (tons)

	2019	2000-2009	2010-2019
Kaolin and other kaolin clays, including calcined	1746	–	25015
Mollusca, including in shell, live, fresh, chilled, frozen, dried, salted or in brine; smoked;	357	6 289	3873
Shaving and bath products, body deodorants, depilatory products, perfumery, toilet and cosmetic pproducts	228	6	236
Granite, porphyry, basalt, sandstone and other stones used in monuments or construction	166	0	1160
Sunflower seeds, including crashed	147	346	873
Vegetables, dried, sliced or pieces, ground or in powder	109	1068	1042
Natural honey	102	143	426
Skins and other parts of birds covered with feathers or fluff, feathers and parts of feathers, fluff	94	–	361
Essential oils; resinoids; extracted oleoresins; concentrated solutions	71	537	836
Slate, including roughly trimmed or merely cut; shale dust	58	–	255
Chocolate and other food products containing cocoa	21	18	181
Oilseeds and fruits (excluding nuts, olives, peanuts, soya beans, dill, flax, rape, sunflower)	15	128	87
Plants, parts of plants, seeds and fruits used mainly in perfumery, medicine, for insects destruction	6	155	191

Source: National Statistical Institute.

Raw materials account for just over half of Bulgaria's total exports to Japan for the last 19 years till 2019 including. In the years following the 2008 crisis, these exports vary between 1500 and 2000 tons on average per year, and increase to around 5000-6000 tons in the period 2013-2017. In the last two years until 2019 including, there is a drop in the volume and value of exported products to Japan, as well as in the share of raw materials in them.

Among the ten raw materials with the largest and most sustainable volume of exports from Bulgaria to Japan are **kaolin, granite, mollusca, sunflower seeds, dried vegetables, natural honey and bird skins**. Kaolin has been exported to Japan since 2010, as well as granite, while other raw materials for food products have a significant sustainable export share since 2000.

Over the last ten years, there has been an increase in demand mainly for bird skins and other parts of birds, essential oils, crustacea, mollusca and other aquatic invertebrates, wine and grape juice, dried vegetables, natural honey, fruits, nuts, sunflower seeds, and kaolin. The other products are an insignificant part in exports.

Opportunities for Japanese investments in the raw materials processing

Opportunities for Japanese investments in Bulgaria, **related to the realized export of raw materials** and increased demand from Japan, exist in:

- Manufacture of end products from skins and other parts of birds;

- Manufacture of end food products from crustacea, mollusca;

- Processing of essential oils in the end cosmetic products;

- Manufacture of sunflower oil and butter from sunflower, saffron or cotton.

IMPORTS & EXPORTS FROM/TO THIRD COUNTRIES, 2018,
THOUSAND EURO
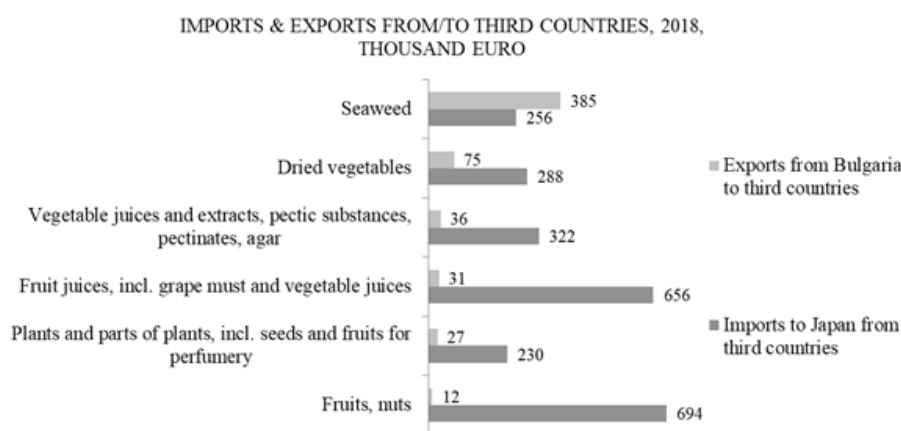
Source: UN COMTRADE.

Other investment opportunities exist also in the processing of raw materials, for which **Japan realizes sustainable imports from other countries**, and Bulgaria exports steadily to third countries, but the two countries do not have commodity exchange, or there is an opportunity for larger quantities. Such are, for example, seaweeds, dried vegetables, vegetable juices, extracts, fruit juices, plants and parts of plants for perfumery, and fruits and nuts.

The review of the export structure of raw materials in the total exports, including to Japan, shows that there is a good premise for investment interest in positioning relevant processing productions in Bulgaria with medium and high added value of the end product.

Waste processing

Waste processing is an area where Bulgaria is lagging behind on its national goals and needs investors with technological advantages. Attracting foreign investors in this area may require a faster overcoming of difficulties, both with the changes to the regulatory

framework of the domestic market and with the rapid introduction of technologically innovative solutions and achieving the unfulfilled goals.

The total amount of waste generated in Bulgaria in 2017 (excluding from "Plant-growing, stock-breeding and hunting"; "Supporting activities"; "Forestry"; "Fish industry", "Mining") is 20 693 kilotons (including hazardous, non-hazardous and domestic).
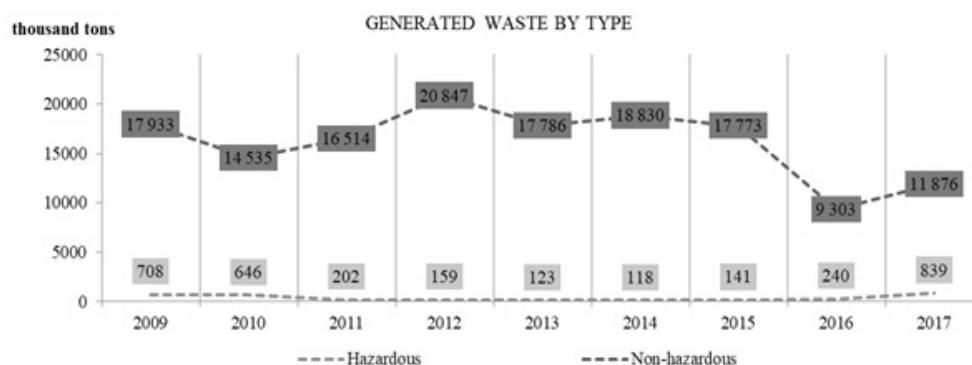
Source: Ministry of Environment and Water.

Source: Eurostat.

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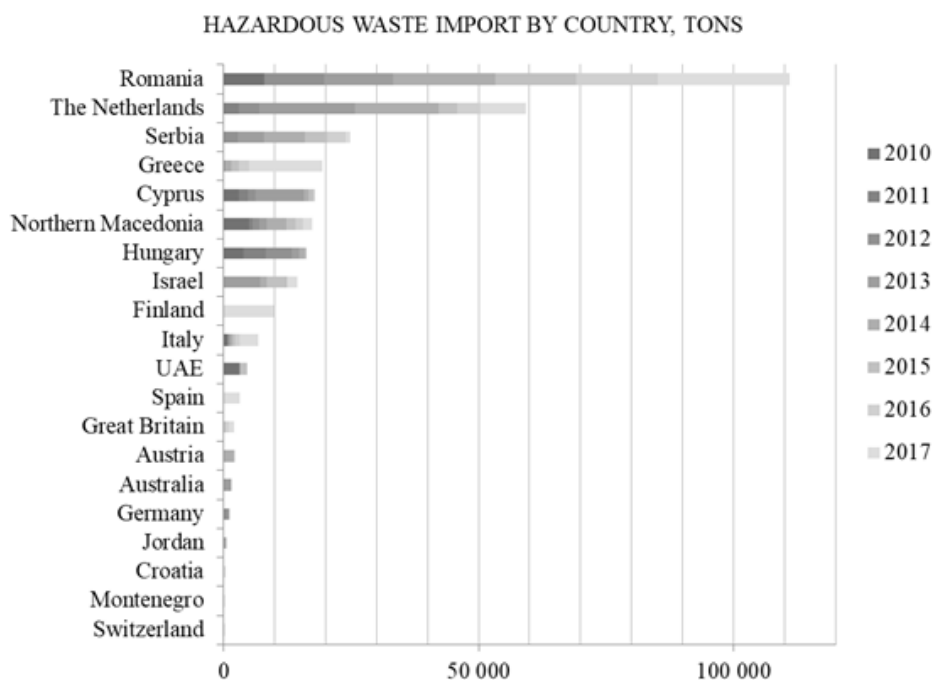
At the same time, in Bulgaria, there is a tendency of increase of import of hazardous waste in the last 6-7 years, and especially in 2017, when it reaches 72 kilotons, more than 5.4 times bigger than the one generated in the country. The largest share of imports of hazardous waste is from Romania, followed by the Netherlands and our neighbouring countries – Serbia, Greece, Cyprus, Northern Macedonia. In 2017, the import of hazardous waste is 72 kilotons, with an average annual 13 kilotons generated in the country in the period 2010-2016.

IMPORT AND EXPORT OF HAZARDOUS WASTE, THOUSAND TONS

Source: Eurostat.

RECYCLED WASTE RATE IN BULGARIA, %

Source: National Statistical Institute.

Our country has not reached the national goal of 40% recycling of the domestic waste in 2017, stipulated in the legislation (§15 of the Transitional and Final Provisions, Waste Management Act, promulgated SG No. 53 dated 13.07.2012).

Waste management remains a challenge for Bulgaria, although the produced waste is below the EU average. According to the EC "Early Warning Report" (2018), Bulgaria is at risk of not reaching the goal of recycling 50% of its waste in 2020. In 2017, this rate was 35%, compared to an EU average of 46%.

One of the main reasons for the low percentage is the lack of separate collection of non-metallic waste, as well as the competition between official and unofficial collection systems. The unregulated schemes for promoting separate collection for both recycling companies and citizens do not allow free growth of investments in this sector.

Energy production from waste biomass

Due to its favourable geographical position, Bulgaria has plentiful resources for energy from renewable sources, including biomass. Experts estimate that the biomass energy potential is around 3400 MW in total.

Apart from the traditional heating biomass "firewood", which now creates a number of problems with the protection of air purity in the winter due to the massive consumption caused by the expanding energy poverty in the country, the unconventional biomass resources from agriculture and industry have not yet been fully utilized. The processing of these resources into electricity and heat, or pellets for home use, meets a number of strategic and regulatory documents in this field.

Expert assessment of the Executive Environment Agency concerning the volume of industrial wood waste from the wood-working, wood-processing and furniture industries, and concerning the theoretical potential of this waste wood biomass for energy production, as well as its energy equivalent, shows a **serious theoretical potential of these wood waste**, respectively: average volume of industrial wood waste 856 119 m^3/year, with an energy equivalent of 244 300 tons/year, of which 48.9% or 119 400 t.n.e. coniferous wood waste and 51.1% or 124 900 t.n.e. deciduous industrial wood waste.

According to NSI data, the average annual production of the two types of industrial wood waste amounts to about 43 000 tons, grouped in two product codes – wood shavings and flour (sawdust and bran), and wood chips and particles.

Table 9

Amount of biomass from a crop

Type of crop	Planted areas, decares	Average yield per decare	The amount of biomass produced, tons
Wheat and barley	14010	400	5604
Maize	28750	734	21102
Sunflower seeds	10270	250	2567
Cane	17918	540	9676
Total			**38950**

Table 10

Energy equivalent of the technical potential

Indicators	Coniferous wood	Deciduous wood	Total
Annual average amount of industrial waste from processing of large wood, m³/g	241848	135631	377479
Average volumetric content of dry mass, t/m³	0.45	0.65	–
Amount of dry mass, t/year	108832	88160	196992
Amount of work mass (40% absolute humidity), t/y	181387	146933	328320
Lower combustion heat, GJ/t	10.54	10.42	–
Energy equivalent, GJ/year	1911819	1531042	3442861
Energy equivalent, t.n.e./year	45663	36568	82231
Rounded value of energy equivalent, t.n.e./year	45700	36600	82300
Industrial waste from processed wood			
Average annual amount of industrial waste from process wood, m³/year	260378	218262	478640
Average volumetric content of dry mass, t/m³	0.45	0.65	–
Amount of dry mass, t/year	117170	141870	259040
Amount of work mass (60% absolute humidity) t/year	292925	354675	647600
Lower combustion heat, GJ/t	10.54	10.42	
Energy equivalent, GJ/year	3087432	3695714	6783146
Energy equivalent, t.n.e./year	73742	88271	162013
Rounded value of the energy equivalent, t.n.e./year	73700	88300	162000
Total value of energy equivalent, t.n.e/year of industrial waste from processed wood	119400	124900	244300

Source: Ministry of Environment and Water, National Action Plan for Forest Biomass Energy 2018-2023.

Manufacture of electric motors for bicycles

Bulgaria is one of the largest manufacturers of bicycles for the European market, with a production of over 1 million bicycles per year, by 2018. There are 5 factories of 4 manufacturers located here, namely Leader 96, Cross, Maxcom, BalkanVelo, with a long history on the market. Over 60-70% of the production in Bulgaria is for export to the European market, mainly to Germany, the Netherlands, France, Italy, Austria, Switzerland, Denmark and others.

As demand for electric bicycles increases, factories are planning to produce more and more of them. Leader 96 plans to produce 100 000 electric bicycles in 2020.

Much of the bicycle components are purchased from Asia, and electric motors for the bicycles are purchased mainly from the Japanese company Shimano. These components are imported from Japan and are used not only by Bulgarian manufacturers but also by European ones. According to the local manufacturers, their competitors in Europe also buy electric motors from Japan.

BICYCLES PRODUCTION IN BULGARIA, THOUSAND UNITS

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	516	562	458	532	642	837	749	950	940	948

Source: Statista.

BICYCLES SALES IN EU-28, THOUSAND UNITS

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	21 344	20 206	19 582	20 461	20 039	19 719	19 780	20 340	20 633	19 606
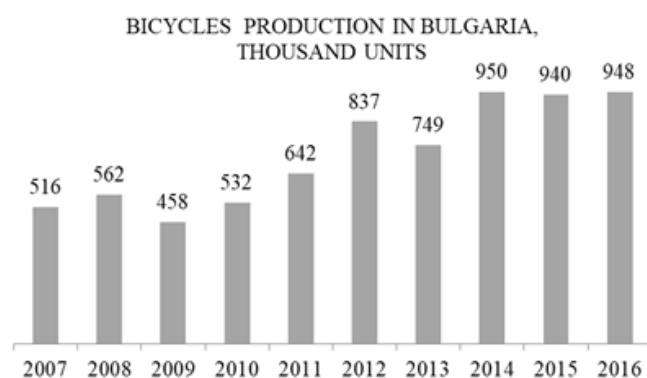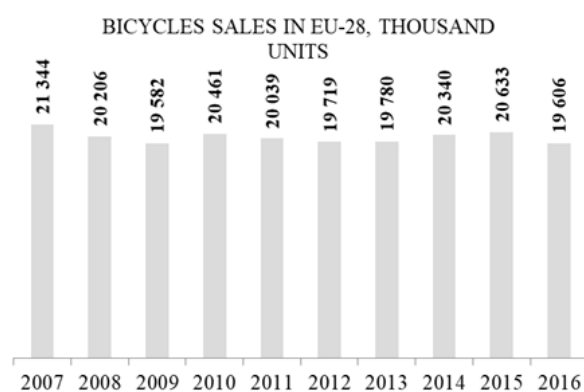
Source: Companies' websites.

BICYCLES PRODUCTION CAPACITY BY MANUFACTURER, 2019, UNITS

Maxcom	Leader 96	Cross
500 000	400 000	250 000
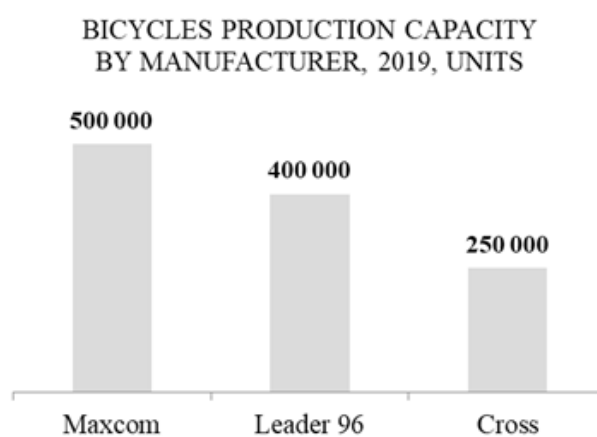
Source: Statista.

Localization of the production of bicycle electric motors for the European market would be of interest not only to Bulgaria and Japan, but also to the whole European market, with the expectation of shortening the delivery time and consequently the cost. Given that the manufacture of bicycles is a labour-intensive industry, Bulgaria has a comparative advantage.

Green Economy

The adoption of the European Green Deal in December 2019 sets new goals for a sustainable economy in all EU Member States and requires significant investments in eco-innovation in a number of sectors – transport, energy, agriculture, construction, and industries such as steel, cement, ICT, textile and chemicals.

Given the higher goals for emission reduction, decarbonisation of energy and eco-innovations in each area, our country will be favoured and will have additional funding. Expected is the creation of a billion-dollar fund, and companies that will invest in a green economy, local and foreign, will also be able to benefit from co-financing from this fund.

Bulgaria lags behind in its eco-innovation index, which is slightly below 39 in 2017, ranking last, with average 100 in EU-28, and average 140 in countries like Sweden, Finland, Luxembourg, Germany.

ECO-INNOVATION INDEX, 2017 (EU-28 = 100)
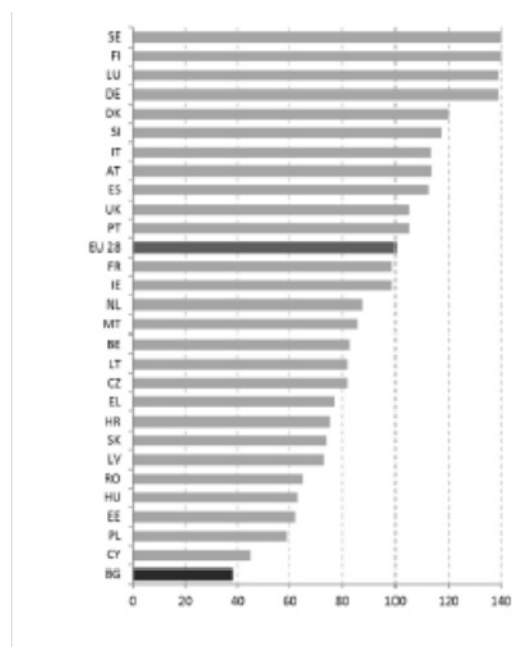
3. Projects with potential for Japanese investments from national program documents

Considering Japan's past interests in Bulgaria, several strategic projects are selected that could now be of interest for financing and involvement of Japanese companies in their implementation. These projects are included in adopted strategic documents in the energy, transport and ecology sectors. There is no ensured financing for them from European structural funds and Cohesion Fund, but they rely on other funding. The projects are in a different stage of readiness for project implementation, so some of them have estimates of their value, while others do not.

Projects in the Energy sector

- Expansion of "Chaira" Pumped-Storage Hydroelectric Power Station with "Yadenitsa" Dam;

- Expansion of the Chiren underground gas storage;

- Construction of a new gas storage facility connected to the existing gas network in Bulgaria.

Projects in the Transport sector

- Construction of "Black Sea" highway between Burgas and Varna;

- Construction of Ruse – Veliko Tarnovo expressway from km 0 to km 110, part of the trans-European corridor 9 – 400 million EUR;

- Construction of tunnel under Shipka – 125 million USD;

- Modernization of Karnobat-Sindel railway line (up to 130 km/h) – 200 million EUR;

- Restoration of Ruse-Varna railway line – 300 million EUR;

- Construction of intermodal terminal in Ruse.

Projects in the Ecology sector

- Closure and recultivation of municipal depots that do not meet the current environmental requirements.

MACROECONOMIC, REGULATORY, EXPORT, AND PRODUCTION FACTORS, PRESENTED IN THIS EXPERT REPORT, SHOW THE SERIOUS PREMISES FOR JAPAN'S INVESTMENT INTEREST IN BULGARIA.

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Rossitsa Rangelova[1]

ETHICAL INFRASTRUCTURE IN THE POST-SOCIALIST BULGARIA[2]

The article analyzes the emergence and development of business ethics in Bulgaria from 1989 to the present day, that is, it traces the emergence of ethical infrastructure in the conditions of transition from a centrally planned to a market economy and its development already in the conditions of the country's membership in the EU. The period of the last 30 years is divided into three sub-periods: (a) the collapse of state socialism and the launching of a market economy and democratic principles (1989-1997); (b) the period of deeper structural reforms and the preparation of the economy for EU accession (1997-2007); (c) the years of Bulgaria's EU membership (since 2007 up to now). The research deals with main problems of building ethical infrastructure – at the beginning of the period the ownership change – restitution, privatization, etc., and later on – legislation, freedom of speech, shadow economy, corruption and more are studied. The issues discussed herein are complemented by the results of the surveys conducted in 1996 and 2019. The questions of established business ethics in Bulgaria are posed in the context of the challenges facing the society of this still transforming country.
JEL: H11; J38; J68; P16

Introduction

Post-socialist societies in Central and Eastern Europe (CEE), among which is Bulgaria, have undergone radical changes since the collapse of the former socialist system of centrally planned economies (1989). A fundamental issue for these economies was the change in the political and economic system and the transition to democracy and a market economy in accordance with European Union (EU) norms leading to the CEE countries' subsequent accession. This required the efforts of societies in these countries to develop new political and economic institutions that meet the requirements of today's market conditions and democracy. The emerging managers of companies and companies had to respond adequately to the rapid changes in the market and its environment, to the

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privatization of former state-owned enterprises, to competition and relations with the state and its institutions, the impact of foreign direct investment (FDI) and the effects of financial the 2008 crisis and beyond.

As for business ethics, society had to radically change its moral values. While socialist ethics were characterized by the preference for collective interest, most notably an egalitarian system of remuneration, on the principle of "socialist solidarity", subordinated to equality, etc., the new market environment required a completely different ethic: economic efficiency based on rational behaviour, adaptability, entrepreneurial spirit, personal responsibility and liberal solidarity, subordinate to freedom.

Despite the established ethical environment, the political, economic and social systems in Bulgaria today still face significant challenges with regard to the establishment of ethical infrastructure in the market and business ethics in public relations. There are still many niches and inconsistencies in legal and other systems and many people are tempted to use them. In many cases, lack of experience or just ignorance is bad for existing business practices. Moreover, there is a well-known legacy of the previous system that can be difficult to overcome. In this context, the present study is useful and it outlines the challenges facing building a better ethical climate in the country.

The article has the following structure. *The first part* analyzes the main characteristics of economic and political changes in the country in the field of legislation and institutions during the transition in the first sub-period. These changes were a prerequisite for the creation of a new ethical culture of society, starting with the change of ownership through restitution and privatization, establishment of appropriate institutions, etc. Based on a survey (1996), empirical findings for emerging ethics and business culture in Bulgaria are presented. *The second part* analyzes the economic and political changes in the second and third sub-periods – efforts to build a stable market economy and democratic principles with a view to joining the EU and then years of EU membership as a medium to shape the current business environment. Some aspects of business ethics are discussed, in particular: government, development of business-state relations, changes in business freedom, implementation of European directives and relationships, shadow economy, corruption, media freedom, etc. Based on a partial survey (2019), an attempt was made to trace the change in the ethical evaluation compared to the one considered in the first sub-period. Finally, conclusions are given, outlining the challenges facing Bulgaria in terms of business ethics.

1. Specificity of the radical change in the ethics of Bulgarian society

- The paternalistic approach used in the 4-5 decades of state socialism preceding 1989, was through controlling and solving all problems, with citizens not being widely involved in decision-making. That is why a certain lack of individual responsibility has remained in society's' collective mindset and this is a real barrier to renewing and improving the ethical climate in the country. Even today, it is noticeable that society is not used to asserting its rights.

- The illusions of conflict-free situations had to be overcome. The public need to realize that a market society exists in a competitive environment, which means emerging conflicts of interest and more or less interpersonal antagonisms that cause the individual to do his or her best. Emerging dilemmas must be addressed through dialogue, communication, mutual understanding and consensus.

- Because of their daily needs, people are just trying to make a living. For most of them, ethical considerations are second to none, or something like "extra" to what is seen as immediate issues.

- People live in a reality where injustice and aggression often win and dominate right and moral behaviour. Due to the high level of crime, in many cases, people are simply afraid for their lives.

- Probably partly because of past experience, and more so because of the experience gained over the last 30 years, people are very distrustful of claims to promote ethical behaviour through institutional means. As for the value of personal responsibility, it is still underdeveloped.

- It is known that if economic life is governed by the uncontrolled, informal personal relationships establishing illusory regulations, as well as lack of transparency, it seems justifiable for entrepreneurs to take into account only their close personal interest.

- In Bulgaria, the values "equality" and "social justice" are still considered more important than the values "freedom" and "personal enterprise". This is probably due not only to the inheritance of state socialism in the country, but also to the fact that the country was and still is today the one with the lowest incomes compared to other EU countries, with the highest risk of poverty and with the biggest difference in income.

At the beginning of the last 30-year period, it was logical to assume that most of the wrong practices that occur are temporary and will gradually disappear, or at least their effect will weaken, first through better laws. Most people presumed that many of the problems mentioned could be reduced by increasing the efficiency of economies and the integration of post-communist countries in the modern world. There are indications that many who, then and now, are blinded by market behaviour and efforts to turn to Western consumption standards will begin to appreciate such concepts as business ethics, corporate social responsibility and responsiveness as they enter a narrow contact with today's global market economy (Bohata, 1997, pp. 1571-1577).

2. The early transition in Bulgaria as a prerequisite for laying the foundations of the new ethical infrastructure

Already in the first few years after 1989, decisive steps were taken in the political and economic change of the system, especially in the field of institutions and legislation, one of the most important achievements being the beginning of the restoration of private property. The wrong course of reforms in Bulgaria in its transition to a market economy is well known. There was an abundance of publications on the economic transition in the 1990s

and later by authors and institutions in the country as well as by foreign authors and international organizations.

The adoption of entirely new ethical principles and culture by Bulgarian society came under very difficult initial conditions (Rangelova, 1997, p. 220-229).[3] In the late 1980s, the country was in the following situation: an over-centralized system of management with almost entirely state ownership of production assets, large disproportions, inefficient production structure and uncompetitive production for foreign markets, irrational employment structure, significant external debt and budgetary deficit, strong attachment to the markets of the former socialist countries, most notably Russia, etc. The roots of the deep crisis and the slow recovery of the country's economy can be traced to three main *internal reasons*: (a) the too unfavourable initial conditions for the transition to a highly centralized country's market economy; (b) poorly thought-out reforms in the early 1990s, inconsistent and slow implementation, frequent changes to enacted laws and long delays in substantive structural reforms; (c) political instability and mismanagement. Added to this is the negative influence of *external factors* such as the conflicts in the former Yugoslavia, the loss of markets in the East, etc.

As a result, during the first 4 years of transition, the country went into an acute crisis. GDP fell by one-third, industrial production fell by one-half as much as agriculture (55%). On the other hand, the changing reform philosophy implemented by different governments over time (seven in the first seven years) and three parliaments has created additional difficulties. Limited external financing and slow, inconsistent structural reform, or more precisely imitation of reforms, hindered macroeconomic stabilization. Nearly seven years after the transition began, Bulgaria's economy was still at a crucial stage, that means a significant slowdown in production, employment and investment, liquidation or reduction of a number of branches, industries and activities.

In 1996 a new deterioration of the Bulgarian economy was observed. Along with these negative phenomena, new ones emerged: the collapse of the banking system, the crisis of confidence in the banking sector, the cereal crisis. GDP has fallen by almost 10% since 1995. At the end of the year, the economy was very close to hyperinflation. In early 1997, the nation was actually facing poverty. The parliament was dissolved and the interim government appointed by the President of the Republic of Bulgaria started working to overcome the chaos in the country. From the point of view of the social climate, it is important that for the first time the authorities met the firm reaction of civil society through protests, demanding better governance and an improved standard of living.

Throughout this period, there was a lack of consensus among the legislative, executive and the judiciary, in particular among the main institutions: Parliament, the Presidency and the Government. The controversy spread widely and even reached the high circles of the Bulgarian official Orthodox Church, which led to two central management bodies. A more comprehensive analysis could explain this phenomenon through the painful struggle

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[3] This publication reflects the emergence of ethical infrastructure in the initial phase of transition from a centrally planned to a market economy in Bulgaria (1989-1997). The current study is a continuation of the period of development of business ethics in this country to the present day and upgrading some ideas, as well as correcting the views expressed in the beginning.

between new and old ways of thinking, as well as with the specifics of political and social life, including stronger personal economic than political interests. At that time, the political elite in the country dominated the economic elite.

Concerning the banking system, Bulgaria was a good example of the widespread practice of unsecured loans and the so-called credit millionaires. In addition, banks with bad credit portfolio were maintained viable through easy refinancing from the central bank. On the other hand, there was mismanagement of commercial banks, professional incompetence, even criminal acts. Banks did not exercise control over capital expenditures and did not disclose their real status, especially capital accountability. State banks neglected the requirements for credit guarantees providing unsecured loans. There was a funny example where a carp in a dam was used as a bank guarantee. This practice led to the collapse of the banking system and therefore to a crisis of confidence in the banking sector (Rangelova, 1999). In 1997, the country went through a severe economic crisis and the IMF introduced a currency board arrangement.

Experience shows that radical political transitions are usually accompanied by an increase in corruption, crime and instability, and sometimes there is a complete breakdown in law and order (Argandoña, 1996). This also happened with the change of the centrally planned with the market economy in Bulgaria, when for a certain period there was neither plan nor market. In other words, the restrictions imposed so far by the laws and sanctions of the past economic and political system do not work, but there are no established moral standards to replace them and guarantee the proper functioning of the economy and civil society. Under these conditions, the hidden economy is booming (estimated at around 30-40% in individual sectors of GDP). The basic rules for the functioning of a market economy are violated by the enormous tax evasion, by the disproportionate profit margin of some monopolists or dominant producers, by the misuse of information obtained while working for personal gain. Not only managers, but also often ordinary employees find it normal to take care of their private companies' business during their public service hours. Corruption and distrust are widespread in practice. Financial machinations and "contracted" auctions, in many cases involving foreign capital, are increasing. Domestic and foreign illegal cash found its way through "money laundry" schemes. Professional thefts (such as antiques) take place under someones ordered. Critics of the transition define it as criminal. People feel more aggression or fear than a desire to cooperate in social relations. In these circumstances, entrepreneurs cannot be expected to be inclined to assume social responsibility.

3. Ethics of restitution and privatization

The paramount role and the enormous importance of appropriate institutions for building an ethical infrastructure of a market society are aware of. But "no institution in the non-socialist world can be compared to the importance of private property and its practice. No institution has ever been such a source of social, economic and political discord" (Galbraigth, 1996, p. 29). For this reason, change of ownership was a key element in the transformation of a centrally planned system to a market economy. From an ethical point of

view, however, this issue is very important because it lays the foundations for future market relations, showing the image and nature of new economic agents.

In theory, restitution and privatization are treated as separate but related concepts. Nevertheless, while restitution affects justice, privatization is about restructuring corporate governance, improving microeconomic efficiency, and thus of macroeconomic well-being. In principle, restitution of former owners can only be justified on utilitarian grounds if there is evidence that former property owners or their heirs are better creators of wealth, but most often, there is no evidence of this. However, restitution is a rather weak principle in modern legal systems.

We share the view that restitution is a morally questionable principle for putting a political and economic system in transition. In the conditions of Bulgaria in the first years of the transition, its implementation was waste of considerable energy and time, which would otherwise be more useful for other reforms and for the success of the whole transition. However, restitution cannot satisfy all groups in society. It has more disadvantages than advantages, as was observed in Bulgaria. In practice, it reduces efficiency and creates conflicts. From a rational point of view, restitution is meaningless, but issues of justice, dignity, historical rights even play a role and are political. Given that political conditions dictated restitution, it had to be done.

The initial restitution and privatization process in Bulgaria has some features that we would like to briefly comment from an ethics point of view.

One of the laws voted by Parliament with priority in the early 1990s is the Real Estate (Restitution) Act. It affects about 2-3% of mostly urban people in their 70s. Some of them get high rents from their property; some have made it to their heirs one way or another. On the other hand, property restitution requires the creation of clear ownership of the assets, which is one of the reasons for the considerable delay in privatization. Either way, the ultimate social and economic impact of restitution remains unclear.

In all CEE countries, which were transitioning to a market economy then, a mix of different privatization methods and techniques (techniques) reflecting different ethical principles could be seen. The Czech Republic and Hungary, for example, are taking more or less pragmatic ways of privatization. We can hardly say the same about Bulgaria.

According to a number of sociological surveys conducted in the early 1990s, the majority of the Bulgarian population expresses a negative attitude towards privatization or unwillingness to participate in this process. Due mainly to political motivation, mass privatization techniques have not long been accepted as a form of ownership transformation due to the nature of property redistribution. It was not until 1996 that the process of mass privatization in the country began, which continued under different circumstances and ended with unclear results.

At the beginning of the transition to a market economy, the emergence of the private sector in Bulgaria, in particular the rapid increase in the number of small companies, was the result of the abolition of the state-owned monopoly, the over-concentration of production, and the spontaneous reaction of people to the process of social and economic democratization. Emerging entrepreneurs took the private initiative as a challenge, a way of

survival, a way to make good money. After several years of experience, many of them felt and realized themselves as agents of market relations. A comparative study of small firms (excluding firms in the agricultural sector) in Bulgaria, Slovenia and Hungary was dedicated to these problems, including ones related to ethical perceptions.[4]

The starting points at the beginning of the land return were laid down in the basic specifics of the Land Reform and Land Use Act. According to him, the land has to be restored within the so-called real limits, ie. everyone was to receive the same land owned by him or his heirs immediately before the collectivization of land in Bulgaria in 1946. This law was final as a solution and difficult to implement compared to the reforms undertaken in other CEE countries – Poland, Hungary, Czech Republic and others. This good intention in terms of fairness has in practice created enormous difficulties in its implementation. Given the dynamic social mobility of cities over the preceding 4-5 decades, many people have had to obtain land and assets that they cannot actually use. Much of the land and a large proportion of the former collective assets go to people who are no longer active or not engaged in agricultural production at all. The practical solution to the problem was to rent the land to others. The question arose however, why should land privatized by farmers be privatized so that non-farmers only can obtain it for the sake of letting it to former farmers? No wonder the former leaders of the cooperatives during the socialism (TKZS) became the new entrepreneurs (kulaks) in the villages. They knew how and managed to privatize the cooperative assets almost free of charge, as well as to have contacts with companies in the food industry.

As for the privatization of state-owned enterprises in Bulgaria, as well as in other CEE countries, investment (privatization) funds were used. There are questions about the nature of these funds, especially when compared to well-known institutional investors (mutual funds) in the Western capital markets. From an ethical point of view, for example, the question is what is the distribution of economic power in these new privatization funds in Bulgaria? The first ten and largest funds, created mainly by state financial institutions in 1996, had a book value of capital equal to that of the other 70 privatization funds as a whole. It was doubtful whether this was the right way to privatize through these gigantic institutions, because they were inexperienced and unprepared to create effective governance structures. In doing so, privatization had to take place over several years (the faster, the better).

Summarizing, one can ask: who are the new Bulgarian entrepreneurs? The answer is similar to that for the newly emerged then Czech entrepreneurs: small privatization (tenders) became a major goal for participants in the shadow (irregular) economy, while large-scale privatization favoured the "nomenclature". The latter have taken advantage of the exceptional opportunity to spontaneously privatize the assets of state-owned companies that

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[4] The survey for Bulgaria included 400 small companies (employing between 2 and 50 people, or an average of 12 people), located approximately 90% of the country's territory. The majority of respondents are owners, with about 90% of them being founders of companies. See Bartlett, Rangelova, 1996, p. 66-79; Bartlett, Rangelova, 1997, pp. 231-248.

are in the agony of privatization ("Society and Economy in Central and Eastern Europe", 1994).

4. Business ethics over the last two decades, including Bulgaria's EU membership

Following the adoption of the currency board in 1997, Bulgaria accelerated reforms on the path to building a market economy, stabilizing the financial and monetary system, taking decisive steps towards privatization of state-owned property (through the sale of strategic sites and the creation of worker-management companies), completion of land return, establishment of political and economic institutions, etc. With the adoption of the Treaty of Accession to the EU, the harmonization of legislation with that of the Union and the requirements of the modern market economy and democracy began to fulfil. Significant successes were achieved in the first decade of the new century. As a result of the reformed economy, FDI inflows, expansion of economic ties with EU countries, and others the country achieved rapid economic growth of around 5.5-6% annually until the crisis in 2008, converging to the average level of development in EU countries.

However, the existing political, economic and social systems in Bulgaria were old and new business ethics problems emerged, which are today's challenges related to building an ethical infrastructure on the market. Some of them are considered below.

The current situation in **the banking sector** is in line with the requirements imposed by the ECB in the EU. The presence of foreign (from EU) subsidiaries in Bulgaria, which hold about 72% of the total assets of the banking system, compared to about 22% of local banks, is characteristic. This limits political interference in this sector, but there are exceptions. However, it is difficult to maintain confidence in the banking system, even in currency board terms. Corporate governance in the banking sector needs to be better adapted to current legislation and the requirements of current European and world practice. For example, it is unacceptable to change the terms unilaterally by a bank in a contract already signed. Part of this process is the forthcoming entry of Bulgaria into the Banking Union and further into the Eurozone. The keywords for improving business ethics in the banking sector are transparency, qualified staff, good professionals, etc. (Rangelova, R., 1999).

The judicial system in Bulgaria has a very low-efficiency ratio. Interactions between prosecutors, judiciary and the police are ineffective, which is often mentioned in the EC's recommendations to Bulgaria's policy. The totalitarian nature of the prosecutor's office to control the entire country is enshrined in the Constitution of the Republic of Bulgaria of 1991. The unreformed judicial system has for years prevented Bulgaria from being accepted within the Schengen borders and into the European monetary mechanism. There is a sense of lack of the rule of law among the society.[5]

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[5] These data are confirmed in the Global Competitiveness Report (2019) at the Davos World Economic Forum. According to the indicator "Protection of property rights and intellectual property" Bulgaria is in 101st place, and in the "Organized crime" – in 111th place. Bulgaria's assessments of the efficiency of the judicial system, the reliability of the police system and the regulation of the economy are also too low.

Bulgaria and Romania acceded to the European Union on January 1st, 2007, under the conditions to continued reforms in the area of justice and the rule of law. The compromise was reinforced by a special monitoring mechanism called Mechanism for Cooperation and Verification (MCV). It is an instrument for influencing and continuing the work of the country in eliminating the imperfections of the court and the prosecutor's office, the fight against corruption and organized crime. On it, the European Commission monitors several points and makes recommendations. Each year the EC presents a summary report in July and an interim one at the beginning of the year. For 12 years, both the indicators and the political tone have changed, and with the impetus for change at the beginning, this instrument has proven to have no real impact. On the one hand, the Bulgarian institutions, dominated by the GERB government, with constant tricks, manage to circumvent the implementation of the recommendations. On the other hand, the European institutions, dominated by the GERB partners – the European People's Party – invent in the EC periodic reports on the state of Bulgarian justice an increasingly delicate statement to indicate the lack of progress.

It is encouraging for improving ethics that since the early 1990s young people in Bulgaria have been educated in the social sciences (economics, law, sociology, etc.) about market economy conditions and democratic principles. Since the mid-1990s, the discipline of business ethics has been introduced into the prevailing share of schools and many universities. Banking education, also education in finance and credit at the university is also widespread in high school. Postgraduate education in these subjects is expanded, as are various short-term courses. This means that young and competent people familiar with business ethics are already working in these areas. Scientific and expert work in business ethics, including scientific forums and other events, is encouraging (Ethics in the Bulgarian Economy, 2009).

Also **favourable for the dissemination of ethical behaviour** are the codes of ethics introduced in national, regional and local public institutions, various organizations, including corporations and companies (which can be found on the websites of the respective institutions). There are ethical committees for individual organizational units – permanent or established on a specific occasion. They are an indicator and a guide to the professional behaviour of different sections of society. However, more content remains to be invested in this activity.[6]

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[6] An example of a lack of actual work is the Ethics Committee of the ruling GERB Party in the country, established in 2019 with the aim of preventing compromised and corrupt individuals from candidates for that party in the local elections, which were scheduled for the end of October 2019. It was created in connection with reports of misuse of governing bodies at various levels with European funds. However, the Ethics Committee has acted unethically towards the public, disappearing from public sight all summer long, and has not ruled on any of the numerous corruption scandals surrounding the ruling party's self-serving mayors. The question is what the point of setting up such a committee is and who will be personally responsible.

5. Ethical dimensions in selected spheres of public life

Legislative activity and ethics

The legislative process in the National Assembly (NA) continues to be fraught with serious shortcomings. According to polls, people's approval of the National Assembly for years has been only 8%. Legislative changes are proposed without serious justification, most often there is a lack of cost and results estimates, and no efforts are made to inform citizens what is changing and what the consequences of the amendments will be.[7] Most often the legislative initiative is motivated by arguments related to EU laws – 24.2%, as well as the inefficiency of existing legislation – 21.5%. The general impression of the public is that in many cases laws are written in favour of the big business and especially some of its representatives. The practice of passing bills by which other laws are amended in the transitional and final provisions is cited as dangerous in the cited study (38%). In 94.7% of the bills, there is no information on public consultations or discussions on the problems and reasons for the change. The reasons are almost always (92%) lacking the views of stakeholders. In 70.4% of the bills, there were no specified deadlines for achieving their goals. Most often (in 77.4%) the amount of funds that would be necessary for the implementation of the adopted new legislation is not indicated. In 96.4% of the cases, there are no mechanisms for assessing the costs and results of the relevant legislative initiative. A whopping 89.9% of the bills do not include any references to research and scientific expertise in their justification. This confirms the well-established notion that legislative changes are written without the assistance of competent specialists in the relevant fields. Moreover, in the current composition of the National Assembly of 240 representatives, less than 20 have a legal education.

A special Advisory Council on Legislation was therefore set up at the NA. However, its work failed to amount to something meaningful, forcing its chairman, respected lawyer Prof. O. Gerdzhikov, propose its disband.

Ethics, as well as the principles of government in the legislation in Bulgaria, are considered to be violated due to the fact that almost all adopted laws are based on the strong influence of the executive authority. The latter, in turn, is in line with the interests of the popular phrase in the country "hoops", that is, oligarchic firms that financially support political parties.

Freedom of speech – ethical dimensions

In recent years, the public media meet increasing disapproval in society. Media ownership is not clear and this has been maintained for years. However, it is not difficult for the public to understand whom they serve. Their coarse empowerment is being observed, appointing

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[7] This is indicated in the analysis of the legislative activity for the first two years of the term of the 44th National Assembly, made by the National Center for Parliamentary Studies. 388 bills are the subject of the study. See. Laws are passed without serious justification and public debate, July 15, 2019, available at: https://www.dnevnik.bg/politika/2019/07/15/3938390_zakonite_se_priemat_bez_ seriozna_obosnovka_i/

people in positions of power without the necessary qualifications but convenient by political criteria. Instead, active journalists are isolated or threatened with dismissal, whose professional positions may be intimidated by certain executives or circles. The media seemingly enjoy freedom, but the tabloid media prevails and in practice, the public is not properly, objectively informed. The participation of journalists in public appearances by the government is restricted. For example, at the public announcement of the newly elected EC President and the Prime Minister of Bulgaria (September 2019 in Sofia), microphones were physically removed (not only switched off) in order to exclude media participation. Many of the statements do not demonstrate values and principles, and journalists use self-censorship to say what they are expected to say and which is politically correct.

This can be explained by the dramatic decline in Bulgaria's rating in the Press Freedom rankings organized by Reporters Without Borders.[8] From index 38 for 2002, the rating has steadily and steeply increased to index 70 for 2010, 113 for 2016, having remained at 111 in the last two years (Figure 1).[9] Thus, the country falls into the group of *those with visible problems*. For comparison, in 2018, Norway is the first, followed by other countries, including the EU-members: Netherlands – 3, Belgium – 7, Estonia – 12, Germany – 15, Latvia – 24, Spain – 31, France – 33, Romania – 44, Italy – 44, etc.

The picture could be summarised using the opinion of the Transparency International: "It is often unclear who owns which media outlets in Bulgaria and what political connections they may have. In addition, many outlets are financially dependent on state advertising, which may colour their reporting and affect any criticism they may otherwise provide to government authorities. Our chapter, Transparency International Bulgaria, is working to

[8] The Press Freedom Index is an annual media freedom ranking compiled and published by Reporters Without Borders. The ranking reflects the degree of freedom of journalists, the media and Internet users in each country, as well as the efforts of the authorities to respect that freedom. The assessments are based on the responses to a questionnaire created by Reporters without Borders and distributed to experts in all 180 countries surveyed. The questionnaire includes 87 questions on topics such as pluralism, media independence, media environment, self-censorship, legal frameworks in which the media operates, transparency, and the quality of the infrastructure that facilitates the production of news and information. The qualitative analysis criteria are combined and form a rating that takes a numerical value from 1 to 100. Each country is rated on this principle, with high index values indicating non-free media and low being free.
The World Press Freedom Index is an annual media freedom ranking compiled and published by Reporters without Borders, also known under its original name Reporters Sans Frontières. It is an international NGO based in Paris that conducts political advocacy on issues relating to freedom of information and freedom of the press.The ranking reflects the degree of freedom of journalists, the media and Internet users in each country, as well as the efforts of the authorities to respect that freedom. The estimates are based on the responses to a questionnaire created by Reporters without Borders and distributed to experts in all 180 countries surveyed. The questionnaire includes 87 questions on topics such as pluralism, media independence, media environment, self-censorship, legal frameworks in which the media operate, transparency, and the quality of the infrastructure that facilitates the production of news and information. The qualitative analysis criteria are combined and form a rating that takes a numerical value from 1 to 100. Each country is rated on this principle, with high index values indicating non-free media and low being free.
[9] For a more logical understanding of the process of decline in press freedom, the graph is presented in negative numbers.

help monitor elections, engage citizens in speaking out and advocating for stronger anti-corruption measures across the country." (Western Europe and EU, 2019).

Figure 1

World Press Freedom Index of Reporters without Borders, 2002-2018
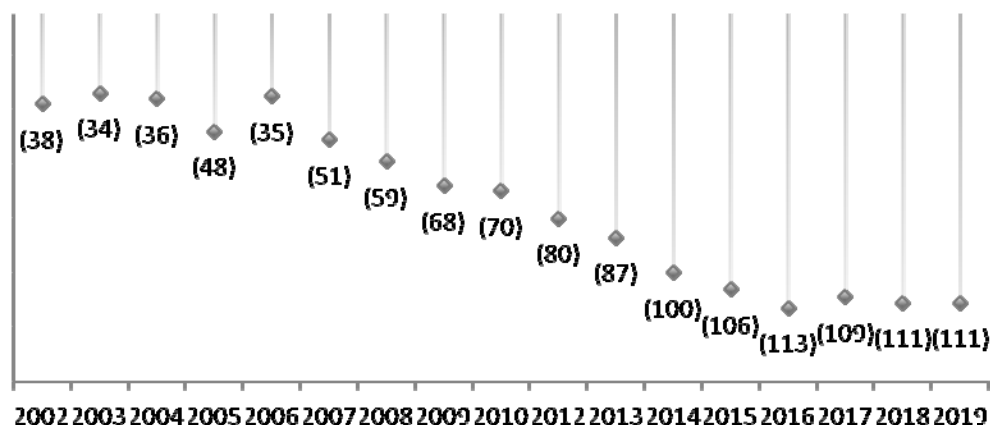
Note: For a more logical understanding of the process of decline in press freedom, the graph is presented in negative numbers.

The shadow economy

The shadow economy is definitely related to the ethical dimensions of business. According to experts, the current level of the shadow economy (grey, hidden, informal) in Europe is about 20-25% of GDP. Three authors analyze the determinants of the shadow economy in 10 CEE member states, based on data from 2003-2016 (Navickas, Jušius, Navickas, 2019, pp. 1-14).[10] Data shows that during this period the shadow economy is the lowest in Slovakia (about 14%), while it is highest in Bulgaria (about 30%). Despite the tendency for this economy to decline over time, it is important to understand which economic factors (variables) predetermine it and how they affect its size.

Empirical results lead to the conclusion that if the freedom of business or GDP per capita increases, the shadow economy will decrease. Furthermore, empirical evidence does not support the theoretical rule that when income tax burden increases, more people may switch to shadow activities to save money.[11] This also applies to the case of Bulgaria, where, since

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[10] The size of the shadow economy is measured as a percentage of GDP in a regression in which it is a dependent variable, and independent variables are as follows: income tax, unemployment rate, corruption level, income inequality, self-employment rate, freedom of business and two controlling independents – consumption tax and GDP per capita.

[11] The authors of the article suggest that this dependence may be due to a defect in the model and is most likely determined by other dependent variables.

2008, Bulgaria has the lowest direct taxes in the EU (10%).[12] The authors' recommendations to the governments of individual countries are to look more deeply at two other variables that affect high levels of the informal economy – corruption and income inequality, categories that are also relevant to business ethics. To address these issues, the Government must take complex decisions such as progressive taxes, increasing fines for illegal acts, introducing measures to increase tax morale, and more. The authors of the article conclude that more opinion polls and further analysis are needed through its results. In order to decline of the hidden economy, responsible government institutions, scientists and experts need to cover the processes more deeply and in detail by conducting studies of different groups of society. This will allow for a differentiated view and, with regard to the tax system, the identification of an "optimal" level of taxation, which would allow maximizing government tax revenue by reducing the size of the shadow economy.

Another study, conducted for Bulgaria, takes a different approach by calculating the Light Economy composite index.[13] According to the authors, more and more companies are operating in the light today. The number of companies paying taxes and operating legally increases from 74.55% in 2017 to 79.10% in 2018. According to the report by 2023, 84% of the Bulgarian economy will operate "in light". The most widespread and the most problematic events in 2018 are the areas related to business ethics: employment relations; corruption and opacity in the selection of contractors; non-issuance of cash vouchers in the field of services. According to the authors, more attention should be paid to the planning and implementation of future actions to curb and prevent the informal economy.

Corruption in Bulgaria – Ethical Aspects

Corruption as an abuse of state power has been a major problem for Bulgaria over the past 30 years since the transition to democracy and a market economy. It is a major impediment in achieving economic and social progress to this day, including the foreign capital's fear to enter Bulgaria. The adverse impact of corruption practices in Bulgaria has been repeatedly reflected in EC monitoring reports,[14] followed by sanctions such as suspension of the European Phare Pre-Accession Programs (2008) and others (Report from the Commission…, 2014).

As M. Dimitrov notes, the normal functioning of a market economy presupposes the presence of an effective administration with control over the fraudulent and corrupt economic behaviour. This also requires the presence of real democracy, separation and control between the authorities, an effective and independent judiciary, independent media, etc. However, tax fraud is widespread in Bulgaria and has a significant impact on the country's economic life. Adding to the unfavourable level of corruption, the high share of

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[12] It has been proven in practice that even a significant reduction in the tax burden does not lead to a significant reduction in the size of the shadow economy.

[13] Report of the Bulgarian Industrial Capital Association (AICB). National Center for Light Economy. Sofia. 1.07.2019 Available at: https://www.investor.bg/.

[14] A mechanism for co-operation and verification through which the European Commission monitors the progress of the establishment of an independent judiciary, the fight against corruption and organized crime in Bulgaria.

the grey and black economies, this environment is a strong risk factor that threatens the stability and normal functioning of the economic system (Dimitrov, 2017, p. 39-43).

The widespread deployment of corrupt practices, the failed judicial system and the apparent lack of justice are among the most serious factors hampering the development of civil society and triggering a large-scale emigration wave, which in turn exacerbates the country's dramatic demographic crisis. The presence of persistent and pervasive corruption scandals affecting prime ministers, ministers and MPs, as well as the refusal to hold them accountable for their crimes (the most common measure is removal from office), devalue not only democratic values but also confidence in politics. As a result, instead of through responsibility and active action, society reacts with apathy and personal survival behaviour. As is sometimes found, corruption practices have taken hold of state institutions to a degree that threatens national security and poses a direct threat to statehood.[15]

Bulgaria was first included in Transparency International's (TI) Corruption Perceptions Index (CPI) in 1998 at 2.9 (29).[16] Over the period from 1998 to 2002 it significantly increased up to 40 (Fig. 2). In 2002-2007 the CPI remained at almost the same level. This was a successful period of development during which Bulgaria was vigorously preparing for EU accession. GDP grew significantly, which has been reported as a success in counteracting corruption (Rangelova, R., 2010, 196-201). In 2005, Bulgaria had a higher index than countries close to it, such as the Czech Republic, Croatia or Greece. In 2008, the country with index 36 reached the bottom of the EU-wide corruption ranking with an average index of 65. This ranks Bulgaria last in the fight against high-level corruption and organized crime, as well as the lack of evidence that bribery is punished. Moreover, even countries such as FYR Macedonia, Turkey, Albania and Romania have marked an increase in CPI, which means improving the anti-corruption environment. As noted in the 2008 TI Report: "Over the last two years, corruption in public procurement and strategic concession contracts, paralyzed by corrupt structures of the justice system and abuse of EU funds intended to modernize the country – for which it was recently imposed sanctions – have reversed Bulgaria's progress so far, severely damaged its international reputation and diminished confidence in national institutions." The CPI for Bulgaria remains at a low level in the three years following the global economic crisis in 2008. In 2011, the country's index was 33 and the country was 86th in the TI ranking. Since then, the CPI has risen to a little over 40, but it remains permanently at this low level and our country is in the position of the most corrupt in the EU.

In the TI survey for 2018, the feeling of corruption in Bulgaria continues to be highest among EU countries. Among the 180 countries surveyed in the world, Bulgaria ranks 77th with CPI 42 at the EU average 66.[17] Romania ranked 61st with CPI 47 has reported progress in recent years, gradually moving ahead of Bulgaria. Despite EC monitoring under the

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[15] See: Historical overview of corruption in Bulgaria during the years of democratic transition (1989-2014). The Corruptionist Bulgaria Project, 2016. America for Bulgaria Foundation. Libertarium Civil Society.
[16] By 2011, the CPI are reported on a scale of 1 to 10, and then transferred to a system of 1 to 100. This study uses the current used scale.
[17] With CPI 42 for 2018, Bulgaria is commensurate with countries such as Burkina Faso, Ghana, India, Turkey, Lesotho, Kuwait. Available at: https://www.transparency.org/cpi2018.

MCV, Bulgaria remains last among the EU countries. By latest estimates (2019), the best achievements in terms of high CPI have the Scandinavian countries, with Denmark – 87, Finland – 86, Sweden – 85, etc., but very close to Bulgaria (43) are Hungary and Romania – 44.

Figure 2

CPI in Bulgaria, 1998-2019
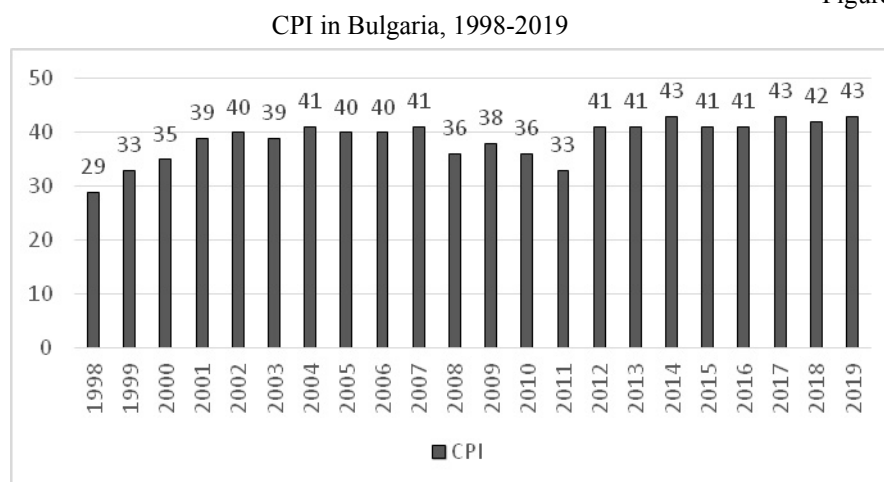
Source: TI.

It turns out that Bulgaria's EU membership has not only not had a positive impact on the fight against corruption in power, but has a deterioration. This is mainly due to the lack of political will and hence the lack of anti-corruption measures taken, and to the tolerance of the public for corrupt practices in power. Romania, which was traditionally after or around Bulgaria, has already registered better development. It has long been recognized that Bulgaria needs a new approach to counteract corruption. In the upper echelons of power, employees are subject to financial temptation and dependence, and they want to emulate the material conditions of the Western European way of life. Officials may have less resistance to corruption because, in many cases, they have been catapulted from lower positions of authority and therefore lack a sense of mission and responsibility.

The main areas of corruption are the following: strategic concession deals, public procurement, the judiciary and misuse of European funds, which undermine the country's international image and diminish confidence in the institutions. In the TI Report 2008 is stated that in Bulgaria, the majority of citizens do not trust the political institutions and do not feel well represented. Supervision of party funding is limited and the country lacks independent and transparent media. It is not clear who owns certain media, many media are financially dependent on state advertising, and this may affect their work and the criticism they would otherwise apply to government authorities. Urgent action is needed to combat political corruption at the top of power, but there is no political will to take such action. A widely shared opinion by experts and the public is that it is unacceptable for high-level

corruption officials or just people caught in a conflict of interest to be dismissed with gratitude for a job well done. They should be fired and sent to the prosecutor's office.[18]

The trends in the change of the CPI indices for Bulgaria point to the main conclusions. *Firstly*, during economic progress, corruption seems to be diminishing and vice versa is during times of economic and political hardship. *Secondly*, with the distance from the central planning period, there is a tendency for corruption to increase. This means that no direct link to the legacy of state socialism can be sought and the reasons for this can find in the fundamentally different conditions of the two systems – totalitarian management with limited channels of corrupt transactions with limited financial resources under socialism in difference with the current reality of a market economy and its peculiarities. It turns out that even in conditions of democratic governance, schemes and lasting forms of corruption can be built on the levels of power. *Thirdly*, it is unacceptable for Bulgaria not to experience a positive change in reducing corruption over this relatively long period of EU membership. This means that the measures taken at the national management level, as well as the activities of individual anti-corruption organizations, have no influence.

6. Empirical findings for emerging and developing business ethics in Bulgaria

Survey 1996

The study of business ethics examines business practice in the light of human values.The author of this article organized and conducted a public opinion poll on business ethics in Bulgaria in 1996. Its results give an indication of the ethical infrastructure of the emerging market in the then emerging then market in Bulgaria, and more generally, of the ethics of the Bulgarian society and of the emerging business culture in the country in the initial phase of transition. The purpose of the study is to outline the state of business ethics in Bulgaria, to seek connections with political and economic problems and traditions.[19] The results obtained serve as a concrete basis for a critical review of business ethics, as well as for finding the necessary questions and ways to improve the ethical climate in the country (Rangelova, 1997, p. 220-229).[20]

In terms of morality and ethics, the real situation in Bulgaria is rated as "rather bad" by 71% of all respondents, "very bad" by 23% and "rather good" by only 6%.[21] The overall average score of all groups is 3.15 with an average estimate of the state of Czech society

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[18]Available at: http://www.transparency-bg.org/.

[19] It should be noted that it is extremely difficult to empirically and accurately measure ethical values. Using questionnaires as research tools, researchers are aware that they provide more data on *ethical principles than on ethical behaviour.*

[20] The total number of respondents in Bulgaria is 300, distributed evenly by groups. These groups are as follows: management students, law students, economics scholars, business representatives (over 50% of their companies work in sales and distribution, others work in manufacturing, industrial and financial services), workers and public servants: teachers, journalists, economists, administrators, agronomists, translators, editors, accountants and more.

[21] The using scale is: 1 = very good; 2 = somewhat good; 3 = a little bad; 4 = very bad. The average scores for each group are 3 (for businessmen) and above (for others).

2.89 for the population, including 2.91 for Czech companies and 2.78 for foreign companies.[22] Judging by these results, we can conclude that either the situation of Bulgarian society in terms of ethics and moral behaviour is worse than that of Czech society, or Bulgarians are more critical of reality (or both).

The issues of good business ethics in the philosophy of politics and operations of the respondents in Bulgaria are very important for the overwhelming majority of the respondents – 64%, somewhat important – for 25%, slightly important – 9.5%, and they have little importance – for only under 2% from them. In the case of the Czech Republic survey, this issue is very important for 76% of Czech companies and 82% of foreign companies.

Respondents evaluate the situation in selected areas of Bulgarian society in terms of ethics and moral behaviour as follows. The most unethical behaviour one can feel is in political life (MPs, government, political parties), followed by justice and police, as well as people in their daily lives. The most favourable is the attitude towards foreign companies and foreigners in Bulgaria. The ranking of these areas of Czech society is approximately the same, but all average scores are below 3, which means they are "very good" or "somewhat good". Another difference is that Bulgarians are more critical of their daily lives than Czech respondents are. Both studies show good treatment of the media and journalists.

Similar questions were asked in another poll conducted in Bulgaria by the National Center for the Study of Public Opinion (September 1994).[23] It turned out that in terms of morality and integrity, public opinion ranks the professions in descending order as shown on Table 1.

The reasons for ethical and moral problems in business and commerce are divided into three groups, the first being the strongest one related to the reproach of economic reforms and inefficient institutions that do not account for ethical behaviour; the second – with the mentality and rules of behaviour in Bulgarian society, disregarding ethical rules, and the third, with the least influence – with a legacy from the past of state socialism.

The reasons outlined above also suggest ways to reduce ethical problems, which are predominantly based on (in descending order):

- new stricter laws and their consistent implementation;

- education (family, school and influence of different organizations);

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[22] This survey was conducted within the PHARE ACE Program Building the Ethical Infrastructure of the Market project. Leader: CERGE-EI, 1995–1996. The main difference between this study and the study in the Czech Republic is that the latter examines the ethical climate in entrepreneurial circles, covering both domestic and foreign companies, while in Bulgaria the nature of the questionnaire is taken into account to reflect business ethics throughout society, and not just businessmen. Due to the parallel conduct of the survey in Bulgaria and the Czech Republic, the results obtained are compared in some places.

[23] See: Banker, (weekly newspaper), Sofia, October 3, 1994.

- increased government and parliamentary attention, as well as public attention, the media and journalists;

- consistent removal of the old communist nomenclature from the management of the companies.

Table 1

Ranking the professions according to their level of morality and integrity, 1994 amd 2019

№	Year	
	1994	2019
1	teachers	teachers
2	TV journalists	military
3	military	radio journalists
4	radio journalists	priests
5	medicals	medicals
6	priests	TV journalists
7	newspaper journalists	lawyers
8	judges	bankers
9	lawyers	police
10	bankers	judges
11		newspaper journalists
12		prosecutors
13		politicians

Sources: Banker, (weekly newspaper), Sofia, 3 October 1994 and the author's survey from 2019.

Bulgarian respondents focus on legality, while Czech respondents place the role of education first. In both studies, the factor "the consistent removal of the old communist nomenclature from the management of companies" came last.

Violation of ethical standards has economic consequences. Almost all companies in the Czech Republic are convinced that bad business practices cause additional costs for them. Traditional companies are most seriously affected. This very important fact, indirectly illustrating the results, shows that "pay ethics" is less evident in the Bulgarian survey.

The predominant majority of respondents in Bulgaria (57.5%) agree that without active intervention, the moral state of society will not improve. This group consists mainly of researchers and law students. They are followed by those who think that these are temporary problems that will disappear over time (38%). Employees are most represented here. The proportion of respondents who think that there is nothing they can do about the current situation is very small (4.5%). Interestingly, these respondents are among management students and workers.

The Bulgarian respondents expressed their opinion on some personal characteristics that are important for the success of the business. First, they put the ability to learn new things, creativity and innovative approaches, followed by good contacts and patronage, and the negative traits of "power and corruption" and "ruthlessness and the ability to pretend" are placed last.

In general, the main conclusion can be drawn that the authorities (government, parliament, state administration) in Bulgaria in the early years of the transition provoked the disapproval of the people. Political and legislative systems often do not demonstrate or promote ethical behaviour. People need legitimacy, security and control. Effective action is needed to judge individuals who have personally benefited from their positions. However, it is more important to lay the foundations for a principled attitude to this phenomenon.

According to the results, women place greater importance to ethical and moral behaviour than men do. Women and students are more critical about ethical aspects than other groups. Businesspersons have a broader perspective on problems. They are more critical when they have to give an opinion on social and economic life in general and are less critical if the opinion relates to their activity.

Survey 2019 – Comparison of Results

In order to find answers to the questions about how ethics is assessed in Bulgaria today and whether there are changes after more than 20 years, a survey was conducted in 2019 of a sample based on the previous questionnaire.[24] The aim is to get a more up-to-date look at ethics, more so additional questions are asked and to make some comparisons with the results of the 1996 survey.

Respondents' answers to the comparison of the morality of the 1990s in Bulgaria and today are quite heterogeneous – the highest percentage, one third say that the picture is worse, the next ones are the ones with the answer – the same – one quarter, improved – over one fifth (22.2%) and changed, but not in plus or minus sign – 14.8%. According to 3.8% of the respondents today, we see a moral decay.

More than two-thirds of those polled are aware of good ethics as very important in politics and business operations; in just over a quarter, it is somewhat important and 7.4% rather insignificant. Given the nature of the sample of respondents and its difference with that of the 1996 survey, it is striking to maintain too close percentages in assessing the importance of ethics for such a long period.

The respondents' opinion on the comparison between the ethics before 1989 and the present can be tentatively followed. Of course, only those who have direct impressions answer this question, which is 54 in number. More than half of them (55.6%) think that the ethical environments of state socialism and the market economy today are too different to compare, but the proportion of those who believe that the previous ethics was better than the current one is 25.9%. In support of today's ethics, 11.1% are declared.

It is interesting to compare the different professions according to the level of morals and honesty of their representatives (Table 1). The comparison leads to some conclusions: (a) Generally speaking, there is a good opinion for teachers as rank leaders and of the military,

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[24] Total 60 people were interviewed, 25% of them aged 30-40 years, 50% of those aged 40-60 and 25% of those aged over 60. Almost all of them are directly involved in scientific activities in economics – lecturers at various universities and researchers at the Bulgarian Academy of Sciences.

which have an increasingly limited role over time due to their diminishing number and importance. The opinion for priests who played an unfavourable role in the 1990s for schism in the church is increasing. Medical doctors keep their positions, and there is a movement among journalists – increasing the confidence in radio journalists at the expense of TV journalists and reducing this to newspaper journalists. At the bottom of the rankings, that is, the most unethical behaviours are representatives of the law-enforcement system, police officers and politicians (MPs, government, political parties). These general findings are in line with both the results of the 1996 survey, 1994 data and the analysis in the rest of the article.

Nearly three-quarters of those surveyed say that the moral level of society will not improve without active intervention, about one-fifth believe that there is nothing they can do about the current situation, and only 7.7% think these are temporary problems that will disappear. The active interventions include: increased attention from the government and parliament, the introduction of new stricter laws and their consistent implementation, increased attention from the media and journalists, increased education in this area (family, school and influence of various organizations) and more.

The question is whether Bulgaria's EU membership has influenced business ethics for 12 years. Regarding the introduced common rules and standards, legal regulations, and so on by equal percentage (42.3%), they said that it had influenced to improve or remain the same, and according to 11.5% the membership had influenced the deterioration of ethics. Another focus is on how the EU membership has influenced business ethics through the international environment, opening the country to the world, and more. Half of those polled believe that the ethics are the same as before the membership, more than a third have improved, and according to 11.5%, membership (as in the previous question) has influenced the deterioration of ethics.

Conclusion – Challenges to Business Ethics in Bulgaria

As a result of the analysis of the established and practised business ethics in Bulgaria over the last 30 years, some generalizations and recommended actions can be outlined with regard to the further development of a sustainable ethical environment in the already established market economy of Bulgaria. Among them are the following:

- The economic development of the country is expected to accelerate in order to achieve a significant increase in the incomes of the population, reduction of poverty and the difference between the incomes of the poor and the rich. Then the view of the poor in terms of business ethics will be encouraged. Something that has not yet taken place in the country because of the great difference between the poor and the affluent is to develop a strong middle class that can organize a stable civil society.

- Another very important issue is to change the established public institutions in order to be effective in their activity and ethics. This concern, first of all, the higher echelons of power, who so far indicate that they have little interest in such a change. If economic and social policies are stable and well regulated, the rules for relations between the

government and the various agents (entrepreneurs, trade unions, society, etc.) are well defined and their cooperation is transparent and publicly controlled, there is a better chance of social responsibility.

• It is very important for people to realize that they themselves have to take their share of the individual responsibility for the whole society. The role of informal organizations is increasing, as are non-governmental (non-profit) organizations or other intermediary structures that would support the spontaneous initiative of citizens. Before that, however, NGOs in Bulgaria themselves have to reevaluate their role, which largely supports clientelism and corruption in the name of their own existence. These organizations must seek greater connection with, and influence over, society.

• The discipline of business ethics should enter into broader courses in economics and business administration, organized by Bulgarian universities and various management training centres. It is appropriate to introduce the subjects of studying the shadow economy and corruption as social phenomena.

• Existing and emerging institutions, companies, associations and other organizations, incl. NGOs should initiate public discussions, scientific conferences and other business ethics initiatives, and conduct ethics education and training programs to promote ethical behaviour.

• The media in Bulgaria should take on the role of the fourth authority to promote ethical standards and business ethics in public life. However, in the current period, the media themselves need a strong and painful reform to be able to do so.

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INSTITUTIONAL TRANSMISSION IN ECONOMIC DEVELOPMENT[4]

The main objective of this study is to provide a theoretical and empirical framework for analyzing the relationship between economic growth and the property rights institute in different countries. The key idea is that property rights are multifarious and can be classified according to their role in economic development. These days it is the intellectual property rights that impact the economic development through propensity to innovate. However, the protection of intellectual property rights does matter for economic growth only in a well-developed political and legal environment. We find that economic performance in highly developed countries is to a greater extent contingent upon a quality of the protection of intellectual property rights than in less developed economies. This finding raises an important question about the credibility of the preponderant approach based on a simple unification of countries with a different institutional framework under one umbrella when their effects on growth. Such an approach may provide inconsistent and misleading results and lead to false conclusions and wrong policies.
JEL: B52; E02; K11

Introduction

The thesis that effective institutions accelerate economic growth finds theoretical and empirical evidence in Western literature (Helliwell, 1994; Chousa, Khan, Melikyan, Tamazian, 2005; Redek, Susjan, 2005; North, 2005; Acemoglu, Robinson, 2012; Labunska, Petrova, Prokopishyna, 2017; Odinokova, Bozhinova, Petrova, 2018; Gryshova et al., 2019; Adamišin, Vavrek, Pukala, 2015; Pukala, 2014; Mussapirov et al., 2019). The institutional

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argument states that clearly defined and well-protected property rights contribute to economic development, directly or indirectly affecting the dynamics of the main determinants of growth (de Soto, 2001). However, there are some studies where the relationship between them does not seem linear and homogeneous (Chang, 2011). The high sensitivity of the results to the composition of the sample is mentioned, up to a sceptical assessment of the importance of this institute (Angeles, 2010). This polarity of the results leads to a search for reasons that explain the nature of these discrepancies.

The main purpose of this research is to provide a theoretical and empirical basis for analyzing the relationship between economic growth and property rights in different countries. The emphasis is on the fact that property rights are diverse and can be classified according to their role in economic development.

1. Literature Review

1.1. The institutions and economic growth

Studies in growth theory confirm the idea that the quality of institutions predetermines the pace of economic development of the country. It is believed that developed democracy, effective property rights and a fair judicial system are prerequisites for high growth rates of the economy (North, 1990; Siddiqui, Masood, 2009; Assane, Grammy, 2003; Knack, Keefer, 1995; Mulligan, Sala-i-Martin, 2003). Such conclusions, however, are based on the empirics of economically developed or developing countries. In the transitive and reformed economies, the dependence of the rates of economic growth on the quality of institutions receives a different interpretation.

Thus, democracy is seen as a threat to the economic development, since it allows lobby groups to extract significant private rent in the face of an unsettled political sphere (Radygin, Entov, 2008). Therefore, attempts to weaken the administrative levers are criticized. For the accelerated development of the economy, the first priority is to ensure political stability.

The legislative base, property rights, judicial system and other institutions are also pessimistic. It is noted that their availability alone does not ensure the prosperity of the economy (Mau, 2007). Not less important is how exactly these institutions are used. Some studies reveal the possibility of their misuse for the purpose of extracting personal benefits (Polishchuk, 2008).

The institutional reforms are evaluated as inconclusive because there is no coherence between them and industrial policy (Polterovich, Popov, 2006), national peculiarities of the economy are ignored when copying Western institutions (Lenchuk, 2000), mental inertia is ignored (Kantsurov, 2011), there are no efforts to change informal institutions, in particular, business culture (Yeshchenko, Koval, Tsvirko, 2019). Institutional transformations are considered as a way of redistributing economic benefits without improving the quality of products and increasing its volumes (Polterovich, 2007). The goal of reforms is to obtain economic power used to lower costs in an artificial way, to overstate prices, and to abandon the burden of social payments. This kind of rent is in most cases preferable compared to

innovative rent, which suppresses the demand for innovative strategies and, as a result, contributes to the destruction of the educational and scientific infrastructure (Dementiev, Vishnevsky, 2011).

In general, the institutional framework in transitional countries is recognized as a deformed set of institutional traps (Polterovich, 1999). The reason for its poor quality is the revolutionary way of creating institutions, which caused a discrepancy between implanted formal and prevailing informal norms. As a result, there was a filtration of perception and interpretation of institutions imposed by the state through an established prism of values. The implemented institutions mutated, became ineffective and lost their public functions. Their improvement entails significant transformation costs, both economic and social, so governments prefer to remain within the established institutional system, changing it de jure, but not de facto (Tamilina, Baklanova, 2012). The way out of this situation is seen in economic development, which can become a prerequisite for institutional improvement (Polterovich, 2008).

There are also Western works that deny the homogeneity of the connection between the quality indicators of formal institutions and economic growth (Przeworski, Fernando, 1993; Sirowy, Inkeles, 1991). The explanation of this phenomenon is usually reduced to the dependence of this relationship on the level of maturity of institutions (Barro, 1997; Butkiewicz, Yanikkaya, 2004). It is argued that the state of institutions and the effectiveness of public policy are determined by the trajectory of the country's previous development (Acemoglu, Robinson, 2012). It is said that feedback is ignored: the impact of economic development on institutions (Chang, 2011).

Thus, there is a kind of discrepancy in understanding the role of formal institutions in economic development. In our opinion, the revealed heterogeneity has a more complex nature and depends to some extent not only on the level of maturity of institutions but also on the mechanisms for their implementation. In addition, these phenomena are closely interrelated, since the potential for the development of institutions is largely predetermined by the effectiveness of the institutional transmission. The resolution of this contradiction becomes possible when establishing a logical chain of the mechanism of the influence of institutions on long-term economic growth.

1.2. The property rights institute as a long-term factor of economic development

The most important institutional framework of the economic system is the system of property rights, that it determines the type of social organization. A study made by Waters (1987) showed that the most effective is the regime of private property. Chang (2008) points to the high efficiency of government-owned property. Besley and Gatek (2009) argue that different types of property are effective, most importantly the clear certainty of rights. At the same time, history also shows negative examples of the influence of this institution on economic development. Thus, Allen (2009) calls the excessive protection of the rights of private property one of the reasons for France's lagging behind England in the 17th-18th centuries. Chang (2011) believes that in our days excessive protection of shareholders' rights in corporate ownership allows them to exert pressure on managers.

70

On the other hand, the practice of fast-growing countries (China, India) demonstrates that high rates of economic growth can be achieved with poor protection of rights. So, the Chinese settlement enterprises (TVE) are able to expand to the scale of the world market, despite the indistinct and intricate property rights. Studies by Angeles (2011) showed that strong property rights have been in developed countries for a long time, and in modern underdeveloped countries they are not present until now. Thus, the progressive role of the institution of property rights is questioned.

There is also an opinion that the rapid development of the West is due to the high rate of savings (Popov, 2014). This makes possible to work out the recommendations for transition economies to hold the balance between the scale of restructuring and investment potential. However, this model links economic growth exclusively with the accumulation, ignoring technological efficiency. In neoclassical models, this factor is taken into account, but the mechanism of its occurrence is not explained. Endogenous growth models (Romer, 1990; Grossman, Helpman, 1991; Aghion, Howitt, 1992) have shown that knowledge has increasing returns, but was unable to solve the riddle Jones (Jones, 1995). The connection between the increase in the number of resources directed to R & D and the rate of growth in per capita output has not been confirmed.

The proposal to include in the growth model a hypothesis that new technologies are created by entrepreneurs, using the knowledge accumulated in the R & D sector, allows us to explain the riddle of Jones (Arefiev & Arefieva, 2010). Thus, there are two stages in the innovation process – scientific discovery and its use in the economy. An even longer chain is known: "invention" – "innovation" – "diffusion" – "copying" (Mokyr, 1994). This distinction allows us to consider innovative investment in the time and sectoral context. If the first stage involves the scientific sphere, the next one – the production, market, environmental, even political spheres. This translates the consideration of the problem in the field of institutional research.

An unfavourable institutional environment can block the innovative entrepreneurship; as a result, non-functioning assets will remain "dead capital" (De Soto, 2001). Studies have shown that institutions that stimulate innovation are property rights and contract freedom (Pejović, 1984, 1989). In our opinion, it is important to see in what cases a well-developed system of property rights becomes a stimulus for technological progress, and in which ones it is just a brake.

The institution of property rights, as well as any other institution, varies according to the nature of the production activity. Until the production resource isn't so widely used to change production relations, there is no motivation to regulate its use by certain norms. Therefore, even the most developed system of slaveholding law – Roman law – viewed property as an object of personal use. Even servitudes with the right usufruct did not become an impetus to the development of legal relations, since they did not establish the full right to the object and did not allow changing its economic purpose. In the period of feudalism, the norms of private law did not practically change. The turning point in property relations was the abolition of the prohibitions on the fencing of lands in England (1593), which actually legalized the ownership of land as a means of production. Marx called the period of the late fifteenth and early sixteenth centuries "the prologue to the coup that created the basis of the capitalist way of production." A certain interest in studying the

development of market relations is the influence of the traditions of Roman-German civil law and the Anglo-Saxon common law on the evolution of the institution of property. The Anglo-Saxon legal system proposed a more flexible approach to the establishment of property rights and contributed to the accelerated concentration of capital, and then to the rapid development of the industry. Conversely, a well-developed system of property rights within the framework of Roman-German law steadily defended the interests of French landowners and slowly adapted to the interests of the industrial bourgeoisie, which resulted in a backlog of France from England. In 1776, when Turgot's attempts to enforce liberal laws that undermined the foundations of absolutism failed, an industrial revolution was already taking place in England. The shift of common law from the concept of a single, unrestricted and indivisible ownership in favour of a complex bundle of rights allowed each subject to receive a certain income. This approach later became the basis for the conclusion of complex transactions, such as trust management of property, leasing, franchising, etc. The need to regulate relations in the new field – inventions, contributed to the development of patent law, which has been modernizing with the growth of scientific and technical progress. Integration processes, formalize the Treaty of Rome (1957), became the impetus for the convergence of the Anglo-Saxon and Romano-Germanic patent and legal systems. The unification of the national patent laws facilitated foreign patenting and thereby encouraging the diffusion of knowledge and technology. The accumulation of knowledge means also the accumulation of capital (Yankovyi, Goncharov, Koval, Lositska, 2019). Protection of intellectual property rights – namely the establishment of a legitimate monopoly on the commercial exploitation of the technical implementation of the idea through the system of patents and licenses – allowing its owners to earn revenue from the asset is unique and creates thus the incentives for innovative investments. However, there are objections to over-protect it. So, Angeles (2011) sees the danger in the predisposition inventors to rent-seeking at the expense of old patents, as well as in the reduction of the positive effect on society as a result of monopolistically high prices on innovation, as well as in the high cost of maintenance of protection of intellectual property rights in time and monetary terms. According to Chang (2007a), excessive protection of IPRs may hinder innovation itself, preventing cross-fertilization of ideas and increasing the likelihood of the process deadlock caused by disputes between the owners of related patents.

Indeed, such conclusions are supported by many examples. So, there are critical reviews of patent practice in the field of IT[5]. The high cost of enforcement of intellectual property protection encourages piracy. A malicious infringer of patent rights is China – the country with the highest growth rates. This is evidence that economic growth (but not welfare!) is completely possible, and in the absence of well-protected intellectual property rights as well. The retrospective analysis of Angeles (2011) shows the difficulties of implementing the system of intellectual property rights protection in developing countries, and in fact proves that strong property rights have been in developed countries for a long time, and in

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[5] So, Google announced in 2011 that the IT-patents designed to promote innovation, "Now, on the contrary, serve as a weapon against them." According to the tactics of Microsoft, Apple and Oracle are to convict Google of patent infringement and force Android device makers to pay royalties to patent holders, available at: https://delo.ua/business/google-i-facebook-vystupili-protiv-patentov-na-abstraktnye-idei-192039/.

modern underdeveloped countries they do not exist until now. This suggests that effective implementation of property rights may depend on the quality of other institutions.

Thus, it is obvious that there is some scepticism about the role of the institution of property rights in economic development. However, the indisputability of innovations as a factor of long-term growth and their dependence on the investment climate in the country allows us to consider the indirect influence of the institution of property rights on economic development, through the propensity to innovative entrepreneurship.

2. Starting Hypothesis

2.1. The theoretical model: institutional transmission

Two aspects of the influence of property rights on economic growth can be identified. Firstly, the institution of the property creates the preconditions for the interaction of economic agents (public rules). Secondly, it provides incentives for efficient asset management. Ownership defines the rights and obligations of the owner of the assets, protects property de jure and de facto. They establish control over the execution of the contract and the possibility of expropriation (including through taxation).In turn, the protection of property rights motivates the economic agents to maximize their efficiency and stimulates innovation.

If the institution does not create incentives for efficient investment, it is evidenced by its inadequate productive activities (Koval, Kovshun, Plekhanova, Kvitka, Haran, 2019). Therefore, countries with a more developed institution of property rights have a higher level of economic development in the long run. Today, innovation is a key element in the institutional hypothesis: institutions create incentives to invest in human and physical capital, higher productivity; resulting in increased returns on all the factors (Scheme 1).

The increasing role of the innovation component in the modern world, the large differences between countries in terms of growth rates, welfare (GDP per capita), and institutional development allowed us to formulate the following hypotheses for further analysis.

- First, today innovations are the main factor of economic development, influencing it as an investment component.

- Secondly, the influence of this component depends on the level of maturity of the institution of property rights.

- Thirdly, the institution of property rights is a complex system of economic and legal relations in which the instability of one component can influence the efficiency of the other.

There is assumed the indirect influence of the institution of property rights to economic development – by the ability to innovate. Property Rights create an environment and incentives, so they should be a significant determinant of the level of innovation.

Scheme 1

The institutional transmission

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                    ┌──────────────────────────────┐
                    │   Institutional environment   │
                    └──────────────────────────────┘
                       ╱                        ╲
        ┌──────────────────────────┐   ┌──────────────────────────────┐
        │ Rules in the public sphere:│   │ Rules in the private sphere:  │
        │ • Independence of the judiciary│   │ • Registration of property   │
        │ • Rule of law             │   │ • Protection of physical   property rights│
        │ • Political stability     │   │ • Patent protection          │
        │ • Control of corruption   │   │ • Piracy                     │
        └──────────────────────────┘   │ • Access to credit           │
                    │                    └──────────────────────────────┘
        ┌──────────────────────────┐                  │
        │ • Conditions of interactions│       ┌──────────────────────┐
        │ • Control                 │       │ Incentives to invest in:│
        │ • Sanctions               │       └──────────────────────┘
        └──────────────────────────┘        ╱        │        ╲
                    │          ┌──────────┐ ┌──────────┐ ┌──────────┐
                    │          │   New    │ │  Human   │ │ Physical │
                    │          │technologies│ │ capital  │ │ capital  │
                    │          └──────────┘ └──────────┘ └──────────┘
                    │               │
                    │          ┌──────────┐
                    └─────────▶│ Innovation │
                               └──────────┘
                                    │
                         ┌──────────────────────┐
                         │ Economic development  │
                         └──────────────────────┘
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Source: adapted from Property Right Alliance methodology: www.propertyrightsalliance.org/

2.2. Methodology

2.2.1. Data and analysis methods

To test the hypotheses, we conducted an empirical study based on the generated database of 111 countries from all regions of the world and at all levels of their development. In the sample, several groups were singled out: 35 countries of the OECD with a high level of development; 14 high-level countries not included in the OECD; 17 countries that receive a significant part of the national income from the sale of natural resources. The first two categories were selected according to the World Bank classification. The last group includes: Algeria, Azerbaijan, Bahrain, Bolivia, Burundi, Chad, Ecuador, Kazakhstan,

Kuwait, Mauritania, Nigeria, Qatar, Russia, Trinidad and Tobago, United Arab Emirates, Venezuela, Zambia.

The database covers the period from 2008 to 2015. The indicators of 2016 were also included in institutional indexes. Statistical analysis showed that institutional data have no significant effect of time series due to the duration of institutional changes. Therefore, for econometric analysis, the primary panel database was transformed into a cross-sectional database. The values of economic and institutional indicators were averaged; this allowed us to determine the overall trends in the development of national economies. To assess the development of the institution of property rights, the integral index of the International Property Rights Index (IPRI) was chosen with sub-indexes included into it: LP (Legal and Political Environment), PPR (Physical Property Rights), IPR (Intellectual Property Rights). In 2016, the maximum values of the IPRI index were observed in Finland (8.38), New Zealand (8.27), Norway (8.25). The worst values are in underdeveloped countries such as Bangladesh (2.78), Venezuela (2.73), Zimbabwe (3.4). In the context of subgroups, the average value of IPRI in the OECD countries is 7.3; in non-OECD high-income countries – 6.2; in resource countries – 4.7. The analysis of sub-indexes showed that the most developed political and legal environment (LP) is in New Zealand (8.8), Switzerland (8.67), Denmark (8.6), the least in Venezuela (1.75), the Republic of Chad (2.38), Ukraine (2.43). The average value in the OECD countries is 7.4, in non-OECD countries with high income – 6.3, in resource countries – 4.1. The index of physical property rights (PPR) is on average 6.1. Highest values are in Qatar (8.21) and Singapore (8.16), the lowest in Venezuela (3.81) and Zimbabwe (4.12). The average value in the OECD countries is 7.2, in non-OECD countries with high income – 6.7, in resource countries – 5.6. Interestingly, the index of physical property rights in the world is higher than the other two sub-indexes, while in the OECD countries its average score is lower than the average LP and IPR. The maximum value of the intellectual property rights index (IPR) is in the US and Japan (8.63), the minimum value in Bangladesh (2.39), Armenia (2.8) and Azerbaijan (2.85). The average value in the OECD countries is 7.4, in non-OECD countries with high income – 5.7, in resource countries – 4.3. To evaluate the economic growth and well-being, the real GDP has been taken, including per capita and per unit of labour (US dollars, in prices of 2005). Its average values, as well as institutional indexes by groups, are shown in Table 1.

Table 1

Average values by sample

	World average	OECD countries	Non-OECD countries with high income	Resource countries
GDP / population, USD	13319	32321	20791	10464
GDP / labor force, USD	25970	63216	36404	18016
IPRI, score 1-10	5.6	7.3	6.2	4.7
LP	5.3	7.4	6.3	4.1
PPR	6.1	7.2	6.6	5.6
IPR	5.3	7.4	5.7	4.4

Source: World Bank (World Development Indicators); Property Rights Alliance (International Property Rights Index).

To determine the linear relationship between institutional indexes and macroeconomic indicators, a correlation matrix has been constructed (Table 2).

Table 2

Correlation matrix (the coefficients are significant for 1% confidence interval)

	IPRI	LP	PPR	IPR	GDP/labor force, USD	GDP/population USD	GDP, USD
IPRI	1						
LP	0.97	1					
PPR	0.92	0.87	1				
IPR	0.94	0.86	0.79	1			
GDP/labor force, USD	0.87	0.85	0.77	0.84	1		
GDP/population, USD	0.86	0.85	0.78	0.82	0.99	1	
GDP, USD	0.29	-	-	0.35	0.34	0.32	1

Source: World Bank (World Development Indicators); Property Rights Alliance (International Property Rights Index).

The analysis revealed an interesting connection between the estimates of property rights and economic growth and welfare. The correlation coefficient between GDP per worker and GDP per capita of 0.99; these figures are almost completely interchangeable. The relationship between IPRI and GDP per unit of labour is direct and very dense with a correlation coefficient of 0.87, per capita 0.86. This means that a high economic welfare in countries with a developed system of property rights, and vice versa. The sub-indexes of property rights also strongly correlate with welfare indicators. The lowest correlation coefficient with PPR: GDP per capita. – 0.78; GDP per workforce – 0.77. However, the relationship between the volume of real GDP and the effectiveness of property rights is weak – 0.29, and the correlation of GDP with LP and PPR is not significant. This confirms the idea that quantitative economic growth is entirely possible with a poorly functioning system of property rights.

As a variable representing the level of development of human capital, the Human Development Index (HDI) is taken. HDI includes the projected life expectancy and level of education in a country. The index is measured from 0.0 to 1.0 (the unit corresponds to the maximum development of human capital). The average HDI for the sample is 0.76. Since 2015 year the highest index value (0.95) is in Norway, the least (0.35) in Niger. In the OECD countries, the average value is 0.92 (min – 0.84, max – 0.98). In non-OECD high-income countries, the average value is 0.82 (min – 0.73, max – 0.91). In resource-oriented countries – 0.67 (min – 0.32, max – 0.82), that is, human development here is worse than the world average and significantly worse than in developed countries.

Innovation indicators are the proportion of expenditures on research and development in GDP and per unit of labour. OECD high-income countries spend for R&D in average 2.2% of GDP. The highest values for this indicator are in Israel (4.5%), Finland (3.83%), South Korea (3.55%), Sweden (3.51%), Japan (3.36%). The United States ($2,471), Denmark ($2,685), Switzerland ($2,716), Sweden ($2,827) and Finland ($2,920) lead the way in

R&D expenditure per unit of labor. In non-OECD high-income countries, the average R&D expenditure per unit of labour is $265, in resource countries $45.

The correlation between technology development (R&D expenditure), GDP per unit of the labour force and values of property rights indexes were determined (Table 3).

Table 3

Correlation matrix (the coefficients are significant for 1% confidence interval)

	R&D expenditure in GDP,%	R&D expenditure/ labor force, USD	GDP/ labor force, USD	IPRI	LP	PPR	IPR
R&D expenditure in GDP,%	1						
R&D expenditure/ labor force, USD	0.92	1					
GDP/ labor force, USD	0.76	0.89	1				
IPRI	0.75	0.80	0.87	1			
LP	0.72	0.77	0.85	0.97	1		
PPR	0.63	0.70	0.77	0.92	0.87	1	
IPR	0.77	0.79	0.84	0.94	0.86	0.79	1

Source: World Bank (World Development Indicators); Property Rights Alliance (International Property Rights Index).

It can be seen that the share of R&D expenditure in GDP is strongly correlated with R&D expenditure per unit of labour (coefficient 0.92). A high correlation is seen between the expenditure of innovation per unit of labour and the realization of property rights (0.8). An even closer connection (0.89) shows the expenditure of R&D and GDP per unit labour. This connection is entirely expected, since innovations are a key factor in economic development and welfare.

For further research, an econometric study was conducted. Its purpose was to confirm the connection between the effective realization of property rights and economic development. An indirect influence of property rights was expected through a propensity to innovate. Therefore, two equations were constructed: of economic growth and innovation.

The GDP growth per unit of labour is taken as a dependent variable in equation 1, because this macroeconomic indicator is more accurate for assessing change of productivity and welfare population. The regression of data on the model of endogenous growth with four independent variables was constructed: 1) assessment of human capital; 2) propensity to innovation; 3) the saving rate; 4) the rate of population growth, technology improvements and capital depreciation. The Human Development Index had been used to assess a human capital. The propensity to innovation is described by the R&D expenditure per employee. An attempt to include an assessment of property rights showed the problem of multicollinearity, this confirmed the hypothesis that there is no direct impact on economic development.

Then a regression analysis of innovation was conducted. It was expected that the development of the institution of property rights is to explain the propensity to innovate.

Therefore, an evaluation of property rights (index IPRI) is added in equation 2. It should be noted that the standardized coefficients obtained after reducing all independent variables to the same scale are indicative.

Specified models were estimated by linear regression ordinary least squares (OLS). To calculate the regression, the software Stata 10.1 was used. All regressions were tested for multicollinearity, heteroscedasticity and correct specification. Multicollinearity determined by the correlation between independent variables. Heteroscedasticity – using test Broysha-Pagan and Cook-Weisberg. The correctness of the specification was assessed by the Ramsey RESET test.

2.2.2. Model specification

Variables included in the model adequately explain the economic development in the long run. Endogenous growth equation is represented as follows:

$$\ln (Y/L) = \beta 1 \ln (H) + \beta 2 \ln (I) + \beta 3 \ln (s) + \beta 4 \ln (n + g + \delta) + e$$

where Y / L – GDP per unit of the workforce; H – assessment of human capital; I – propensity to innovate; s – saving rate; n – rate of population growth; g – pace of technology improvement; δ – depreciation rate of capital.

The regression equation to test the effect of the institution of property rights on the propensity to innovate is as follows:

$$\ln(I) = \gamma_1 \ln(LP) + \gamma_2 \ln(PPR) + \gamma_3 \ln(IPR) + e$$

where LP (Legal Power) – assessment of the political and legal environment; PPR (Physical Property Rights) – assessment of the specification and protection of physical property rights; IPR Intellectual Property Rights) – assessment of the effectiveness of the intellectual property rights protection system.

3. The Results of Econometric Analysis

Evaluation of the first regression yielded the following results (Table 4).

The index of human development is used as a variable showing the level of development of human capital. The propensity to innovation is described by the amount of investment per employee. In model 2, an evaluation of property rights (index IPRI) is added. It should be noted that the standardized coefficients obtained after reducing all independent variables to the same scale are indicative.

Model 1 generally is representative. F-test rejects the hypothesis of the insignificance of the variables. Determination coefficient is high (95%), the Ramsey RESET test revealed no problems with the model specification, the constant-significant. All independent coefficients turned out to be significant at the confidence interval of 1%.Their comparison shows that the most significant for economic development is the propensity to innovate

(0.69), the development of human capital (0.33), the minimal effect of the traditional variables for the Solow model: savings rate (0.13) and population growth rate, technologies and depreciation (0.08). So, it is obvious that the main engine of economic development in the long term is innovation.

Table 4

Estimation of the model of endogenous growth

Dependent variable: ln(Y/L) Sampling: the whole world Number of observations: 80				
Model	(1)		(2)	
	Coefficients	Standardized coefficients	Coefficients	Standardized coefficients
ln(H)	2.039*** (0.000)	0.325	2.147*** (0.000)	0.342
ln(I)	0.420*** (0.000)	0.692	0.284*** (0.000)	0.468
ln(s)	1.155*** (0.000)	0.128	1.081*** (0.000)	0.119
ln(n + g + δ)	0.543*** (0.009)	0.076	0.282 (0.172)	0.039
ln(IPRI)	–	–	1.328*** (0.000)	0.228
Constant	1.129 (0.210)	.	0.819 (0.349)	.
F-test: p-value	0.000		0.000	
R^2	0.948		0.958	
RESET test: p-value	0.252		0.004	

Notation:
1. three stars *** – variables significant by 1%
2. In parentheses (p-value) –the probability of error in rejection of the null hypothesis
3. dashes–variables not used in the model
Source: The study was performed on the base of source World Bank (World Development Indicators); UN Development Programme (Human Development Reports).

Model 2 attempts to assess whether the institution of ownership has a direct impact on economic growth. We see that R2 has grown by 1% and the coefficient for IPRI is significant. However, the variable (n + g + δ) lost its value, which contradicts the growth theory. In addition, the p-value of the RESET test indicates the problem with the specification. Thus, the direct impact of the realization of property rights on economic development is questionable.

So, testing the first equation allowed us to obtain the coefficients for compiling the model of endogenous economic growth:

$$\ln Y/L = 0.33 * \ln H + 0.69 * \ln I + 0.13 * \ln s + 0.08 * \ln(n + g + \delta) + e$$

All coefficients are significant. The model shows that the most important factor of economic growth is a propensity to innovate (0.69)

To analyze the influence of property rights on the propensity for innovation, a model with three sub-indexes IPRI (model 1) was evaluated, but it turned out that one of the variables is superfluous (Table 5). Therefore, model (2) was evaluated, in which only LP and IPR are independent variables.

Table 5

Evaluation of the innovation model

Dependent variable: ln(I) Sampling: the whole world Numberofobservations:84				
Model	(1)		(2)	
	Coefficients	Standardized coefficients	Coefficients	Standardized coefficients
ln (LP)	3.946*** (0.000)	0.542	4.330*** (0.000)	0.594
ln (PPR)	1.001 (0.507)	0.071	–	–
ln (IPR)	2.267*** (0.004)	0.319	2.324*** (0.003)	0.328
Constant	-3.111 (0.096)	.	-2.019 (0.004)	.
F-test: p-value	0.000		0.000	
R^2	0.786		0.784	
RESET test: p-value	0.334		0.239	

Notation:
1. three stars *** – variables significant by 1%
2. In parentheses (p-value) –the probability of error in rejection of the null hypothesis
3. dashes–variables not used in the model
Source: The study was performed on the base of source World Bank (World Development Indicators); Property Rights Alliance (International Property Rights Index).

Model 1 is generally well describing the factors of propensity of entrepreneurs to innovate. We see that the political and legal environment has the highest standardized coefficient (0.54). Slightly less is the influence of the realization of intellectual property rights (0.32). Physical property rights proved to be insignificant for innovation. Remembering that in countries with a high level of legal protection as well-protected property rights of individuals, it is possible to remove this variable from the model.

The model 2 estimated the impact of LP and IPR on the propensity to innovate. The coefficient of determination is rather high (78%), F-Test and RESET allow to reject hypotheses about the problem with the specification of the model. It can be seen that the propensity of entrepreneurs to innovate is mostly influenced by the political and legal

environment (0.59) and almost twice as weak by the protection of intellectual property rights (0.32).

So, testing the second equation made it possible to create a model of propensity for innovation:

$$\ln I = 0.59 * \ln LP + 0.33 * \ln IPR + e$$

PPR revealed insignificant, LP and IPR – significant. In general, this model confirms the theoretical assumption that property rights have a direct impact on the propensity to innovate. The political and legal environment has the strongest influence, the influence of intellectual property rights protection is half as weak, and protection of physical property rights has no effect at all.

The results allow us to establish the indirect influence of the institution of property rights to long-term growth through the propensity to innovate. Econometric analysis confirms expectations about the non-identical effects of different property rights on economic indicators. The protection of physical property rights does not actually affect the propensity for innovation. Conversely, the protection of intellectual property rights is influenced by a well-developed political and legal environment. It was also found that the economic indicators in the developed countries are more dependent on the protection of intellectual property rights quality than in less developed countries.

4. Transitive Countries and "Selling Resources" Countries as an Object of Applying an Innovative Development Model

The obtained results challenge politicians in countries with transition economies and in "selling of natural resources" countries that are looking for the most adequate legal basis for their economic reforms. However, it should be understood that the development of national legal frameworks cannot be effective without taking into account the economic and institutional features of these countries.

"Resource-selling" countries have a common disease called "the resource curse". The raw material model of development is characterized by a deformed structure of the economy, where the primary industries are dominant. Hence the dominance of resources in the structure of exports and a large dependence from the world market. Resources are moving from the manufacturing sector to the raw material and service sectors, which create a lower value-added. The long-term dependence of the economy on the export of natural resources weakens incentives for the development of manufacturing industries and the creation of new technologies. The competitiveness of other sectors is declining. Outdated industrial capital requires restoration, but a low share of accumulation cannot even ensure the simple reproduction of fixed capital in the manufacturing sector.

The influx of money into the country increases the demand for consumer goods, but their production does not keep pace with rising incomes. This causes inflation, increases in bank interest on loans. The number of employed is reduced in a negative demographic situation, increasing labor emigration and low labor productivity. State spending to support education

and science is declining. The fall in profitability due to the growth of the national currency leads to a reduction in investment and a technological lag. In the long run, the most dynamic high-tech industries are degrading and losing ground.

The problem is compounded when the industry is completely monopolized by the state. The sad experience of Venezuela shows what the state's orientation towards obtaining monopoly rents and redistribution of oil revenues leads to. Instead of wisely disposing of unique opportunities and using oil super profits to modernize the economy, develop high-tech industries, and invest in social projects, a corrupt government prefers to spend raw resources recklessly. Today Venezuela is one of the poorest countries in the world; with a GCI of 41.8 in 2019 it ranks 133rd among 141 countries in the world. Almost all indicators are below average even in their region. The Institution sub-index is 25.7 (with an average of 47.1 in Latin America); Macroeconomic stability – 0 (73.7); Business dynamism – 28.6 (53.8) Innovation capacity – 30.9 (34.3) (World Bank, 2019).

Historical experience shows that countries with developed political and civil institutions, such as Norway and Canada, have chances to overcome "resource problems". A well-developed system of property rights, an independent judiciary, free media and viable political parties counterbalance corruption and abuse.

A different situation is characteristic of transformational countries. A complete change in the social, political and economic structure required the choice of own model of economic development. The post-Soviet countries faced a particularly difficult task, since they had previously been part of the single national economic complex of the USSR. However, they are also moving along different paths of economic reform.

The system of property rights in transformational countries has still not been completed. The ambiguity of the results in Central Eastern Europe and the countries of the former USSR is due to different starting conditions, the degree of integration into the world economic space, and the influence of sociopolitical stereotypes.

In the countries of Eastern Europe, even before the reforms began, there was a sector of small private and cooperative production, which created the basis for the growth of market infrastructure institutions. In the USSR, these institutes at the turn of the 80–90s were created artificially. The founders of most commercial banks and exchanges were large state enterprises and industry associations. In fact, their creation was the beginning of the process of spontaneous privatization of state property, already then called "nomenclature".

Various "voucher" privatization schemes have been applied in the Czech Republic, Romania, Poland and Bulgaria. Almost everywhere, nominal privatization coupons (vouchers) were used, which significantly reduced the possibility of financial fraud with them. The state kept under strict control the process of creating and operating investment (privatization) funds.

In Romania, commercial companies were subject to privatization, whose property accounted for 50% of all national wealth; 30% of the cost of their capital was transferred free to all adult citizens in the form of a certificate of ownership. The remaining 70% came at the disposal of the State Property Fund and were sold out to Romanian and foreign legal entities and individuals within seven years.

The concept of privatization in Hungary evolved gradually. Its formation began within the framework of the previous system, when the development of a social market economy based on a mixed form of ownership was envisaged. The high degree of readiness of the economy and society for radical transformations, laid down by the reformist traditions of the 60-70s of the XX century, has become a prerequisite for a quick and successful start of privatization. In the 80s, almost 75% of the adult population of Hungary was employed in various forms of the "second" economy. The private sector was providing more than 50% of the services to the population, giving 1/3 of the retail turnover.

Unlike other post-socialist countries, privatization in Hungary was based on a fee. The meaning of privatization was seen not simply in a change of ownership, but in the formation of a layer of new owners, capable of responsible and interested actions in order to increase capital. A feature of Hungarian privatization was also the opening of access to foreign capital. He got the opportunity to acquire individual enterprises with one hundred per cent ownership. The circle of enterprises was expanded in the property of which the share of foreign capital can reach 51% or more. As a result, the flow of foreign direct investment (for 1990-2000, $ 24.2 billion) flowed into the Hungarian economy, of which 60% were directed to production.

An important component of the privatization model in the Czech Republic and Slovakia was privatization coupons (vouchers), which were exchanged for shares at an auction. If the demand exceeding the supply, the submitted applications were cancelling, and a new round of sale was carrying out according to the same scheme, but at a higher rate. Thus, the process of concentration of shares of privatized enterprises was completely left to the will of the market. By the end of 1994, about 90% of state property was sold in the Czech Republic. A quarter of the cash proceeds from the sale of shares amounted to a money of foreign investors.

The real content of the changes in the property relations system in the Czech Republic is difficult to determine unambiguously. Investment funds have become the main holders of shares of large privatized enterprises (about 2/3 of the shares). Most funds were controlled by five major Czech banks. The main holder of the capital of these banks was the state. Although after the financial crisis of 1999–2000 the state has reduced its share in the capital of commercial banks, the system of interweaving property rights remains complex and multi-stage.

In Poland, as soon as possible, a small privatization was carried out in trade and consumer services. It covered 60 thousand enterprises; several hundred thousand new private enterprises were also created. Large privatization in the industry was carried out gradually and was limited in scope. The main method of privatizing medium-sized enterprises (with the number of employees up to 500) was a preferential sale to their labour collective. Voucher privatization was also carried out, similar in its model to Czech. About 600 enterprises took part in mass privatization. The shares of privatized enterprises were distributed among 20 national investment funds (60% of the shares), the Ministry of Privatization (25-30%), and employees of the enterprise (10-15%). The share of private enterprises has grown over the years of reform from 28.6% in 1989 to 64.1% in 1997. In the hands of the public sector, less than 30% of the economy remained.

In Bulgaria in 1996-1997 mass privatization of shares of state enterprises was carried out using investment vouchers. 1050 objects were put up for sale; as a result, 14.58% of the assets of state enterprises were privatized (Council of Ministers of the Republic of Bulgaria, 2009). The voucher privatization revealed a number of shortcomings, so in 2002 a new Law on privatization and post-privatization control was adopted. Clear and transparent rules and procedures were regulated for all participants, equality of investors, as well as the profitability of privatization as a prerequisite for sustainable economic development and competitiveness of privatized companies. A public competition and an open auction have become the main ways to sell blocks of stocks and shares of enterprises. 1966 companies with state participation of less 50% were realized in this way, which amounted to almost half of the total number of minority stake sales since the start of privatization.

By the end of 2018, the total amount of privatized fixed assets in Bulgaria amounted to 66.31% of all state assets. Shares of 5,282 state-owned enterprises were sold, including in industry (1,647), trade (1,177), agriculture (622), construction (536), tourism (526) and others. The foreign investors from the Czech Republic, Austria, Belgium, Germany, Spain and other European countries were attracted. Currently, Bulgaria has significantly limited the sale of shares of companies with state participation in capital. Most majority packages are prohibited from being privatized (Council of Ministers of the Republic of Bulgaria, 2009).

The unification of Germany in 1990 led to some fundamental differences in the transformation of the economy of the former GDR. The features of the East German version were: certain political choice in the direction of reforms, decisiveness in privatization, the opportunity to rely on the established legal framework and institutional structures of West Germany. The radical reforms were paid for by the structural crisis of East German industry, which suddenly faced global and fierce competition. The ruin of enterprises, the increase in unemployment, the socio-psychological tension in connection with the emergence of a complex of "second-class Germans" became concomitant phenomena of the initial stage of reform.

Privatization took place in line with three market strategies. The first is the speedy sale of the most efficient, competitive enterprises. The second is the reorganization of "problem" enterprises and their preparation for privatization in the absence of potential investors. And the third is the liquidation of uncompetitive enterprises while maintaining the possibility of their reorientation to new activities. In the GDR, issues of employment rather than social justice in the distribution of public property came to the fore. The main participants in privatization in the eastern lands were West German firms and entrepreneurs.

Thus, in the post-socialist countries, a wide range of forms and methods of privatization were used. The reasons for this were: lack of national capital and limited inflow of foreign capital; a large number of privatized enterprises; underdeveloped institutional environment; the need to eliminate monopoly. Market methods of privatization have been implemented only in the eastern lands of Germany. Hungary, which attempted to carry out privatization on the basis of sale, was forced in practice to introduce "compensation bonds" for citizens who suffered material and moral damage during the years of socialism. In other countries of Eastern Europe, the leadership was forced to use various modifications of the free distribution of property to citizens.

The preferential sale of shares to labour collectives in the countries of Eastern Europe (with the exception of Slovenia) was insignificant. For example, the Czech Republic proclaimed the principle of prohibition of privileges, advantages of some groups of the population over others. Only in the small privatization, labour collectives did be granted to the "first-hand right" at the auction. In Hungary, benefits to labour collectives were reduced to obtaining preferential loans for the purchase of shares. Only in East Germany labour groups had preference if they offered equal conditions with other buyers (a promising development concept, an appropriate price offer, guaranteeing level of employment, etc.).

The active attraction of foreign capital has become a significant financial injection during the years of reform. So, foreign direct investment in 1996-2000 reached $ 15.4 billion in the Czech Republic, $ 2.1 billion in Slovakia, and about 12 billion dollars in Poland. However, foreign capital did not become a locomotive of progress in Eastern Europe. The exception is Hungary, where today every fourth enterprise in the industry is a joint venture. According to analysts, attracting foreign capital to the high-tech industries of engineering and pharmaceuticals was the only way to save them in those conditions (Kolganov, 2005).

Transnational corporations also have a significant impact on the Hungarian industry. With their help a dynamic change in the structure of Hungarian production began and a number of fundamentally new industries were created.

There is an opinion that foreign capital contributed to the formation in transitive countries an industry structure that specializes in relatively simple production that complements the technological chains of more developed countries. The desire of Western investors to monopolize entire industries and eliminate potential competitors was also noted. There is a tendency to export capital through the channels of transnational monopolies (Kolganov, 2005). However, studies show that foreign investments usually bring with them modern technologies, techniques and scientifically established management (Naama. 2011). Cooperation with more progressive foreign partners opens up new opportunities, encourages the search for new ideas and solutions, which in the future helps to bridge the innovation gap.

Unlike the countries of Eastern Europe, where structural reorganization of the economy has become a reality, market reforms in the countries of the former USSR have had heavy consequences. Mass privatization not only did not stop, but also exacerbated the processes of decapitalization of enterprises, the transfer of capital from the real sector to the financial sector, and the flight of capital abroad. The most radical privatization processes went in Moldova, Kyrgyzstan, Kazakhstan, they went slower in Russia and Ukraine (due to a number of large and super-large enterprises), and the slowest in Belarus, Turkmenistan, and Azerbaijan.

Russia has chosen a strategy of mass, rapid privatization. The arguments put forward were: lack of time, political confrontation that could block market reforms, as well as the fear of spontaneous privatization. Her danger was seen in the fact that it was carried out exclusively in favour of the former Soviet nomenclature. (Chubais, 1999).

The privatization process was reduced to formal corporatization, as a result of which the ownership of the enterprises was seized by precisely the nomenclature, against which the

Privatization Program was originally directed. In parallel, there was a process of creating new firms, which quickly formed a layer of small and medium-sized entrepreneurs.

However, the general state of the economy was determined by insider privatization of the bulk of the former state enterprises (about 75%). The redemption by the enterprise staff of a controlling block of shares eliminated the participation of outsiders. Most of the shares were blocked for a long time inside the enterprise – by its staff, who was not ready for control over the management. Corporate governance system as the basis for the successful functioning of modern large industry did not arise.

In Ukraine, during the privatization period, priorities have changed. In 1992-1994 the main goal was to create a market environment and a fair division of property, in 1995 – 1997. Search for an effective owner and the formation of the middle class, since 1998 – attracting investment (State Property Fund of Ukraine, 2019).

Carrying out small privatization in Ukraine is considered the most successful. For 10 years (1992 – 2002), it covered over 68 thousand objects, mostly in the sectors serving the consumer market. At the same time, the process of open corporatization was proceeding rapidly. Privileges and political support allowed many labour collectives to obtain controlling stakes on the basis of a free scheme. The lack of cash injection into production did not contribute to maintaining a competitive position in the market. The further public sale of shares was supposed to change the situation. However, the stock market is still one of the weakest elements of the market infrastructure in Ukraine.

Since 1998, the mass sale of stakes of large enterprises has begun at auctions and competitions. Auctions opened access to participation in privatization of many intermediary organizations – investment companies, funds, trusts, banks, etc. Manipulation of huge amounts of money for speculative purposes, illegal conspiracy about the outcome of the transaction even before it began, and such frauds led to a significant criminalization of the process.

During the years of reform in Ukraine, more than 128 thousand objects were sold, the share of non-state enterprises in the production of industrial products amounted to more than 70% (State Property Fund of Ukraine, 2019).

The year 2018 was a breakthrough for small privatization, which was launched on electronic platforms through the ProZorro system.

In countries such as China and Vietnam, unlike other countries with transition economy, the task of large-scale privatization of the public sector was not posed at all. The change in the ownership structure in these countries was not based on privatization, but on the rapid growth of cooperative and private production on its own basis. The public sector has indirectly served as a source of growth for these sectors. State control over the prices of energy, raw materials and industrial equipment produced in the public sector allowed non-state entrepreneurship, mainly engaged in the production of consumer goods, to obtain a favourable price ratio. At the same time, in these countries, there was a long process of commercialization of state enterprises, decentralization of management with the transfer of management functions to the level of enterprises. Only a few state-owned properties in China were privatized.

As practice has shown, large-scale free privatization has not become a mechanism for "launching" the economy. For a long time, the countries of the post-Soviet space could not get out of the grave crisis. At the same time, the Czech Republic, Slovakia, Poland, Bulgaria, Slovenia, which have limited the possibility of financial fraud with free assets, demonstrate relatively stable economic growth. China and Vietnam, which did not pursue an active privatization policy for a long time, have achieved significant success in economic growth, especially in the growth of the private sector.

Privatization, even if successfully implemented, is only a prerequisite for creating a competitive economy. Privatization did not give impetus to structural adjustment in the countries of the former USSR, since the difference between the restructuring within the framework of a well-functioning market system and the restructuring of the entire system during the transition was not understood. It is very important to realize that privatization is not just a transfer of ownership, but a transition to quality enterprise management (Naama,2012). To reformat the economy in accordance with modern requirements, it is necessary not only the presence of the private sector, but also the conditions for its successful functioning. Competitiveness in the world market is provided by high-tech and high-tech industries, therefore, special attention should be paid to them.

Studies show that "the innovation systems of most low- and middle-income economies have a set of common characteristics: low education levels, low levels of science and technology investments, reduced exposure to foreign technologies, limited inward knowledge flows, weaker science and industry linkages, challenging business environments with inadequate access to financial resources and underdeveloped venture capital markets, low absorptive and innovative capacity within domestic firms, and limited use of intellectual property". To launch an innovative development model, an active state policy is needed. It can be carried out according to various scenarios:

1) by significantly strengthening the role of the state in the economy through state lending, the provision of tax benefits to priority sectors, protectionist policies. However, in the conditions of high corruption and low competence of officials, the opposite effect occurs: theft of funds, support for inefficient enterprises and, as a result, a decrease in the living standard of the population.

2) by improving the institutional environment: reliable protection of property rights including intellectual; favourable legal environment (patent law, standardization and certification system); ensuring equal conditions for competition; tough antitrust policy; active fight against corruption.

At the same time, formation of communicative competence and effective education system should be supported (Luchaninova et al., 2019), and information and innovation infrastructure (business incubators, technology parks, venture funds etc.) should be developed.

Conclusion

Theoretical and empirical analysis has shown that the institution of property rights can have a different impact on economic development. If it does not correspond to the nature of productive activity, it becomes an obstacle to technological progress. When the productive forces reach a higher level of development and a new production factor becomes widespread, there is a need to regulate its use, and this requires the introduction of adequate legal norms. Moreover, it is necessary to understand that it is impossible to establish a unified system of property rights for all countries. The system that is optimal for a developed country may be too expensive to a developing country, and vice versa. Similar conclusions regarding the degree of protection, in particular intellectual property rights, take place in scientific discussions.

In our opinion, the problems of IPR protection, as well as rent-seeking, are resolved by improving the legislative framework and the executive mechanisms. In addition to improving general formal rules, such as the independence of the judiciary, the rule of law, political stability and the control of corruption, this may target changes in legislation[6].

An indicator of the relevant institutions of property rights to economic development is the innovative activity in the country. Between institutions and innovation, there must be a rigid complementarity, similar to that described by Greif and Mokyr (2015), characterizing the industrial revolution in England. At the present stage, clear specification and protection of intellectual property rights are important conditions for economic development. The conclusion that effective implementation of this institution depends on the quality of the political sphere poses an important question about the reliability of the prevailing approach based on a simple unification of countries with different institutional frameworks under one umbrella in analyzing their impact on economic development. This approach may give inconsistent and misleading results and lead to false conclusions and improper policy. The inclusion of intellectual property rights protection in the equation of economic growth will allow to take into account the important institutional determinant of innovation development.

Objections to its excessive protection will disappear if the political and regulatory environment promotes competition in the spirit of "creative destruction. "The growing scientific and technological progress continually offers new intelligent products that quickly eliminate the monopoly profits. Government's main objective should be in the formation of a political and legal environment that will create optimal conditions for the development of intellectual entrepreneurship. This will allow each country to build its own model of an intellectual-oriented economy.

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[6] For example, reducing the term of the patent or the prohibition of patenting individual intelligent products. Such precedents already exist. So, in 2012, Google, Facebook and other IT companies called for the prohibition of patents on "abstract ideas", and from 2013 in New Zealand is legally prohibited from patenting software, available at: http://www.panarmenian.net/eng/news/136695/; https://en.wikipedia.org/wiki/Software_patent

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MARKETING COMMUNICATION PRACTICES IN BULGARIAN HIGHER EDUCATION

*This study presents the results from the second end-stage of a project on the topic of "Marketing Communication and Developing Competitive Advantages in Higher Education", financed by the "Scientific Research" fund at Plovdiv University "Paisii Hilendarski" for the period 2017-2018. **The main goal** of the conducted empirical research is describing and comparing communication practices and activities by the Bulgarian state higher schools and universities in relation to their target groups – candidate students, current students and employers. **The object** of study are the public higher schools and universities operating on the territory of the Republic of Bulgaria. **The subject** of study is the marketing communication as a factor in building competitive advantages by Bulgarian higher schools and universities. Questionnaires were prepared and distributed online among experts in the statistical units in order to solve the posed research problems. Among the significant conclusions derived from the results are that surprisingly larger high schools rarely have their written communication strategy and medium and smaller ones seem to be more engaged with active strategic marketing communication planning; only 1/3 of higher schools are trying to track and evaluate the impact of marketing communication in changing their reputation what should be one of their long-term communication goals if planned effectively.*
JEL: M31; L22

1. Introduction

A number of researches around the world are dedicated to marketing communication in higher education. For instance, D. Schüller and V. Chalupský in "Marketing Communication Management in Higher Education" analyse how marketing communication activities are managed at public universities and their economics faculties in the Czech Republic. They reach the conclusion that many Czech universities do not have a systematic management procedure for marketing communication planning and control. Furthermore, there are several areas in the marketing communication management of higher educational

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institutions which should be substantially improved upon (Schüller and Chalupský, 2012). L. Youngah focuses on a specific target group in relation to the universities' marketing efforts – future students' parents. She explores how university communication influenced parents' attitude and reputation perception. Through in-depth interviews with 29 parents, Youngah makes a conclusion that a university's strong organizational identity and culture, communicated through the internal stakeholders' experience can significantly influence prospective parents' favourable cognitive and behavioural intentions (Youngah, 2019). Other authors focus on analysis and evaluation of the meaning and emphasis of integrated marketing communication upon higher educational institutions (Horrigan, 2007; Edmiston, 2009; Popovic, 2015; Smedescu, Ivanov and Truth, 2016; Harjadi and Fatmasari, 2017).

In Bulgaria, the problem of marketing communication (as part of marketing efforts) in higher schools and universities (HSU) is scarcely researched. This is in part due to the system of higher education (SHE) in Bulgaria which is sometimes defined as bureaucratic, exceptionally sluggish, closed, etc. However, the subject is certainly intriguing and contemporary when factoring in the necessity to overcome communication barriers between HSU and interested parties (stakeholders, target groups). The transition from planned to market economy turned SHE from centralized to highly accessible and market-oriented. At the very beginning, HSU marketing was not the focus of attention and could be described as more sporadic, undecided and random. Furthermore, some higher schools calmly followed the worn path of timelessness, leaning on past accomplishments, i.e. they were confident in the traditional preference of candidate students. But the realization did come. Whether the process went on too slowly and why the system finally "awakened" are questions which can be the centre of later researches. What is clear is that in the reality of 51 active (accredited) public universities and other higher schools, Bulgarian higher education institutions cannot remain passive and wait for the old times to make a comeback. They naturally realized the necessity of accepting a new different logic of regulation which is expressed in preaching and professing the so-called marketing concept at all stages and in all directions.

This current study presents the results from a conducted research which sought answers to questions such as:

- *Do HSUs have planned communication strategy* (on an all-university and/or faculty level)? And if they do, is *that strategy publicly accessible; who developed it; are communication activities of the different faculties synchronized* by an all-university supervisor?

- *Do HSUs employ an authorized person (team) dealing with marketing communication* in all its complexity?

- *Do HSUs employ a designated communicator* (PR, media expert, contactor, etc.) with mass media?

- *Do HSUs conduct monitoring on their marketing communication and what evaluators do they use* in order to evaluate their communication activities?

- *With what intensity do HSUs spread information* to their target groups?

- *What are the most important communication channels* that HSUs use in their attempts to reach their target groups?

- *What are the expected results of the HSUs' communication activity*?

1.1. *System of higher education in Bulgaria*

The system of higher education in Bulgaria is defined by the impact of the so-called managed competition which effectively means the state's interference in the overall functioning of the public service market, such as:

- Control over the admission of students and doctoral candidate;

- Determining the type and number of prioritized professional profiles and protected majors in state higher schools;

- Laying out the nature of effectiveness of state subsidy (Law for higher education in Bulgaria, Art. 90 and Art. 91);

- Normative obligation of higher schools and education to be accredited to the National Agency for evaluating and accreditation under a unified criterion system, etc.

In other words, the academic autonomy of higher schools which the state warrants (under the Law of higher education under Art. 8) can be qualified as partial – a circumstance which significantly narrows the scope of successful application of the traditional marketing approach in relation to such an *unorthodox* market. Naturally, here must be pointed out some of the arguments *in support* of the state's interference in the administration of higher schools because the continuing existence of such interference is beneficial (Dimitrova, 2018):

- *The presence of outside effects related to the development of higher schools*. Investments (specifically – state subsidies) in higher education enable such positive effects with decisive importance in the socio-economic development of the basics of knowledge.

- *Providing equal access to higher education*, regardless of ideologies, religion and political doctrines and not allowing discrimination based on gender, age, race, ethnical or social background, nationality or any other privileges.

- *Providing care for the quality of training* of specialists with higher degrees. The state's vision to warrant and constantly improve the quality of higher education is materialized through the realization of the adopted "Strategy for development of higher education in the Republic of Bulgaria for the period 2014-2020"; the functioning of the specifically created National Evaluation and Accreditation Agency (NEAA); the adopted amendments to the Law for higher education and Law for development of the academic personnel; normative required implementation of an internal system for evaluation and control maintenance and the academic personnel in higher schools; the developed rating system for HSU in the country, etc.

- *Supporting "non-profitable" sciences.* The market is impartial to some sciences which are not "profitable". Physics, Chemistry, Biology, et al., despite their indirect application in the "useful" production activities (gaining profit) are effectively not the focus of private investment interests (seeking profit). The state remains the "naturally existing" defender of non-profitable (protected) sciences.

- *Correcting the markets' asymmetricity.* Besides everything else, the state turns into a corrective of the infamous "asymmetricity" of markets. This realization is present from J. M. Keynes (albeit in a different state) to J. Stiglitz (in the explicit state). If capital markets were perfect, the people for whom education would be a good investment would have a reasonable-enough motive to take loans in order to finance the acquisition of higher education. But private investors would not accept a mortgage in the form of an expected higher education diploma. Thus, the people who do not have sufficient funds, albeit capable enough, would in effect not have access to higher education. That is, unless the support comes from… exactly the state.

1.2. *The research*

A team of professors at the Faculty of economic and social sciences (FESS) at Plovdiv University "Paisii Hilendarski" conducted an empirical research which had its pilot phase in the period December 2017 – April 2018 as part of a project on the subject: "Marketing communication and building competitive advantages by higher schools". Among the more important results from that initial phase are:

First, a comparative theoretic analysis was conducted of publications, devoted to the categories *marketing communications, competitive advantages, competitiveness*.

Second, an analysis was made on the current state and tendencies were drawn out for the development of the system of higher education in Bulgaria.

Third, a methodology was developed for monitoring (analysis and scanning) of *communication practices and activities in Bulgarian higher schools and universities*.

Fourth, pilot information was provided for the role and importance of marketing communications conducted by state higher schools and universities with a capacity of over 9000 students.

Factoring in the aforementioned, changes were made in the suggested methodology and developed tools. Part of the formulated work hypotheses were modified and a new one was formulated (see the second hypothesis).

This current study presents the results obtained by the second end-stage of the research which was realized in the period January 2019 – May 2019.

The main goal of the research is to describe and compare the communication practices and activities in Bulgarian higher schools and education in relation to their target groups – candidate students, current students and employers. **The object** of the research are public higher schools and universities operating on the territory of the Republic of Bulgaria. **The**

subject – marketing communication as a factor for building competitive advantages for Bulgarian higher schools and universities.

The presented main goal of this second phase was specified with the following **tasks**:

1. To provide information for the role and importance of marketing communication in the process of developing competitive advantages to the remaining higher schools and universities operating in the country.

2. To draw the parameters of the successful marketing strategy of Bulgarian higher schools and universities.

The verifiable (by using the data from the conducted research) **research thesis** is: *In Bulgarian HSU the role, position and scope of marketing communication are developed to a different extent and this is dependent on the capacity and width of the product mix and the adopted management practices*.

When put in this way, it can be specified through the following hypotheses:

First hypothesis: Under the conditions of intense competition among higher schools and universities the three leading inherent competitive advantages will turn out to be "Positive brand image", "High quality of the offered education", "Good HSU education on the labour market".

Second hypothesis: The five types of higher schools and universities differ in the evaluated importance of the inherent competitive advantages.

Third hypothesis: HSU do not possess a drawn-out communication strategy.

Fourth hypothesis: HSU have a designated main communicator (their own team) dealing with marketing communication.

Fifth hypothesis: Public relations are the most widely used communication tool by HSU.

Sixth hypothesis: There is a directly proportional relationship between the width of the product mix of the HSU and the number of indicators for evaluating marketing communication effectiveness.

The research was realized under the following acknowledged limiting circumstances:

First. In the scope of the research fall only the state higher schools and universities (SHSU) in Bulgaria due to the condition that depending on the form of ownership Bulgarian higher schools and universities differ in their financing mechanisms.

Second. Outside of the methodological frame of the research is the competitive placement of higher schools and universities in Bulgaria depending on the marketing communications utilized by them.

In order to solve the posed research problems, online questionnaires were delivered among experts in the statistical units. For each statistical unit, only one participant was chosen who is responsible for the HSU's marketing communications.

The exact definition of the target population was realized with the help of data from the social statistics of the National statistical institute (NSI) and Reports of the National Evaluation and Accreditation Agency (NEAA) for institutional accreditation of higher schools and universities.

From Table 1 it becomes obvious that during the 2018/2019 school year there are 37 higher schools in Bulgaria.

Table 1

Higher schools by type and ownership in Bulgaria

Type and ownership	2018/19 (number)
Total	54
Universities and specialized higher schools	50
Independent colleges	4
Colleges in the structure of universities and specialized higher schools	17
From that number of private higher schools	17
Universities and specialized higher schools	13
Independent colleges	4
Colleges in the structure of universities and specialized higher schools	–

Source: National statistical institute, 2019.

For the goals of this current research a grouping of state higher schools has been suggested in five types according to their capacity (Table 2): **largest state higher schools** with a number of students over 20000; **large state higher schools** with 14000 – 19999 students; **medium state higher schools** with 9000 – 13999 students; **small state higher schools** with 4000 – 8999 students; **smallest state higher schools** with 850 – 3999 students. From the thusly defined population is excluded the Dimitar A. Tsenov Academy of Economics in Svishtov because at the time of the research it was discovered that the Decision of the Accreditation Council to NEAA from 16.11.2017 for institutional accreditation has not yet been enforced due to it being legally contested.

Therefore, the volume of the target population for the current research consists of 36 statistical units and the registered information covers 30 units, i.e. it can be considered that the conducted observation has a representational value.

Table 2

Distribution of higher schools by type

Type	State higher schools	Capacity
Type I **LARGEST SHSU** over 20000	Sofia University "St. Kliment Ohridski"	37000
	University of National and World Economy – Sofia	27340
	Plovdiv University "Paisii Hilendarski"	22750
	Technical University of Sofia	21215
Type II **LARGE SHSU** 14000 – 19999	South-West University "Neofit Rilski" – Blagoevgrad	19600
	"Angel Kanchev" University of Ruse	19555
	"St. Cyril and St. Methodius University of Veliko Tarnovo	17368
Type III **MEDIUM SHSU** 9000 – 13999	University of Economics – Varna	13000
	"Konstantin Preslavsky" University of Shumen	12000
	Technical University of Varna	11000
	Medical University – Sofia	9770
	Trakia University – Stara Zagora	9435
Type IV **SMALL SHSU** 4000 – 8999	Technical University of Gabrovo	8000
	"Nikola Yonkov Vaptsarov" Naval Academy – Varna	6500
	University of Architecture, Civil Engineering and Geodesy – Sofia	6350
	University "Prof. D-r Asen Zlatarov" – Burgas	5875
	University of Food Technologies – Plovdiv	5500
	Medical University of Plovdiv	5185
	University of Chemical Technology and Metallurgy – Sofia	5000
	Medical University – Varna – "Prof. Dr. Paraskev Stoyanov"	4800
	University of Forestry – Sofia	4600
	University of Mining and Geology "St. Ivan Rilski" – Sofia	4400
	Agricultural University – Plovdiv	4200
	"Vasil Levski" National Military University – Veliko Tarnovo	4200
	National Sports Academy "Vassil Levski" – Sofia	4000
Type V **SMALLEST SHSU** 850-3999	"Todor Kableshkov" University of Transport – Sofia	3700
	University of Library Studies and Information Technologies (UNIBIT) – Sofia	3400
	Medical University – Pleven	3230
	Ministry of Interior Academy – Sofia	2000
	VSU "Lyuben Karavelov" – Sofia	1800
	University of Telecommunications and Post – Sofia	1620
	National Academy of Music "Prof. Pancho Vladigerov" – Sofia	1600
	"G. S. Rakovski" National Defence College – Sofia	1400
	National Academy of Art – Sofia	1200
	Academy of Music, Dance and Fine Arts – Plovdiv	1060
	"Krastyo Sarafov" National Academy of Theatre and Film Arts – Sofia	850

Source: National Evaluation and Accreditation Agency, 2019.

2. Results

2.1. *Competitive advantages*

From the very start the research tests to what extent higher schools recognize and want to develop competitive advantages related to social prestige and brand value compared to possessing advantages having to do with the specifics of the educational product itself. It should be noted that even though the *high quality of the education* is a leading competitive advantage for 2/3 of the higher schools, 60% of them rely primarily on the *positive brand image* and *good reputation on the market of labour* (Figure 1). In other words, two of the three main competitive advantages for educational institutions have to do exactly with building a positive public image. Competitive advantages having to do with specific attributes of the product itself (rich product portfolio, effective pricing policy) are left trailing.

Therefore, the **first hypothesis** that in the circumstances of high competition among higher schools, the three main competitive advantages will turn out to be "Positive brand image", "High quality of offered education", "Good reputation of HSU of the labour market" is **thoroughly confirmed**.

Figure 1

Most important competitive advantages that higher schools possess
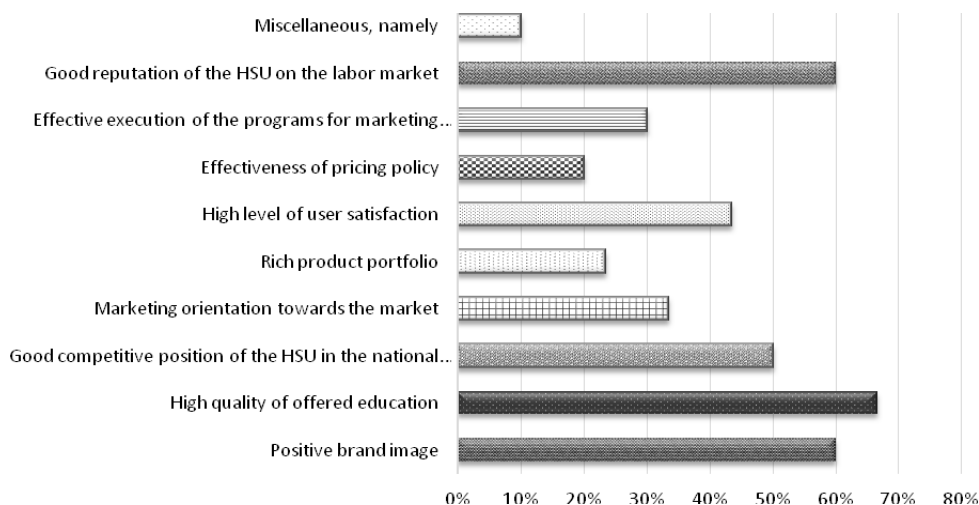
For the analysis of the **second hypothesis,** the non-parametric test of Kruskal-Wallis is applied, which is analogous to the single-factor dispersion analysis of range data. The reason for choosing this test is the necessity of statistical analysis of ordinal variables. As a *post-hoc* analysis, Dunn's test is applied for pairwise comparison. The used technical tools are SPSS and Python.

The variable "Type of HSU" is considered a feature factor with five levels. For a dependent feature is used the individual mark for the 9 different competitive advantages.
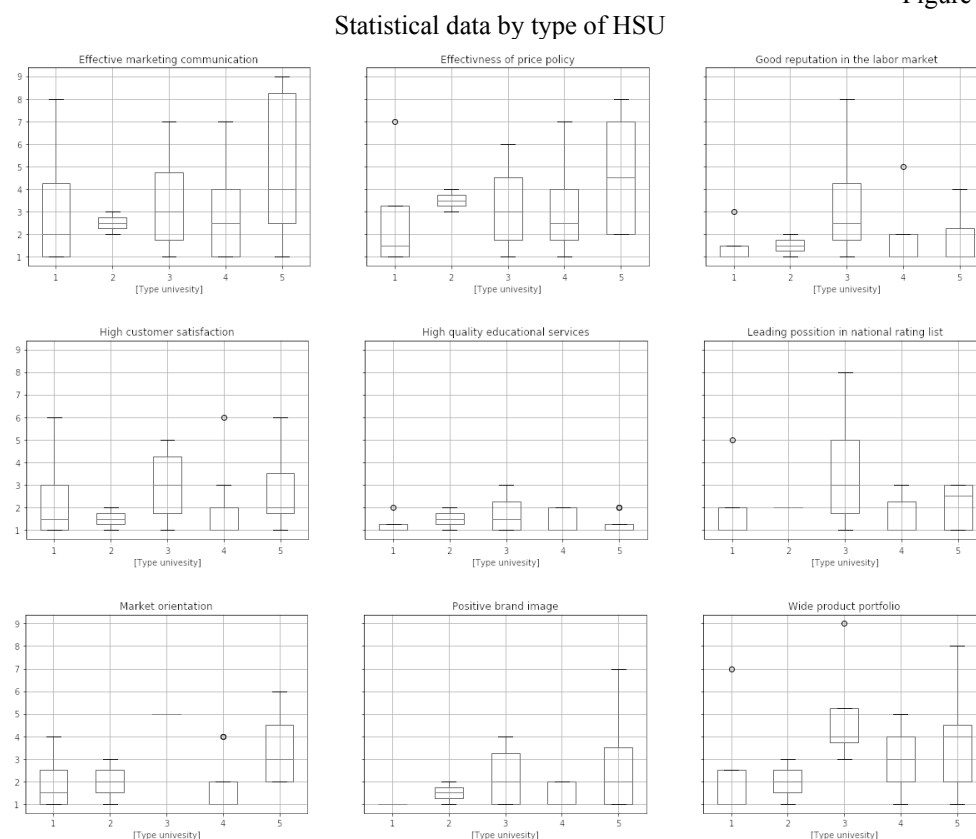
For each competitive advantage, the following working hypotheses are defined:

H0 – no statistically significant relation exists between the feature type of HSU and the mark for inherent competitive advantage

H1 – the relation between type of HSU and the mark for importance of inherent competitive advantage is statistically significant.

The accepted level of significance is $\alpha = 0.05$.

Figure 2

Statistical data by type of HSU

Summarized statistical information for the researched parameter "mark for the importance of inherent competitive advantages" on type of universities for each competitive advantage is shown in Figure 2.

In Table 3 is given data from the application of the Kruskal-Wallis test for finding a significant relation between the independent variable Type of HSU and the corresponding competitive advantage.

Table 3

Values of p-value in Kruskal-Wallis

Competitive advantage	P-value
Good competitive position of HSU in the national rating system	0.4112
Marketing orientation towards the market	0.0067
Rich product portfolio	0.2284
High quality of the offered education	0.8151
Positive brand image	0.1952
High level of user satisfaction	0.5402
Effectiveness of pricing policy	0.4715
Effective execution of the programs for marketing communication	0.7004
Good reputation of the HSU on the labour market	0.5229

The results in Table 3 and more specifically the significance of 0.0067 confirm the presence of a significant statistical relation between type of university and the evaluation of competitive advantage "Marketing orientation towards the market". This gives us reasoning to reject the null hypothesis for this variable.

To find out which groups of type of HSU differ, a pairwise analysis using Dunn's test is conducted. The results are shown in Table 4.

Significance values are adjusted by the Bonferroni correction for multiple tests. The value 0.012 of adjusted significance shows a significant difference between type II and type IV of the HSU types.

Table 4

Pairwise statistical analysis

Pairwise type HS	Test Statistics	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
4 – 2	16.042	4.942	3.246	0.01	0.012
4 – 5	-9.729	3.907	-2.490	0.013	0.128
1 – 2	-14.625	6.052	-2.416	0.016	0.157
3 – 2	14.250	7.412	1.922	0.055	0.545
1 – 3	-3.75	7.412	-0.51	0.960	1
4 – 1	1.417	4.942	0.287	0.774	1
1 – 5	-8.312	5.241	-1.586	0.113	1
4 – 3	1.792	6.537	0.274	0.784	1
5 – 2	6.312	5.241	1.204	0.228	1

The results of the applied statistical analysis show that there is a statistically significant relation between the feature "Type of HSU" and the dependent variable "Marketing orientation towards the market". These results confirm the **second hypothesis**, although not for each of the competitive advantages.

2.2. *Communication activity and expected results*

It was entirely expected for researchers that *increasing the interest in candidate students and parents* is the most desired result from higher schools' communication activity. This is true for 86,7% of respondents in the research (Figure 3). It is not surprising that of highest importance is one "speed" indicator which can appear quickly after a certain communication activity and can also be measured and observed through specific indicators. Still, looking for quick effects is very common for marketing communication. In this case, however, it should be noted that over 73% of respondents were not aware of the meaning of marketing communication for maintaining one constant attribute of higher schools – their *good reputation*. It should not be underestimated that exactly half of the participants in the research think that through their communication activity higher schools can consistently and reliably change the society's attitude towards the necessity for higher education and its quality. This is exactly what should be their leading long-term goal in the area of communication.

Figure 3

Most important expected results from communication activity in higher schools
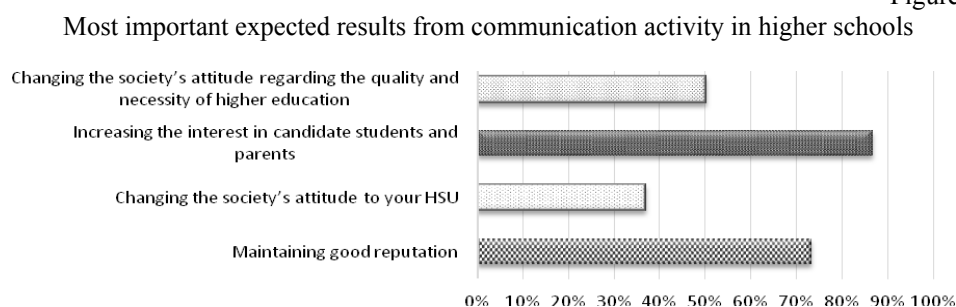

2.3. *Communication practices*

In relation with the execution of the set goals in the research, information was gathered about the methods and tools which higher schools use to obtain the desired communication results. It is well-known that in theory and practice of public relations (PR) a leading role is given to the marketing communication mix. For instance for Thomas Harris, management consultant at Thomas L. Harris & Company, educator, former president/partner of GolinHarris and author of the first book on marketing public relations (MPR), the function of public relations is far from simply supporting marketing and management. The PR legend states that: "…public relations plays a critical role in integrated marketing" and "…PR can add value to an integrated marketing communication (IMC) program", i.e. PR is a leading component of IMC (Harris, 1998, p. 322). Patrick de Pelsmacker, Maggie Geuens

and Joeri van den Bergh also believe that "PR plays a vital role in integrating the company's communications efforts" (Pelsmacker, Geuens, Van den Bergh, 2007, p. 291).

Similar leading role for PR can be found in this current research. Among communication tools used by higher schools, exactly the *public relations* possess a serious advantage. They are applied *always* in 73,3% of the time (Figure 4). Thus, the results inarguably **prove** the drawn-out **fifth hypothesis** of the current research.

Regarding *advertising*, this is valid among exactly 1/3 of respondents. After PR, ordered by frequency of application, come *personal sales* (43,3%) under the form of presenting the higher schools' advantages in front of the different target groups, providing the opportunity for communication, attending high schools, getting advice when applying, etc.

Figure 4

Frequency of application of communication tools (always)
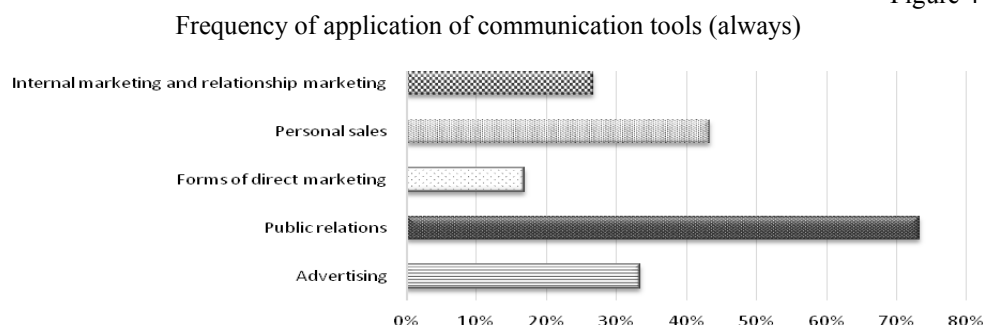
The lowest frequency of application is that of *direct marketing* (16,7%) as well as *internal marketing and relationship marketing* (26,7%) through communication stimulation of employees, professors, current students and leaders of the public opinion in order to attract more candidate students.

From the results become obvious ignoring the forms of direct marketing (e.g. by email, phone, through a catalogue…) even though it allows for very good user targeting and even personalization through the separate channels but requires excellent targeting by preset address lists and databases in order to be more effective. Still, higher schools could apply it more often considering its low cost and excellent selectiveness in terms of communication channels.

The leading importance of PR for higher schools has already been proven. Furthermore, it turns out that HSU rely more on the direct influence of this communication tool than on media. Half of the respondents say that among their PR activities the leading ones are: *organizing special events – open days, scientific forums, conferences, Olympiads and award ceremonies, etc.* which are used to reach directly their target groups (Figure 5).

Figure 5

PR activities for higher schools
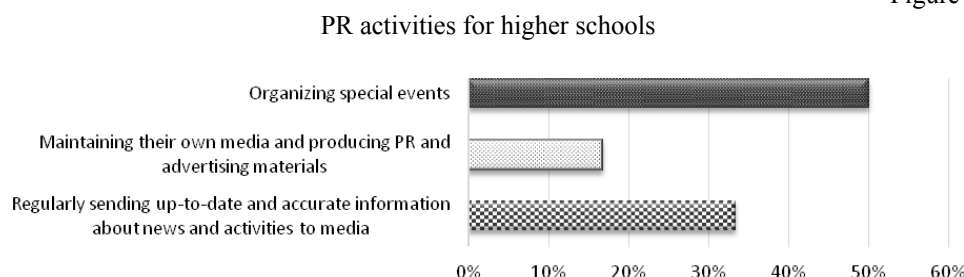
Barely 1/3 of participants in the research *regularly send information to media regarding news about their activity,* and even smaller is the percentage of those who recognize it as a PR goal *to maintain their own media and produce information materials.* However, this is not true for advertising. This is where own materials are preferred by higher schools, with 80% of them printing out *their own advertising brochures, pamphlets, flyers, catalogues* (Figure 6). In second place among preferred advertising channels come *social media* and *internet media (sites, blogs, etc.)* – respectively for 63,3% and 50% of respondents. Close to modern media come *traditional electronic media* with a result just below 50%. *Print media* are least preferred in only 16,7% of the time.

Figure 6

Used communication channels in the realm of advertising (always)
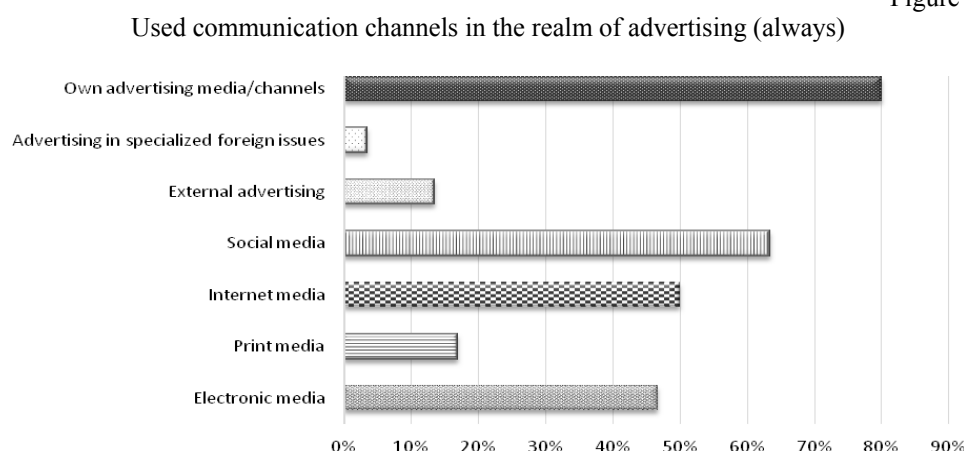
In relation to the most important communication channels that HSU rely on, a number of important dependencies stand out (Figure 7). *Newspapers and magazines* are the most important communication channel for 20% of HSU in their attempts to reach candidate students, graduated students and employers. A similar situation is observed with *radio and television.* The result of traditional media is closer to 25% for communication intentions regarding the graduated students and student candidates. One can conclude that there is a tendency for ignoring *traditional media* at the expense of *internet websites, social media,*

own media and the efforts for direct spread of information under the form of *special events*. Such ignoring should not occur because for instance, even with a decrease in sales, print has the feature of durability, can be read by multiple people, can determine topics for electronic media due to its analytical nature and depth. Regional papers, despite their lack of specialized content, have the power of covering the geographical target group and reaching a more heterogeneous audience, including parents and employers who can influence the candidate students' choice. Radio and television are quick and practicable. They are suitable for reaching a wider audience which is bound to include people from businesses, a number of graduated students, even student candidates (given a suitable media planning of communication activity).

Figure 7

Most important communication channels used by higher schools
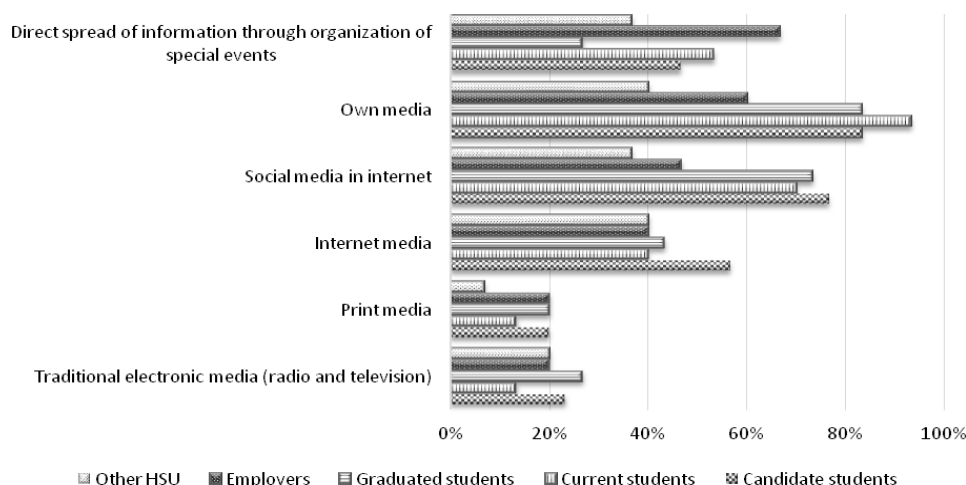
In their desire to reach candidate students, higher schools most often rely on *their own media* (83,3%) as well as *internet social media* (76,7%). *Internet media* are the most common tool for communicators 56,7% of the time, and almost 50% is the share of direct communication through organizing special events. It becomes obvious that preference towards *own controlled media* is dominant above non-controlled media. This hegemony reaches nearly 95% when factoring in contacts between educational institutions and **their current students.** In the frame of the pilot phase of the research, interviews were conducted with 10 of the leading schools, with 100% of participants declaring that they maintain their own web page on the internet (in some cases separate faculties also have specialized web sites). In 40% it is combined with a Facebook page. Other 40% declare that they own a newspaper or a magazine, 50% – informational video systems, one of the universities has their own television and radio. 80% of polled HSU have more than one own media, 50% possess three or more. Of course, higher schools rely on the spreading of information to regional and national media (with most admitting that internet media are

most important to them) and only one higher school answered that they do not hold targeted communication with mass-media. It was difficult for interviewers to evaluate the ratio between the usage of own and external media which is of big importance since non-controlled MMC reach a much wider audience.

Another important conclusion stands out – realizing the need for direct communication with target groups where the different forms of media are not mediators. Communication efforts through organizing *career forums, presentations, open days and other special events* supersede or approach in frequency and importance contact with traditional and internet media in relation with three of the researched target groups: employers (nearly 70%), current students (53,3%) and candidate students (just below 50%). Data shows that there is the belief that special events could perform functions which are not inherent to media communication channels and marketing communication tools such as advertising and PR through the means of mass communication.

Communication efforts of participants in the study are the least intensive in relation to **other higher schools** – barely 13,3% of respondents *regularly* spread information to other HSU (Figure 8).

Figure 8

Intensity of the spread of information to target groups
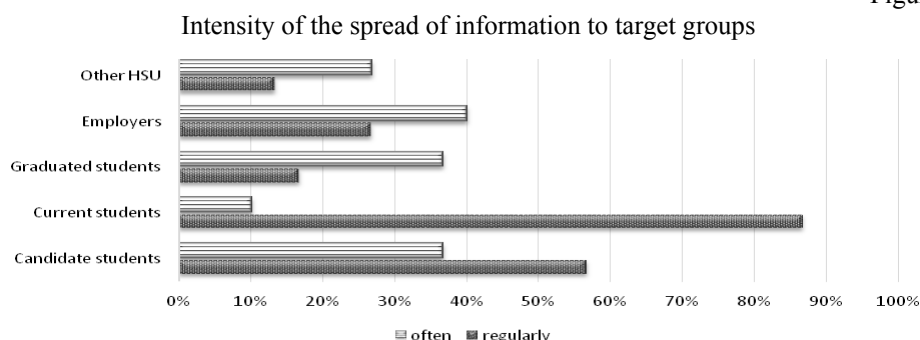
And while different HSU communicate irregularly among themselves, their contact with **employers** can be defined as *frequent* for 40% of them.

It turns out that the higher schools most often communicate not with their candidate students but with **current students**: 56,7% versus 86,7%. Of course, with the adoption of a more market-oriented approach this result, along with the communication with future users of the educational product, would change. So, in the future, higher schools should fine-tune their activities in relation to this target group.

2.4. *Planning and organizing communication activities*

An extremely interesting result can be observed in relation with the *presence of a planned communication strategy* by higher schools. Unlike the pilot phase, where only two HSUs had a planned communication strategy, here most of the respondents have one. This result

is in practice due to the inclusion of SHSU of types four and five (20 of them), 70% of whom declare to possess such a strategy.

A conclusion can be reached that **80% of SHSU of types one, two and three** (*largest, large* and *medium* state higher schools) **do not have a planned communication strategy, and 70% of SHSU of types four and five** (*small and smallest* state higher schools**) have one**. Of course, it is logical to ask why such a difference exists and what competitive advantages are provided by the presence of active marketing planning.

53,4% of all participants in the research have a planned communication strategy. Therefore, the formulated **third hypothesis** in this current research **is partially confirmed**.

Nearly 80% of the respondents share that their educational institution *has a designated person (team) dealing with marketing communication in its complexity*. This shows that the need for their own designated specialist/team, dealing with marketing communication, is understood and preferred to the alternative – using services of an outside marketing agency, dealing with communication activities.

Therefore, the drawn-out **fourth hypothesis** is **partially** confirmed.

2.5. *Evaluation of marketing communication effectiveness*

The subject of getting feedback on the relation from marketing communication and the control function in this process is complex and multi-layered in each organization due to different barriers in evaluating communication activity effectiveness. There are at least two reasons: the multiple factors of influence and the difficulty to isolate the influence of separate tools and determine the relative "weight" of their role. Evaluating the different levels on which communication works is also problematic which is demonstrated by the respondents in the current research.

26 of 30 higher schools participating in the research state that they *perform monitoring of marketing communication.* 13,3% are not interested in feedback from the process. The main indicators of this effectiveness among respondents which stand out are (Figure 9):

- Increasing awareness of different parameters of the work of HSU and the level of interest in candidate students in relation to a past period – these factors are most important to 70% of respondents;

- Degree of trust in the presented information – 63,3%;

- Degree of satisfaction by different target groups from communication with HSU – 63,3%

- Evaluation and degree of interest by the recipients in their own media: bulletins, newspapers, blogs, social media pages, internet sites... – 60%.

Inarguably the indicators pointed out as most important are not to be ignored but it is surprising that only 1/3 of higher schools are trying to track the influence of marketing communication in *changing their reputation*. And this is precisely what should be one of their long-term communication goals if planned effectively. There are different possible

explanations, such as higher schools do not know suitable tools for researching such dependencies or such research is above their means in terms of human and financial resources. Another conclusion that can be made is that less than half of HSU (43,3%) rely on their communication activity in climbing up *rating standings*. It can be summarized that with evaluating their communication activity higher schools focus their attention on parameters that are somehow closer and comprehensible at the expense of indicators that (albeit more slowly and difficult) would provide useful information for their activities in the sphere of communication.

Figure 9

Measures for evaluating marketing communication effectiveness
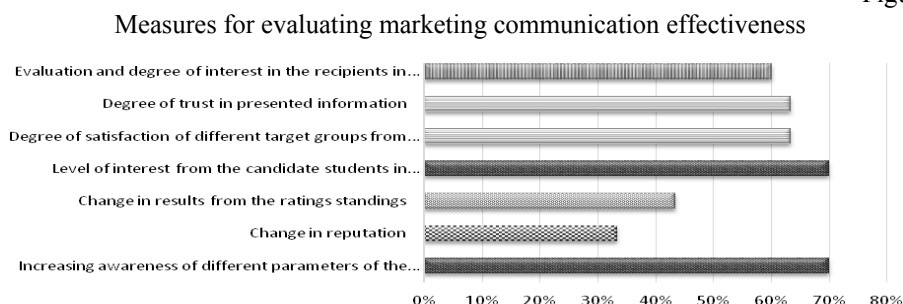
As for the level of evaluation for communication effectiveness, there is again contradiction and insufficient knowledge of the ability and tools that can be used to perform such control functions. 70% of respondents declare that they track marketing communication effectiveness on all levels – *preparation, implementation* and *impact/influence*. Similar is the share of those who trust most often media monitoring for performing this control but this tool by itself cannot provide sufficient information for the complete results of communication activity. The fact that they appeared in the media cannot help higher schools to analyze the objective results of their communication efforts. In the meantime, barely 1/3 of all HSU (most often) *collect and analyze the quantity and quality primary data from students, parents, employers and participators in forums* in order to trace the real influence of their activity (Figure 10).

40% of respondents say that they use *content analysis* (including of blogs, chatrooms, forums, social networks) and even fewer (only around ¼) – *analysis of specialized researches and data from educational institutions*. To more than 2/3 of the participants in the research *media monitoring* (press clipping) remains the main (and sufficient) way of getting feedback from marketing communication. It is undisputed however that it is not possible to judge by the collecting and storing of media publications for the real influence of communication activity which in fact a great part of the responders claim they realize on at least two of the levels. Immediately a logical question arises – how do they do it.

To analyze the statement of the existence of a direct proportionality between the width of the product mix[4] (WPM) of HSU and the number of used measures for evaluating

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[4] Under width of product mix of HSU the team of the current research defines the number of accredited professional directions from the educational institution. The information for WPM in Table 3 is based on the officially published data by the National Evaluation and Accreditation Agency.

marketing communication effectiveness (MEMCE) (Table 5) a linear regression model was built by using programming language „Python".

Figure 10

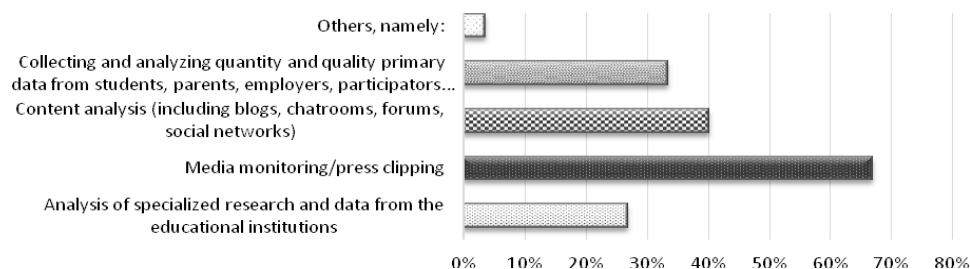Methods, means and tools for evaluating communication activity (most commonly used)

Table 5

Measures for evaluating marketing communication effectiveness and width of product mix for higher schools

Higher school	MEMCE	WPM
Technical University of Gabrovo	6	8
University of Food Technologies – Plovdiv	4	9
Medical University of Plovdiv	5	5
University of Chemical Technology and Metallurgy – Sofia	5	7
Medical University – Varna – "Prof. Dr. Paraskev Stoyanov"	3	5
University of Forestry – Sofia	6	8
University of Mining and Geology "St. Ivan Rilski" – Sofia	4	7
Agricultural University – Plovdiv	5	8
"Vasil Levski" National Military University – Veliko Tarnovo	5	7
National Sports Academy "Vassil Levski" – Sofia	5	4
Medical University – Pleven	4	5
University of Telecommunications and Post – Sofia	5	2
"G. S. Rakovski" National Defence College – Sofia	6	3
National Academy of Art – Sofia	5	1
Academy of Music, Dance and Fine Arts – Plovdiv	4	4
"Krastyo Sarafov" National Academy of Theatre and Film Arts – Sofia	6	1
Plovdiv University "Paisii Hilendarski"	5	28
University of National and World Economy – Sofia	5	6
Sofia University "St. Kliment Ohridski"	2	30
Technical University of Sofia	2	11
Trakia University – Stara Zagora	5	18
"Konstantin Preslavsky" University of Shumen	4	21
University of Economics – Varna	6	4
South-West University "Neofit Rilski" – Blagoevgrad	7	30
Technical University of Varna	4	8
"Angel Kanchev" University of Ruse	3	23

Since the quantity of data is not sufficient to find a more complex relationship between the independent and resulting variable, the simplest regression model is used – the linear model.

The coefficients **a** and **b** of the linear function **ŷ = a.(x) + b** need to be found, which can be charted as a straight line so that the sum of the squares of the distances between the points and the line is minimal.

Using the method of least squares (MLS) the regression coefficients **a** and **b** are evaluated with the formulas:

$$a = \frac{\sum Y_i X_i - N.\bar{X}.\bar{Y}}{\sum X_i^2 - N.\bar{X}^2} \qquad (1)$$

$$b = \bar{Y} - a.\bar{X} \qquad (2)$$

where:

$\bar{X} = \frac{\sum X_i}{N}$ is the average of X;

$\bar{Y} = \frac{\sum Y_i}{N}$ is the average of Y;

X_i – width of product mix for the i–th observation;

Y_i is the number of used measures for evaluating marketing communication effectiveness for the i–th observation.

From formulas (1) and (2) we obtain: **a= – 0.029** и **b = 4.947**.

From the obtained regression equation *ŷ =-0.029.(x) + 4.947*, we calculate the coefficient of determination:

$$R^2 = \frac{\sum(\hat{Y}_i - \bar{Y})^2}{\sum(Y_i - \bar{Y})^2} = 0.044$$

The obtained coefficient of determination shows that only a small part of the variation in the number of used MEMCE is caused by WPM.

In Figure 11 is given the line of the regression model *ŷ =-0.029.(x) + 4.947*. The obtained coefficient in front of the variable is negative, which is obvious from the slope of the line of the regression model. Therefore, the **sixth hypothesis** regarding the presence of a directly proportional relationship **should be rejected**.

Figure 11

Regression model between WPM and used MEMCE
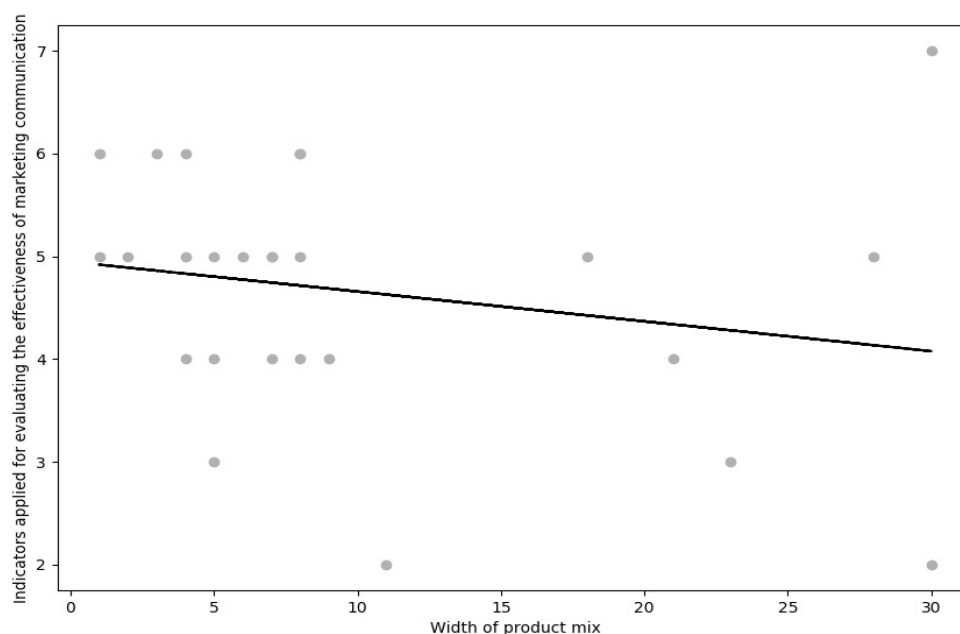
Testing the stated hypotheses in the current research demonstrates the following:

- The first hypothesis that in the conditions of intense competition among higher schools the three main competitive advantages will turn out to be "Positive brand image", "High quality of offered education", "Good reputation of HSU on the labour market" is thoroughly confirmed.

- The second hypothesis that the five types of higher schools differ in the estimated importance of inherent competitive advantages required reviewing the variable "Type of HSU" as a feature factor on five levels. For a resulting feature were used the evaluations of the separate competitive advantages. The presence of a statistically significant relation was confirmed only between "type of university" and the evaluation of competitive advantage "Marketing orientation of market". That result effectively shows that the stated second hypothesis is partially confirmed.

- The third hypothesis for the presence of planned communication strategy in HSU is partially confirmed.

- The fourth hypothesis, related to the presence of a designated communicator at the HSU, is partially confirmed.

- The fifth hypothesis that public relations are the most commonly used communication tool from higher schools is confirmed.

- The sixth hypothesis for the presence of a direct relation between the width of the product mix of the HSU and the number of measures for evaluating marketing communication effectiveness is rejected.

Thus, **the results from the conducted research partially confirm the formulated basic statement** that in Bulgarian HSU the role, position and reach of marketing communication are developed to a different degree which is determined by the capacity, width of product mix and the adopted administration practices.

3. Conclusion

Among the more important conclusions that stand out from the research are:

- The most important competitive advantages for state higher schools in Bulgaria are "High quality of the offered education", "Positive brand image", "Good reputation of HSU on the labour market". So two of the three leading competitive advantages for educational institutions have to do exactly with building positive public images. Competitive advantages having to do with specific attributes of the product itself (rich product portfolio, effective pricing policy), are left behind.

- Even though every HSU relies on marketing communication in building competitive advantages, 53,4% of them have a planned communication strategy.

- Nearly 80% of respondents share that within their educational institution there is a designated person (team) dealing with marketing communication in its complexity which shows that the necessity of a designated person/team, dealing with marketing communication, is understood.

- Almost 90% of HSU rely on "Increasing the interest in candidate students and parents" in their communication activity – an expected result which can be categorized as mostly quick. However, it should be pointed out that 73% of respondents are aware of the meaning of marketing communication for maintaining a lasting attribute of higher schools – their good reputation. Furthermore, 50% of participants in the research think that with their communication activity, higher schools could consistently and reliably change the society's perception about the necessity of higher education and its quality.

- PR has a leading role (73,3%) among communication tools used by higher schools in Bulgaria. Behind it in the frequency of application come personal sales (43,3%), advertising (33,3%), internal marketing and relationship marketing (26,7%), direct marketing (16,7%). So there is a trend to ignore the forms of direct marketing which can be exceptionally effective because it allows for a much better user targeting and even personalization through the respective communication channels.

- Own media are determined by HSU as the most important communication channel for reaching candidate students, current students and graduated students. The direct spread

of information through the organization of special events is leading in terms of communication with employers.

- Communication efforts of participants in the research are with the highest intensity in respect to their current students (86,7%) and with the lowest in respect to other higher schools (13,3%).

- Regarding the level at which communication effectiveness is being evaluated, there is a contradiction and insufficient knowledge of the ability and tools that can be used to perform such control function. 70% of the respondents declare that they follow the effectiveness from their marketing communication on every possible level – preparation, implementation and impact. To more than 2/3 of the participants in the research media monitoring (press clipping) remains the leading (and sufficient) way of getting feedback from marketing communication.

- There is no directly proportional relationship between the spread of the HSU product mix and the number of indicators for evaluating marketing communication effectiveness which means that the number of accredited directions by HSU is not a factor for performing a complete complex evaluation of marketing communication effectiveness.

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Olha Kravchenko[1]

SCENARIO ANALYSIS OF THE ASSESSMENT OF THE RAIL TRANSPORT IMPACT ON THE ECONOMIC GROWTH (ON THE EXAMPLE OF UKRAINE)

In the modern world, efficient transport infrastructure is one of the main factors ensuring economic growth in both countries and macro-regions. In this context, of particular interest are studies in states whose economies are in a state of crisis and are characterized by a high uncertainty of development parameters. To this aim, the influence of the rail transport on the economy of Ukraine was studied. The importance of Ukrainian railways in the system of international transport and communication links between the countries of Eurasia is considered. The use of scenario simulation to study the prospects for the development of the rail transport in conditions of high uncertainty has been substantiated. A SWOT analysis was performed, based on the results of which scenarios were constructed for rail transport in Ukraine. Scenario analysis showed that in the context of a systemic economic crisis, the rail transport can influence not the process of economic growth in the country, but its intensity, acting as a factor of acceleration or deceleration. Improvement of the situation is possible when developing a set of measures aimed primarily at improving the internal environment of rail transport.
JEL: C51; L92; R11

Introduction

One of the strategic directions for the development of the EU is to strengthen cooperation not only between European countries, but also within the Eurasian continent. The key element of this interaction is the transport infrastructure, which is the "circulatory system", the main purpose of which is the implementation of communication within individual states and continents as a whole due to the movement of people and goods. The significance of the contribution of the infrastructure to the economy is a recognized fact. Thus, an effective infrastructure – from transport systems, energy, telecommunications to water supply and sanitation – contributes to the development of the national economies, increasing the productivity of human and productive capital, creating new jobs and increasing population mobility. According to the estimates of the McKinsey Global Institute (2013), an annual

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saving of 1 trillion US dollars is possible by increasing infrastructure productivity by 60%, and potential savings from the rational development of infrastructure will be 15%. At the same time, an underdeveloped infrastructure can become a hindrance to the economic and social development of both individual states and regions as a whole due to an increase in growth "the penalty on ... growth" (Lind, 2009). According to estimates, in order to ensure the growth of global GDP by 2030, investments in infrastructure development should amount to 57 trillion USD and make up 4.1% of GDP (McKinsey Global Institute, 2013).

Infrastructure, including transportation, is a long-term, capital-intensive asset consisting of spatially related objects. A long duration of the life cycle of infrastructure facilities and a significant payback period of investments lead to a significant dependence of the growth rate of infrastructure and its state on the efficiency of the national economy, and the volume of investments from "market failures", that is, a situation when, due to the economic crisis, investments in infrastructure development become insufficient. According to the estimates of the European Investment Bank, the annual need for capital investments in the economic infrastructure is 688 billion euros (European Parliamentary Research Service (EPRS), 2018). At the same time, as the McKinsey Global Institute's studies show, the level of under-financing of existing infrastructure development needs in the EU countries is 16.1%, which exceeds the global average (7.3%) (Fig. 1). Thus, even now, insufficient infrastructure development is one of the braking factors for the European economies.

Such interdependence necessitates further research on the influence of the level of development and the state of infrastructure on economic growth in order to timely identify emerging negative trends in order to reduce their negative impact.

In this regard, studies are of particular interest in countries whose economies are in a state of crisis and are characterized by a high uncertainty of development parameters. To this end, the influence of the rail infrastructure on the economy of Ukraine was studied. In the study the following tasks were solved:

- Justification for the use of the scenario approach to studying the impact of the rail transport on the economy in conditions of high uncertainty;

- Constructing and analyzing future scenarios for the rail transport of Ukraine with a focus on assessing changes in its transportation capabilities;

- Assessment of the degree of influence of the rail transport on the growth of the national economy on the example of Ukraine.

The practical goal is to study the influence of the state of the rail infrastructure on economic growth in the country and the possibility of its stimulation in conditions of increased uncertainty.

The research sampling is formed from the data of industrial, economic and financial activities of JSC "Ukrainian Railways", which is the national carrier of goods and passengers and manages the rail infrastructure. The study is based on the analysis of the statistical information on the functioning of the rail transport of Ukraine for the period from 2000 to 2017.

Figure 1

Infrastructure spending, % of GDP

Source: developed by the author (data from [19])
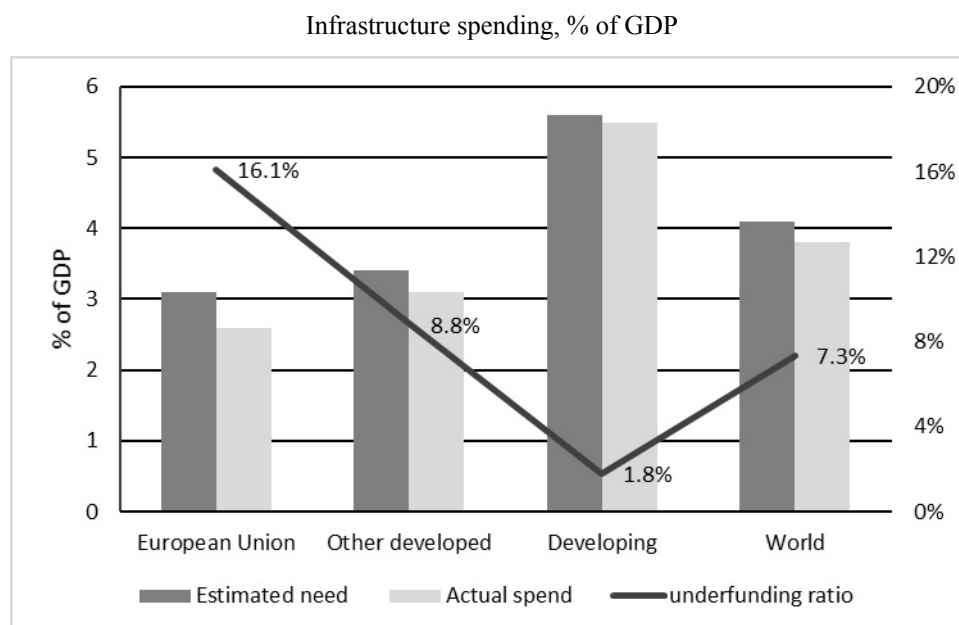
The literature review

The problem of the impact of the infrastructure development on the economic growth and economic security of states is at the centre of attention of both academic scientists and experts of the international organizations such as the United Nations, World Bank Group, Asian Development Bank Institute, McKinsey Global Institute and others. Although there is no consensus among researchers about the impact of the infrastructure on economic development, most authors note its positive impact on production efficiency, productivity and long-term growth rates.

The theoretical analysis of the impact of infrastructure on economic growth is carried out within the framework of the theory of growth. Arrow and Kurz (1970) viewed infrastructure as a component of the state capital, which was included in the aggregate production function of Ramsey-type exogenous growth models as an additional input.

Experts at the World Bank (Fay, Toman, Benitez and Csordas, 2010) point out that a modern economy cannot function without an infrastructure that provides a range of important services in determining the production economy and consumption opportunities. UN experts (2005) argue that there is a direct relationship between the quality of infrastructure and the achievement of social, economic and political goals. Inadequate infrastructure leads to lack of access to markets, jobs, information and training, and

becomes the main obstacle to doing business. At the same time, a highly developed infrastructure reduces the influence of distances between regions, ensures the integration of the national market and low-cost connection with the markets of other countries and regions. The studies conducted under the guidance of Libanova and Khvesik (2014), argue that the quality and development of infrastructure affect economic growth, reduce the disparity between income levels of the population in various ways, and contribute to the fight against poverty [7].

Stewart (2010) believes that a developed infrastructure is a major component of the success of a modern economy. He noted that infrastructure can influence production volumes (i) directly, that is, as a contribution of the infrastructure sector to the formation of GDP and as an additional contribution to the production process of other sectors of the national economy; and (ii) indirectly – by reducing operating and other costs.

Newbery (2012) focused on the relationship between investments in infrastructure development and in other sectors of the economy. He noted that insufficient investments in infrastructure restrain other investments and, thus, restrain growth, while over-investment does not have added value. Other researchers shared the same opinion (Aushauer, 1989; Calderon et al, 2011). Baldwin and Dixon (2008) note that an effective infrastructure is essential for the national security by maintaining economic growth and improving the quality of life of the population. Grundey (2008), Burinskiene and Rudzkiene (2009) also note that infrastructure development is one of the most important aspects of strategic planning, sustainable spatial and socio-economic development of the country.

In addition, on the example of the rail transport Mattoon (2004) showed that investment in infrastructure (expansion and innovative development of the rail network, which includes the railways and other infrastructure facilities necessary for transportation), in addition to the economic effect, also contributes to organizational changes. Sussman (the President Strategic Rail Finance & OnTrackAmerica, USA) emphasized the importance of railways for a well-functioning, modern society, comparing them with the availability of clean water and electricity [35]. Kravchenko O. (2013) noted that the poor condition of the rail infrastructure acts as a factor hindering the development of the national economy, by reducing the speed of movement of goods and services. In addition, "optimization" of the infrastructure by reducing it can have negative social consequences.

Palei (2015) attempted to systematize approaches to assessing the impact of infrastructure on development and identified 4 groups: (i) the contribution of infrastructure to the industrial growth, the result of an increase in production; (ii) the contribution of infrastructure to long-term economic growth; (iii) evaluating the effectiveness of the use of infrastructure and its institutional values; (iv) effect of infrastructure on income inequality (smoothing).

Modern research is reconsidering the contribution of infrastructure development to economic growth in the direction of reducing the effect (Romp and Haan, 2007 and others). However, the infrastructure is recognized as one of the 12 pillars of competitiveness (World Economic Forum, 2007) and 75% of the infrastructure that will operate in 2050 does not yet exist (United Nations, 2016). This necessitates the study of the influence of the state

and size of the infrastructure as a whole and its individual sectors on the economic growth of both macroregions and individual countries.

Research Methodology

Uncertainty always accompanies the future and exists at all times and in all circumstances (Finetti, 1974). The development of complex production and economic systems such as rail transport should be carried out purposefully and effectively to ensure the growth of the national economy.

At present, the drafting of a development strategy is "a complex scientific discipline with a multitude of subtle nuances, the attainment of which requires considerable effort" (Coyne and Subramaniam, 1996). One of the main difficulties in developing such a strategy is the understanding of uncertainty and risk as integral parts of the future. At the same time, the risks reflect the specific perception by interested economic entities of objectively existing uncertainties and conflicts, immanent processes of goal setting, management, decision-making, evaluation, which are burdened with possible threats and untapped opportunities (Vitlins′kyy, 2004).

In recent decades, the speed and intensity of change have significantly increased. The consequence of this was the formation of an opinion about the ineffectiveness of forecasting, which is unable to "resolve the issue of the domination of instability in the surrounding world..." (Keichel, 1982). A critical attitude to forecasting among some scientists continues to persist. So, Sherden (1998), dealing with the problems of forecast accuracy, notes that he does not see ways to improve economic forecasts, since this is impossible as a result of the political influence, macroeconomic changes and other factors that are reflected in the realization of forecasts. At the same time, forecasting allows reducing to a greater or lesser degree the level of environmental uncertainty by introducing certain hypotheses. Walonick (1993) notes that the prediction allows to modify the variables of the internal environment of the organization and, thereby, change ("prepare") the future, that is, the forecasts act as an invitation to make changes to the system.

The modern economy of Ukraine is characterized by sharp and poorly predictable changes in macroeconomic indicators, the dynamics of which do not correspond to the normal market cycle, but rather are inherent in crisis or post-crisis economic processes. Studies of economic processes in countries undergoing systemic transformation are always accompanied by significant problems related to the quality of time series, based on which forecasting is carried out (Skrypnychenko, 2012). In addition, in a non-stationary environment, the identified (existing) trends quickly lose their relevance: the value of prior experience decreases in inverse proportion to the rate of the structural changes.

Such economic uncertainty necessitates a departure from traditional forecasting methods based on deterministic dependencies. This is due to the fact that the future is characterized by a multiplicity of possible options, the reduction of which to the only one is not correct. Then forecasting as the basis of the development strategy of any economic system should (i) provide for the complete identification and analysis of potential quantitative and

qualitative changes in the internal and external environment of the economic system to reduce the uncertainty of the future; (ii) suggest the possibility of a quick response to the occurrence of changes by adjusting forecasts.

These requirements are met by a scenario approach (scenario planning), which is not so much an approach to predicting the future, but rather to studying and monitoring the dynamics of the state of the institutional environment and its future impacts on the functioning and development of a specific economic system. The basis of this approach consists of scenarios that are a rational method for presenting probable future options in which decisions made by the organization can be realized (Schoemaker, 1995). In this case, scenarios are not forecast in the generally accepted sense and a description of a relatively predictable future from the standpoint of past and present but are closely related to the prediction of future states. In contrast to the formal methods of planning and forecasting, scenarios are not a linear or mechanistic description of the future but reflect the exponential combination of various factors (Wack, 1985).

Even though the main research on the scenario approach falls on the 80-90 years of XX century, it retains its effectiveness in conditions of increased uncertainty, which is typical now for the economy of Ukraine. Martelli (2001) noted that the popularity of scenarios is comparable to waves that correlate with the state of uncertainty in the business environment. The use of the scenario approach will allow (i) to explore the "difficult" future, that is, in the planning process, there is the opportunity to explore existing and future uncertainties, explore and evaluate future opportunities that are potential now, and identify absolutely new ones; (ii) to develop a flexible development strategy, that is, using key success factors and realistic thinking options, to create a strategy in which circumstances and necessary flexibility of decisions will be balanced in accordance with existing and potential uncertainties; (iii) to monitor possible deviations from the planned strategy: the use of an early warning system will help to identify deviations that have occurred and, as a result, make appropriate adjustments to strategic plans in a timely manner.

The development of scenarios will be understood as an integrated scientific study of the basic laws governing the development of a specific economic system, based on the scientific methods of understanding economic phenomena and processes, and determining its states in the implementation of various scenarios. Accordingly, the scenario is a scientific model of the future of a specific economic system, built on the basis of the factors determining the patterns of development of its external and internal environment.

The basis of the scenario approach is the isolation and analysis of the main driving forces, the purpose of which is the most complete identification of both existing and emerging trends in the external and internal environment. Then the set of scenarios (S) can be described by the following expression:

$$S = \left\{ s_n : s_n = f\left(F_t, M_p, t\right) \right\},$$

(1)

where: n – number of scenarios under development; M_p – purpose of building scripts; F_t – the set of factors selected for developing scenarios are such that

$$F_t = f\big(FV(t), FZ(t), t\big);$$

(2)

where: $FV(t)$ – the set of factors that characterize the internal environment of the infrastructure in the year t; $FZ(t)$ – the set of factors that describe the parameters of its external environment.

The set of scenarios are, on the one hand, a reflection of the experts' subjective perception of the possible development of both the infrastructure network and the national economy in the future. On the other hand, when developing scenarios, factors that are not directly amenable to measurement and formalization are also analyzed and taken into account, but assuming an objective interpretation by the experts.

The analysis of the driving forces involves the allocation of 2 groups of factors, events and trends, combining which possible scenarios are developed: predetermined elements (events and trends, the development of which can no longer be stopped or changed in the analyzed (planned) period) and key uncertainties (any factors and trends in external and the internal environment, which are decisive for this economic system). Predefined elements form the unchanged frame of scenarios, but there is the problem of determining the number of key uncertainties. The experiments made by Royal Dutch Shell have shown that to cover and consider, if possible, the fullest possible range of the expected future states, provided that the number of scenarios being developed does not interfere with the quality of the analysis, two key uncertainties and the construction of 4 scenarios are sufficient (Ringland, 2002).

As already noted, it is impossible to develop correct scenarios by means of a naive prospective extrapolation of the prevailing trends and automatic use of the predicted values that characterize a possible change in the selected factors. Therefore, it is advisable to implement the following steps, involving the integrated use of quantitative and qualitative methods of analysis: (i) the formation of a set of possible outcomes of key uncertainties and predetermined elements, taking into account the influence of factors determining them; (ii) combining key variables and developing scenarios for rail transport.

The formation of a set of possible outcomes of key variables and predefined elements should be based on an analysis of the factors that determine them, and assume several (at least two or three) of their outcomes, reflecting potentially possible alternatives to their changes in the future. At the same time, the development of such outcomes should both suggest the occurrence of events, the effect of which is not known now and should not exclude obvious ones from the consideration. The process of scenarios developing can be represented as a combination of the possible outcomes of key uncertainties, followed by a description of the scenarios.

To determine the indicators related to various scenarios, adaptive forecasting methods (Holt model) were used. This allowed (i) to continuously take into account the evolution of the

dynamic characteristics of processes; (ii) to adapt to this dynamics, assigning different informational value to data related to different points in time; (iii) take into account the accumulation of quantitative process changes to identify qualitative leaps; (4) update forecasts with minimal delay.

Rail Transport of Ukraine

In the modern world, one of the requirements for transport infrastructure is to ensure the mobility of people and goods. In this context, railways as a mode of transport play an important role. Over the past decades, its value has changed dramatically. By the end of the twentieth century, it was perceived as "a social burden", rapidly losing its share in passenger and freight traffic due to the road and air transport (Andrade, 2008). One of the consequences of the global financial crisis was the change in key determinants of economic development, including in the European countries. The proclamation of the re-industrialization policy has led to a change in the understanding of the rail transport as one of the "engines" of the development of national economies, as well as industrial cooperation of various countries (Mullich, 2017).

Rail transport in Ukraine is of great importance both for the economies of the EU countries and Ukraine. The length of the Ukrainian railways is 19.8 thousand km. Three rail international Pan-European transport corridors pass through the territory of Ukraine, as well as international corridors of the Organization for Cooperation of Railways and the TRACECA international transport corridor with a total length of 3,162 km (deployed more than 6 thousand km). The infrastructure of the rail network in most indicators meets or exceeds the European requirements, except for train speed.

JSC "Ukrainian Railways" operates, manages and develops the rail infrastructure in Ukraine. The state is the owner of 100% of its shares, which are not subject to alienation. In Ukraine JSC "Ukrainian Railways" is a natural monopolist and can be identified with the rail transport. It is the main carrier of raw materials and industrial products. In 2018, freight rail transportation amounted to 56.2% of the total volume of transportation by all modes of transport (calculated on [31]).

Ukraine's rail transport is in a state of sluggish institutional changes associated with the need to separate the competitive (passenger and freight) and non-competitive (infrastructure management) sectors in accordance with EU directives. The situation is complicated by the fact that each new government has its own vision of the future rail transport. This does not contribute to "clarifying" its future, developing a rational development strategy capable of ensuring not only its effective functioning and, as a result, financial sustainability, but also the movement of transit cargo to / from Europe to Asia, as well as the economic security of Ukraine.

Ukraine in the system of the international transport and communication links objectively goes beyond the limits of the national interests due to its advantageous geographical position. It has significant transit potential, as its rail network has more than 40 international junctions and "fits in" with the railways of Russia, Belarus, the Republic of

Moldova, Poland, Romania, Slovakia, and Hungary. In Ukraine, rail transport is the only mode of transport that provides interregional and international transport and economic relations without significant competition from water and road transport (Makarenko et al., 2012). Cargo transit constitutes a significant part (up to 40%) in the structure of foreign trade cargo traffic passing through the territory of Ukraine (Sobkevych, Mykhaylychenko and Yemel′yanova, 2013). According to the international experts, the Ukrainian transport system has the highest transit ratio among the European countries – 3.11 (Stolbetsov and Tkachev, 2010). At the same time, in 2010, according to the World Bank, Ukraine ranked 102 in the ranking of transit countries (State Administration of Railway Transport of Ukraine, 2012), which indicates the underutilization of transit potential.

In recent years, the situation has only worsened: the volume of rail transit traffic has decreased significantly (Fig. 2). This was the result, first of all, of the worsening of relations with Russia, which was the main transit country for goods through the territory of Ukraine (more than 60% of transit traffic). Unfortunately, the rail network of Ukraine is not included in the ambitious One Belt One Road project ("Project of the Century"), aimed at improving cooperation between the countries of Asia, Africa and Europe and covering over 78 countries. However, Ukraine still has the opportunity to increase the transit volumes of goods and passengers, especially when implementing the predictable development strategy of the rail transport, switching to the European standards of speed, investments in rolling stock renewal and infrastructure modernization, as well as normalization of relations with major economic partners.

Figure 2

Dynamics of Transit Freight Traffic by the Rail Transport in Ukraine in 2007-2016
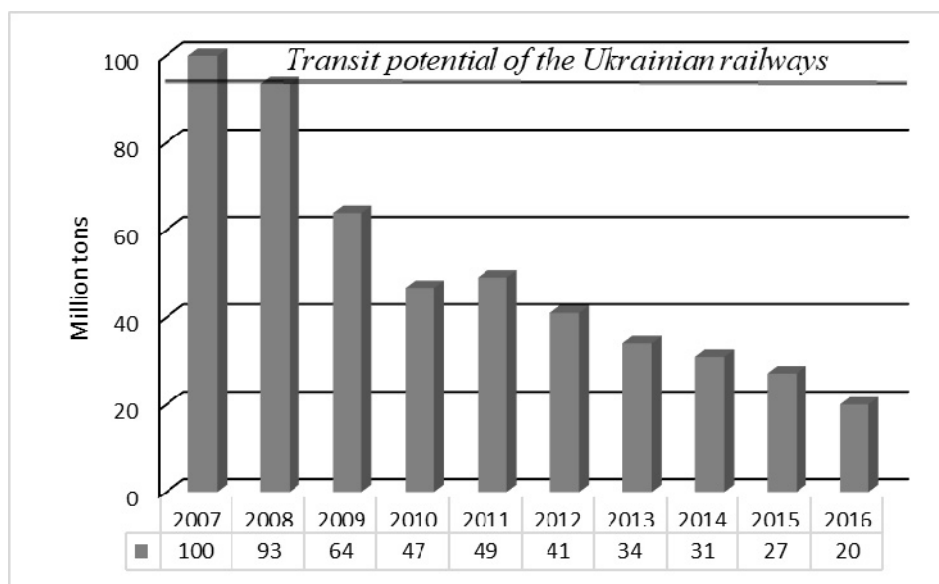
Source: developed by the author (data from [31])

The rail transport is of great importance for the economy of Ukraine. Thus, JSC "Ukrainian Railways" is one of the largest companies, which (i) provided in 2017 53.3% of the cargo turnover (calculated based on [31]) and has no competitors in freight transportation for industrial needs; (ii) is a natural monopolist and can be identified with rail transport; (iii) provided about 3% of the country's GDP; (iv) owned assets worth 10.19 billion US dollars (of which – 8.30 billion US dollars own capital); (v) was one of the largest taxpayers (in 2016 taxes in the amount of 566.19 million US dollars were paid).

In addition, it is of great importance for public stability in the state: it is (i) a key asset for ensuring population mobility – 43% of passenger traffic, including privileged categories of the population; (ii) the largest employer in Ukraine – 272 thousand workers or 1.5% of all employed in the national economy (State Statistics Service of Ukraine, 2018).

Thus, the rail transport of Ukraine has a great influence on the economy of Ukraine and the European countries. Therefore, the study of its impact (first of all, changes in carrying capacity and transportation capacity) on the economy of the country and the region as a whole seems necessary.

Modelling Scenarios for the Development of the Rail Transport of Ukraine

Model Representation of the Subject Area of Scenarios

Scenarios suggest the selection and description of the subject area, that is, parts of the real world, which will be affected by the level of development of the rail transport. One of the infrastructure features is a high level of capitalization, rather high labour and material costs for its creation. The consequence of this is the significant influence of the prehistory of development and the relationship between the national economy and the specific (rail) infrastructure sector–on its size and physical condition. Then the domain model can be described through the following parameters:

$$SC(t) = \langle V(t-2), E(t), C(t-1), \psi, \upsilon, \eta, t \rangle, \tag{3}$$

where: $V(t-2) = \{v_i(t-2)\}$ – the set of input domain parameters formed by the internal and external environment of the infrastructure sector; $E(t) = \{e_j(t)\}$ – the set of output parameters of the subject area (indicators of production, economic and financial activities of the infrastructure sector, as well as parameters of the national economy); $C(t-1) = \{c_j(t-1)\}$ – the set of possible states of the domain in the future (many developed scenarios); ψ – the family of reactions of the subject area to the input parameters; υ – the family of the state transition functions; η – the family of functions that characterize the reaction of one element of the subject area depending on the change of another element, that is, changes in the infrastructure sector as a reaction to the state of the environment and vice versa; t – period of time.

The set of input parameters of the subject area $V(t-2)$ should be formed on the basis of the developed strategy for the development of the infrastructure sector, control and analytical data on its operation in previous periods of time, information on current investment needs, restrictions and conditions imposed by the institutional environment, etc.

The domain must implement the mapping of the set $V(t-2)$ into the set $E(t)$ through the development of the set of scenarios $C(t-1)$, the development of which can be represented as a functional of the following type:

$$C(t-1) = f(V(t-2), S_z(t-1), Y_z(t-1), Y_e(t-1), t), \qquad (4)$$

where: $S_z(t-1)$ – operating parameters of the rail transport, reflecting the characteristics of the circulation of resources in the system (the composition and structure of assets $\Rightarrow$ the generation of incoming and outgoing cash flows $\Rightarrow$ financial results $\Rightarrow$ volumes and directions of investment activity); $Y_z(t-1)$ – the set of existing trends in production, economic and financial aspects of the functioning of the rail transport; $Y_e(t-1)$ – the set of identified trends in environmental parameters, which are key factors for the development of the infrastructure sector.

As the infrastructure develops evolutionarily, the subject area should be considered as a dynamic system, $SC(t) \subset V(t-2) \times E(t)$, for which there are three families of mappings:

1) family of reactions of the subject area to the incoming parameters, which can be represented as follows:

$$\psi = f(V(t-2), C(t-1), t) = [\psi(t) : V(t-2) \times C(t-1) \rightarrow E(t)]; \qquad (5)$$

2) family of transition functions of the system states, which can be represented as follows:

$$\upsilon = f(C(t), V(t+1), t) = [\upsilon(t, t+1) : C(t) \times V(t+1) \rightarrow C'(t+1)], \qquad (6)$$

where: $C'(t+1)$ – revised scenario;

3) family of functions that characterize the reaction of one element of the domain depending on the change of its other element:

$$\eta = f(\psi(t), \upsilon(t+1), t) = [\eta(t, t+1) = \psi(t) \times \upsilon(t+1) \rightarrow \psi(t+1)]. \qquad (7)$$

The mapping families ψ, υ and η completely describe the trends and interactions that exist both within the infrastructure sector and with the external environment, which will find its reflection in the developed scenarios.

Highlighting the driving forces of the rail transport development as a base for future scenarios

To highlight the predefined elements and key uncertainties, a SWOT analysis of the Ukrainian rail transport was carried out (Table 1). It showed that the strengths and weaknesses, as well as opportunities and risks of development, are derived from (i) its technological features and development history; (ii) the state is the most influential and interested stakeholder with active leverage in the operation of the rail transport, both through direct influence on tariff policy and indirectly, as a result of political decisions taken. This determines the need to single out one predetermined element in the internal environment of the infrastructure sector, and the second – in the external environment.

It should be borne in mind that

1) improving the competitiveness of the rail transport is possible only as a result of a gradual and consistent change in the state of infrastructure and rolling stock, as well as the introduction of the modern transport technologies;

2) demand for the rail transportation is associated both with its technological features and the volume of manufactured industrial products;

3) a sharp increase in the transportation capacity of the rail transport cannot occur as a result of both the lack of the necessary financial, material and labour resources, and the impossibility of stopping or significantly reducing the transportation process for the period of reconstruction;

4) investments in infrastructure development and rolling stock renewal will be formed only at the expense of the depreciation fund and the net profit received by JSC "Ukrainian Railways". The possibility of obtaining funds from the budget or from private investors can be neglected due to both the low probability of their receipt and the insignificance of volumes;

5) freight transportation, as a transportation market segment, will be a key area of investment activity; and

6) features of rail transport are the high interconnection between the technological parameters of its infrastructure and the rolling stock (mobile railway units intended for the transportation of goods and passengers by railways).

Then the actual size of the rail infrastructure will be the predetermined element, the key uncertainty 1 is the demand for rail transportation (transit, freight and passenger), the key uncertainty 2 is the reform of the rail transport.

Table 1

SWOT analysis of the Ukrainian rail transport

Strength	*Weakness*
High density of railways and a single technological process	Hard binding to the rail network
Possibility of year-round transportation	High infrastructure maintenance costs
Possibility of mass transport over long and medium distances	Need for large investments in infrastructure and rolling stock
Stable demand for freight and passenger traffic	High moral and physical deterioration of capital assets
Stable nomenclature of freight traffic	Weak use of the transit potential of Ukraine
High environmental friendliness and safe transportation	Cross-subsidization of passenger traffic
High reliability and durability of rolling stock	Low management efficiency of the rail transport
Opportunities	*Threats*
High transit potential due to favourable geographical position	Imbalance of supply and demand in the rail transport
Increased need for transit	Reducing the competitiveness of passenger and freight traffic
Growing demand for intermodal and multimodal transportation	Strict government regulation of the rail transport
Transport market unsaturation	State intervention in operations

Source: developed by the author based on [14, 15].

In this study, two potential outcomes (optimistic and pessimistic) were developed for each identified key uncertainty for obtaining four scenarios for rail transport. At the same time, the pessimistic option will be understood as the persistence of existing negative trends in the internal and external environment of the rail transport, and the optimistic one is the appearance of their most desirable states and trends. Consider the possible implementation of the selected driving forces for the development of the rail transport in Ukraine with an assessment of possible consequences.

The predetermined element is the size of the rail infrastructure. Now there is a process of rapid deterioration in the quality of the rail infrastructure: according to the World Economic Forum in 2016, the rail infrastructure of Ukraine was in 34 positions from 139 countries (compared to 27 in 2012) [40]. This was the result of the insufficient intensity of the introduction of new infrastructure instead of morally and physically obsolete due to lack of funding. Thus, according to the data of JSC "Ukrainian Railways", since 1992, the need for investment was satisfied only by 25–30% [30]. Thus, (i) the size of the rail infrastructure is enough to provide domestic and transit traffic and there is no need to increase it; (ii) infrastructure capacity can be increased by updating and modernization of its facilities.

The size of the rail infrastructure will be reduced, since it is redundant and designed for significantly larger volumes of domestic and transit traffic. There are two options for optimizing the size of the rail infrastructure in Ukraine.

Alternative 1 – implementation of the existing rail transport reform program, considering the Agreement on the EU Association and Ukraine, which involves the separation of transportation processes from infrastructure management. This option should be considered pessimistic, since the process of reforming the rail transport of Ukraine is not carried out systematically. The consequence will be a rapid decrease in rail infrastructure and a violation of its integrity.

Alternative 2 – the evolutionary development of rail transport, considering possible directions for optimizing the use of rail infrastructure. This alternative can be considered as optimistic. Its implementation provides for the evolutionary development of the industry and the gradual decommissioning of underutilized sections of the rail network.

Table 2 shows the forecast for financing rail infrastructure, calculated for optimistic and pessimistic alternatives. In table 2 and further in the text, 2017 is the base year, 2018-2019 are transitional (pre-scenario) years, 2020-2024 are the years for calculating the scenarios.

Table 2

Forecast estimates of rail infrastructure financing needs in Ukraine

Indicators	Years							
	2017	2018	2019	2020	2021	2022	2023	2024
	Pessimistic alternative							
Operational length of railways, thousand km	21,7	20,3	18,7	17,2	15,7	14,3	12,8	11,27
Maintenance of the rail network, billion $	0,69	0,65	0,59	0,54	0,49	0,45	0,40	0,35
	Optimistic alternative							
Operational length of railways, thousand km	21,7	21,4	20,8	20,3	19,9	19,4	19,0	18,5
Maintenance of the rail network, billion $	0,69	0,66	0,65	0,64	0,62	0,61	0,59	0,58

Source: calculated by the author based on [30, 31, 33,]

Key uncertainty 1 – demand for the rail traffic (formed by the external environment). The main services provided by rail are freight and passenger traffic, the volumes and profitability of which are determined by the factors of different nature and degree of influence. Domestic freight transportation in Ukraine has a stable range, which determines the high dependence of the number of transported goods on the production volumes of the mining, chemical and metallurgical industries. Transit freight traffic is a more competitive transport sector and depends not only on transportation needs, but also political decisions taken (incorrect statements and irrational actions of officials of the Ministry of Infrastructure led to the redirection of transit cargo and passenger traffic bypassing the territory of Ukraine). Passenger traffic in the suburban and long-distance communications are stable.

Alternative 1 – pessimistic – preserving current trends, that is, reducing traffic due to the crisis in the Ukrainian economy, political decisions and ineffective policies. The result of the implementation of this alternative will be a reduction in the revenue base of JSC

"Ukrainian Railways", an attempt to make it larger by increasing tariffs, which, in a crisis, will lead to a slowdown in economic development in Ukraine. The implementation of this alternative is very dangerous, since the maintenance and the development of rail infrastructure in Ukraine are carried out for the income received from freight transportation.

Alternative 2 – optimistic – the development and implementation of evidence-based economic policies aimed at the growth of the national economy. The result of the implementation of this strategy will be an increase in the production volumes of the main industries and, as a result, rail transportation, as well as the income of JSC "Ukrainian Railways" and its ability to finance the modernization of the rail infrastructure, which will increase the attractiveness of transit through the territory of Ukraine.

Table 3 shows the forecasts of demand for various types of transportation and the expected income from their implementation.

Table 3

Forecast estimates of demand for rail transportation of various types

Indicators	Years							
	2017	2018	2019	2020	2021	2022	2023	2024
Pessimistic alternative								
Potential demand for freight transportation, million tons	407,4	398,5	389,7	393,2	396,8	400,3	403,9	407,6
including transit	40,9	38,9	36,9	35,1	33,3	31,6	30,1	28,6
The possibility of satisfaction, %	100,0	100,0	100,0	100,0	98,0	95,2	91,8	87,5
Profit, billion $	2,06	1,87	1,51	1,21	1,13	1,06	1,01	1,03
Potential demand for passenger transportation, million	519,4	512,2	505,0	497,7	490,5	483,2	476,0	468,8
The possibility of satisfaction, %	100,0	100,0	90,7	83,4	82,2	81,1	75,1	68,9
Profit, billion $	-0,80	-0,82	-0,85	-0,88	-0,90	-0,93	-0,95	-0,97
Total profits, billion $	1,26	1,05	0,66	0,33	0,23	0,13	0,06	0,06
Optimistic alternative								
Potential demand for freight transportation, million tons	407,4	398,5	389,7	393,2	396,8	400,3	403,9	407,6
including transit	40,9	40,9	40,9	40,9	40,9	40,9	40,9	40,9
The possibility of satisfaction, %	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Profit, billion $	2,06	2,03	2,00	2,03	2,04	2,06	2,08	2,11
Potential demand for passenger transportation, million	519,4	491,8	478,0	464,5	451,2	438,2	425,5	413,1
The possibility of satisfaction, %	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Profit, billion $	-0,80	-0,64	-040	-0,24	-0,15	-0,04	0,09	0,25
Total profits, billion $	1,26	1,39	-38	1,79	1,89	2,02	2,17	2,36

Source: calculated by the author based on [30, 31, 33].

Key uncertainty 2 – reforming the rail transport (formed by the internal environment). The need to reform the rail transport in Ukraine is not in doubt either among the transport industry researchers or the practitioners. The situation with the reform of the rail transport in Ukraine is already compared with the treatment of a patient who was diagnosed a long

time ago and was prescribed an operation, but his doctors are constantly changing and each new one offers to do the surgery in a different way. Doctors do not start decisive actions, therapeutic treatment does not help, and the patient continues to suffer and limp (Sychov, 2013).

The main results of reforming the rail transport in Ukraine should be: (1) the delimitation of the economic and public administration functions; (2) the formation of vertically integrated structures by type of activity; (3) increased competition; (4) the formation of a competitive potential in the external market of transport services; (5) ensuring equal access of all entities to infrastructure facilities; (6) improvement of the tariff regulation system for rail transport services; and (7) development and implementation of innovative transport and logistics technologies.

Alternative 1 – the implementation of the provisions of the Association Agreement between Ukraine and the EU (2014) in the field of the rail transport. This alternative, for all its attractiveness, should be regarded as pessimistic. This can be explained by the fact that the provisions of the Agreement do not consider the technological features of the rail infrastructure of Ukraine, its size, the possibility of reformatting during the specified periods (5-8 years) and the amount of necessary investments. The result of the implementation of this alternative will be a violation of the integrity of the rail network, which could have disastrous consequences for the economy of Ukraine.

Alternative 2 – the optimistic – the evolutionary development of the rail transport of Ukraine within the framework of "1520 area", which includes the countries of the Customs Union, the Baltic States, and Finland. Implementing this alternative with sufficient investment will allow preserving the value of Ukraine's rail network as a link between Europe and Asia, not ending up in a technological vacuum, preserving the value of the main element of the transport infrastructure of Ukraine, and also avoiding unproductive capital investments.

Table 4 shows the projected costs for the implementation of the reform program of the rail transport of Ukraine considering the expected costs of updating the infrastructure and rolling stock.

Development and analysis of scenarios for the rail transport of Ukraine

Possible scenarios were determined based on the scheme representing a plane, the axes of which will be determined by key uncertainties (reforming JSC "Ukrainian Railways" and the demand for rail transportation), and the poles by two most important and possible outcomes (Fig. 3). Reflecting the predefined element on the diagram is not necessary, as they will form a constant basis for all the developed scenarios.

In accordance with the proposed scheme, four possible scenarios were developed for Ukraine's rail transport: pessimistic, current, negative and optimistic. The results of the implementation of these scenarios are presented in Table 5.
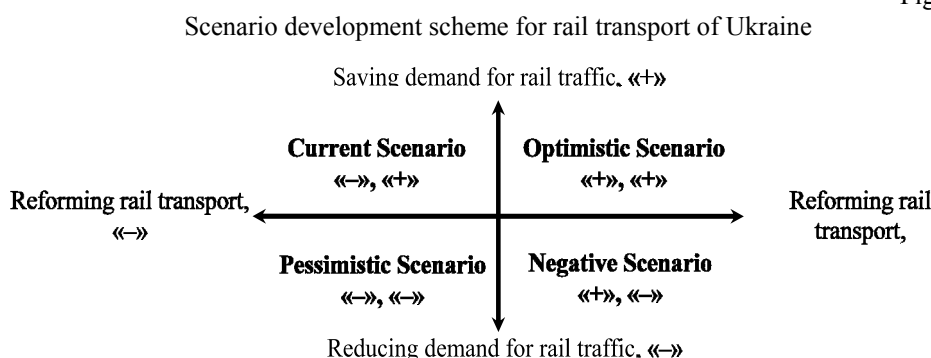
Table 4

Forecast estimates of costs for the implementation of the reform program of the rail transport of Ukraine, billion $

Indicators	Years							
	2017	2018	2019	2020	2021	2022	2023	2024
	Pessimistic alternative							
Infrastructure upgrade costs	4,35	4,32	4,27	4,22	4,17	3,75	3,71	3,66
Rolling stock upgrades costs	4,40	4,40	4,40	4,40	4,40	4,40	4,40	4,40
Costs associated with the implementation of the reform program	0,02	0,02	0,02	0,02	0,01	0,01	0,01	0,01
Total cost	8,77	8,74	8,69	8,64	8,58	8,16	8,12	8,07
	Optimistic alternative							
Infrastructure upgrade costs	4,35	3,50	1,71	1,70	1,69	1,67	1,66	1,64
Rolling stock upgrades costs	2,80	2,80	2,80	2,80	2,80	2,80	2,80	2,80
Costs associated with the implementation of the reform program	0,02	0,02	0,02	0,02	0,01	0,01	0,01	0,01
Total cost	8,77	6,32	4,53	4,52	4,50	4,48	4,47	4,45

Source: calculated by the author based on [30, 31, 33,]

Figure 3

Scenario development scheme for rail transport of Ukraine

Source: developed by the author

The results of the implementation of these scenarios are presented in Table 6. As can be seen from the calculations, the cumulative financial result from operating activities for the three scenarios (pessimistic, current and negative) during the forecast period will decrease, and for the pessimistic (since 2022) and negative (since 2023) it will become negative, which means the actual termination of the functioning of the rail transport of Ukraine. This will be the result of not only a reduction in the demand for transportation, primarily freight, but also a shortage of non-current assets in the form of rolling stock (locomotives, semi-cars, passenger cars, etc.).

Table 5

The results of the implementation of scenarios for rail transport in Ukraine

Pessimistic scenario
1. Progressive deterioration of fixed assets.
2. A sharp decline in transportation revenues and, as a result, the growing deficit of its own current assets.
3. The need to attract additional financial resources to finance operating activities.
4. The excessively high cost of attracting investment resources.
Result: reduced capacity and transport capacity as a result of the integrity of the rail network.
Current scenario
1. Continuing the trend of increasing physical and moral depreciation of fixed assets.
2. Covering the deficit in financing operating activities at the expense of short-term bank loans.
3. Lack of rolling stock (locomotives and wagons) for freight and passenger traffic.
4. The high cost of attracting financial resources to finance investment needs.
Result: reduced transportation capacity due to a shortage of rolling stock and deteriorating infrastructure.
Negative scenario
1. Reduced revenue due to lower demand for transportation.
2. The growing shortage of own current assets.
3. Lack of long-term borrowed funds due to the low investment attractiveness of the rail transport.
4. The impossibility of timely financing the program of reforming the rail transport.
Result: reduced transportation capacity of the rail transport due.
Optimistic scenario
1. The difficulties of financing the modernization of the rail infrastructure due to lack of financial resources and lack of government support.
2. Maintaining a shortage of rolling stock and, as a result, a decrease in the share of the freight and passenger traffic market.
3. The lack of long-term borrowed funds to ensure the development of the rail transport due to its low investment attractiveness.
4. Minor improvement of infrastructure and rolling stock due to investments in maintaining them in working condition.
Result: restoration of transportation capacity and carrying capacity as a result of investments in infrastructure and rolling stock.

Source: developed by the author.

As a result, the shortage of current assets is growing, which negatively affects the investment opportunities of JSC "Ukrainian Railways" and provokes a further deterioration in the condition of fixed assets involved in the provision and implementation of transportation activities. At the same time, the need for external crediting of the rail transport is increasing to meet the need for financing operating activities and capital investments. This will be accompanied by an increase in the cost of attracted financial resources (now the cost of long-term and short-term rail transport loans exceeds the market average, which does not contribute to the modernization of its infrastructure. The implementation of these scenarios will reduce the level of satisfaction of demand for rail transportation: for the pessimistic scenario since 2021, current – since 2022, and negative – since 2020, despite the fact that the implementation of scenarios 1 and 3 already implies a decrease in demand for rail transport due to reduced industrial production.

Table 6

Forecast for the designed scenarios of the future rail transport of Ukraine, billion $

Indicators	Years					Years				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
	Pessimistic scenario					*Current scenario*				
Deficit of own current assets	2,7	3, 6	4,3	4,6	4,6	—	—	1,0	1,6	1,9
Total profits, billion $	0,33	0,23	0,13	0,06	0,06	1,79	1,89	2,02	2,17	2,36
Maintenance of the rail network, billion $	0,54	0,49	0,45	0,4	0,35	0,64	0,62	0,61	0,59	0,58
Infrastructure upgrade costs	4,22	4,17	3,75	3,71	3,66	4,22	4,17	3,75	3,71	3,66
Rolling stock upgrades costs	4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4	4,4
Deficit of own resources	-8,83	-8,83	-8,47	-8,45	-8,35	-7,47	-7,3	-6,74	-6,53	-6,28
Satisfaction of demand for transportation, %	100,3	94,3	94,9	95,7	90,5	100,0	100,0	98,0	95,2	91,8
	Negative scenario					*Optimistic scenario*				
Deficit of own current assets	2,8	3,7	4,6	5,4	5,8	—	—	—	—	—
Total profits, billion $	0,33	0,23	0,13	0,06	0,06	1,79	1,89	2,02	2,17	2,36
Maintenance of the rail network, billion $	0,54	0,49	0,45	0,4	0,35	0,64	0,62	0,61	0,59	0,58
Infrastructure upgrade costs	1,7	1,69	1,67	1,66	1,64	1,7	1,69	1,67	1,66	1,64
Rolling stock upgrades costs	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8
Deficit of own resources	-4,71	-4,75	-4,79	-4,8	-4,73	-3,35	-3,22	-3,06	-2,88	-2,66
Satisfaction of demand for transportation, %	94,4	84,3	80,6	77,2	68,9	100,0	100,0	100,0	100,0	100,0

Source: calculated by the author

If the optimistic scenario is implemented, there will not be a shortage of own working capital to finance operating activities. At the same time, JSC "Ukrainian Railways" will not have enough own funds to maintain and develop the infrastructure. It necessitates the attraction of significant financial resources from the external sources. A positive moment in this scenario is that the demand for transportation will be fully satisfied. This scenario is conditionally optimistic, since there will be enough own resources to maintain the infrastructure in working condition, but not to develop it.

Conclusions

The analysis of the constructed scenarios showed that in crisis conditions the rail transport would not become a factor stimulating the growth of the national economy of Ukraine ("the locomotive of the economy"). This is primarily due to the development of crisis phenomena in the JSC "Ukrainian Railways". And even in the situation of increasing demand for rail transportation due to the growth of industrial production, it will, on the contrary, be a deterrent due to the "loss" of transportation capacity and carrying capacity due to a decrease in the number of cars and locomotives, as well as the integrity of the network.

Thus, the rail transport can influence not the process of economic growth in a country, but its intensity, acting as a factor of acceleration or deceleration.

To improve the situation, it is necessary to develop a set of measures aimed primarily at the internal environment. In the case of Ukraine, such a complex should involve the development of a scientifically based strategy for reforming the rail transport, based on rational egoism. This will allow for its effective modernization, considering the priorities of the development of the national economy and without at the same time entering into direct conflicts with the main partners, primarily the EU countries and the Russian Federation. In addition, in order to avoid problems with the financing of transportation activities, it is necessary to introduce stringent requirements for the order of financial activities, namely (i) the priority of financing operating activities; (ii) the high priority of investments in the renewal of rail facilities and rolling stock; (iii) prioritizing the use of credit resources for the implementation of operating and investment activities; (iv) the focus of financial planning on maintaining the financial stability of a monopolist – JSC "Ukrainian Railways".

The further studies of the impact of infrastructure on the economic growth should be directed to (1) the development of a set of measures to strengthen its stimulating effect, taking into account the institutional characteristics of a particular country (region); (2) study of the impact of the level of innovation of individual infrastructure sectors on the economic growth; (3) consideration of the problems of increasing the interoperability of the rail networks on the Eurasian continent.

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DEMYSTIFYING THE FACTORS CONTRIBUTING TO SUCCESSFUL PROCESS INNOVATIONS IN THE CZECH AUTOMOTIVE INDUSTRIES

There is a need for firms to know the factors driving their process innovation. Knowledge of these determinants will help firms to withstand the tough market competitions from their rivals leading to growth and increased productivity. The purpose of this paper is to examine the determinants probable to influence firms process innovations. We focused on the automobile industries in the Czech Republic using data from the Eurostat Community Innovations Survey (CIS) conducted between 2012-2014 and the Structural Equation Model. Our results have shown that the main driving factors probable to contribute to process innovation in these industries were innovation expenditures, collaborations with different partners, engaging in research and development and innovation financial support. Contrary to the literature, we found out that firm's competition in international markets didn't have any influence on their process innovations. Practical implications are also provided for policymakers and management of these industries.
JEL: L62; 030; 031

Introduction

Endogenous theories of economic growth rose to prominence based on its focus on the role played by knowledge in countries economic growth process (Romer, 1990). Other traditional growth theories ignored the vital role of knowledge in the growth process (see Solow, 1956). Solow and Swan suggested that the level of technological development was influenced by external scientific processes which are independent and not influenced by economic forces. But according to proponents of new growth theories knowledge is not an accidental occurrence, it takes conscientious means and both public and private resources to produce. Economic agents heavily invest resources in Research and Development (R&D) for innovations.

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Innovation is highly expected to stimulate wealth, economic growth (national and regional) and competitiveness in firms and countries (OECD, 1997). OECD identifies four types of innovations within firms, namely product, process, organizational and marketing innovations (OECD, 1997). In this paper, we focus on process innovations which is defined as is the swiftness with which firms can implement new or significantly improved methods of production or delivery (Klewitz and Hansen, 2014). These improved methods can occur if firms alter their production techniques, upgrade their equipment and software. Firms cannot be innovative in isolation (Odei and Stejskal, 2018), they, therefore, need some partners who can help in their innovations pursuits. Firms can derive their innovations from diverse sources. The first sources of these innovations can be from the firm's internal sources, where firms can carry out research and development related activities by boosting their manpower base and learning from experiences (Blind et al., 2017). They can also employ skilled labour who are more knowledgeable and can apply knowledge and transform it into economic outputs. When firms realize there is low absorptive capacity in their employees, they can resort to organizing regular intramural education and training activities to expand and improve their internal knowledge capacity. All these measures can go on to affect firms process innovations i.e. productions and delivery methods.

When these internal measures are not enough to trigger innovations, firms can resort to open innovations strategies (Chesbrough, 2006). They can do this by engaging in synergies with partners such as clients and customers, knowledge institutions (universities and public research organizations), and with other firms and competitors. Higher educational institutions and other public research institutions are the birthplaces of scientific and technological knowledge firms need to increase their innovations and competitiveness. Universities can be the dependable resources that industrial innovation policies can rely on. University research output is an important source of significant technological innovation which can give firms a competitive market advantage (Calantone and Stanko, 2007). Beside educational sources, market partners such as suppliers of machinery and equipment can also influence the firm's process innovations. Suppliers of equipment and machinery can offer a significant understanding of firms' production, distribution and logistics activities. They can teach firms about new technologies and through their initiatives, firms can learn and become conversant with these modern and improved technologies.

Certain spontaneous decisions taken by firms also escalate their process innovations. One of such decisions is the extent of internationalization or firms' competitions in international markets by exporting their goods and service. Firms decisions to export can be a strong incentive for them to be innovative (Ramadani et al., 2017). Exporting exposes firms to competitions from other foreign firms and customers. So, their product quality, branding and design need to conform to or be more than that prevailing in the international market (Coccia, 2017). When this is not the case, international market competitions can be a learning platform for these firms. International market competitions can increase firms' capabilities to implement new techniques of production when the local innovation ecosystem is weakly developed. Competing in foreign markets prepare the grounds for firms process innovations, this is because it allows firms to learn and stay ahead of their rivals.

The success of these innovations (process) within firms also rests on the financial support they receive from governments. Shortage of capital poses as a great challenge for firms that want to be innovative. But governments across the globe have come to the rescue of firms that lack the necessary capital for innovation and its related activities. Governments are increasingly getting involved in the innovation process because of the market failures syndrome. Market failure is the key rationale for governmental innovation interventions (Guan and Yam, 2015). Some policy tools mostly employed by governments to boost firm-level innovations include research and development (R&D) tax credits, which is targeted at helping firms to narrow the financial gap that acts as major hindrance to innovation (Hölzl and Janger, 2014).

The Czech automotive industry is the focus of this paper. This sector is the foundation on which the Czech economy is built. This sector plays a key role in the European as well as the global economies (Winter, 2017) The Czech automotive sector alone employs about 150,000 people, making it the main gross value employer in Central Eastern Europe (Pavlínek, 2018). Owing to the enormous contribution this sector brings to the Czech Republic, this paper aims to examine the factors driving and sustain its process innovations. This will share more light on the factors driving the success of this sector. It will at the same time serve as a guide to management and policymakers as it will enable them to know where to channel their scarce investment resource.

The remaining sections of this paper are structured in the following order: Section 2 is devoted to the theoretical background providing reviews of the literature on process innovations. Section 3 focuses on the data and methods used for our empirical analysis, Section 4 provides the results of empirical analysis and discussions. Section 5 concludes the paper and draws attention to some policy implications and suggestions for future research.

Determinants of firms' innovation performance

The OECD Oslo Manual uses the term innovation to denote "scientific, technological, organizational, financial and commercial activities which lead or intended to lead to the implementation of technologically new or improved products or services" (OECD-Eurostat, 1997). The sources of these scientific and technological inventions have been traced to the firms confines, the business environment, universities and other higher educational as well as government research centres. Firms can rely on universities scientific research to reap high turnover and offer improved goods and services to the market. The propensity of firms to introduce newly improved products into the market depends on the whole lots of factors. Hagedoorn and Cloodt (2003) have suggested that, to determine these innovative performances, researchers need to rely on multiple indicators because these innovations do not arise from single sources but rather through various combinations of sources and efforts.

The most essential determinant of firms' innovation performance and their ability to introduce significantly improved products is contingent on the expenditure they devote to finance innovation. With readily available funds, firms can undertake novel research in collaboration with important partners such as universities and public research

organizations. These new ideas from knowledge institutions can transform industries ultimate economic interests of making huge profits. Firms' innovation expenditure is an input that can be utilized to appraise their process innovation performance (Klomp and Van Leeuwen, 2001). Firms' expenditures on R&D can have a critical and direct impact on their innovation activities and their propensity to soak up external knowledge, when firms have enough and reliable sources of funding, it can increase their gross earnings and competitiveness (Frenz and Ietto-Gillies, 2009). R&D funding can balloon companies' total productivity and reduce their production cost (process innovation) and increase the quality of their products.

Governments provide funding and subsidies to stimulate innovation activities of industries. The rationale behind government supporting firms R&D with subsidies is because of the positive spillover effects and social returns to the economy (Arrow, 1962). Excessive spending by national governments can also result in innovation paradox, due to the fact that most of these firms have a lower absorptive capacity to use earmarked funding aimed at promoting innovation. Government funding does not always contribute to improved innovative performance, Chesbrough (2006) has argued that innovative firms do not spend hugely on R& D; instead they can rely on knowledge and expertise from diverse external sources to enhance their innovation performance. From the above mentioned, we provide the hypotheses that,

H₁: The availability of funding support does not improve firm's process innovations.

As stated above, decisions made by firms affect their innovations potentials, an important of such decisions is to collaborate with other partners. Firms cannot innovate in isolation, so they need to look beyond their internal confines. They can also derive their innovations externally by forming synergies with another partner, such as science system (universities and public research organizations), clients, customers and suppliers and other market competitors (Maietta, 2015). These external innovation collaborations help firms to overcome their innovation barriers and allow them access to knowledge which is seen as a kernel in the innovation process (West and Bogers, 2014). Firms innovations collaboration with other partners increases the likelihood of accomplishing process innovation (Un and Asakawa, 2015). Universities especially can primarily be relied upon for achieving process innovations and conducting basic research into technologies. Universities are a significant source for the firm's product innovation especially in emerging technology. Numerous empirical studies have proven that when firms engage in R&D collaboration their process innovation performance soars (see Lööf and Heshmati, 2002; Criscuolo and Haskel, 2003). Therefore, forecast that,

H₂: Firms collaborations with other partners significantly improve their process innovation.

In addition, the strengths and prospects of the firm's process innovation performance can be influenced by R&D expenditure. Firms need to invest a lot to be able to produce goods and services (Klette and Kortum, 2004). The expenditures firms spend on R&D could yield

innovations relevant to any goods and processes with equal probability. Using econometric analysis Chudnovsky et al. (2006) have demonstrated that in house technology acquisition and R&D expenditures have a positive impact on firm's probability to offer new products and processes to the market. Crépon et al. (1998) also proved that when firms increase their R&D intensity by 10% it can trigger a corresponding 5% increase in their innovation sales. Similarly, a study by Baldwin and Lin (2002) conducted in the manufacturing firms in Canada concluded that the probability of firms to introduce a new process increased by 15% within firms that engaged in R&D spending and activities. Based on the above-mentioned arguments, we provide our third hypothesis as,

H_3: Expenditures devoted to research and development contribute to firms' overall process innovations.

Firms that make the decision to compete in international markets by exporting their products can be more innovative than those with just domestic market orientations (Belderbos et al., 2015). Domestic firms compete in foreign markets when they export their products, this exposes them to tougher competition usually from subsidized and quality foreign products, this compels and incentivize local producers to innovate. Additionally, when exporting firms participate in foreign markets it expediates their acquisitions of extraneous technologies. Market competitions compel firms to innovate to be the market leader by winning large shares of the market ahead of their competitors (Berry and Berry, 2018). According to Bratti and Felice (2012) exporting firms are more likely to undertake R&D which can affect their ability to introduce new processes than their counterparts with domestic market focus. This is because exporting to new markets can improve firms' knowledge of foreign production processes and increase their aptness to assimilate new technologies (Johanson and Mattsson, 2015). Studies conducted by Damijan et al. (2010) for large and medium-sized firms in Slovenia concluded that exporting swells the likelihood of becoming process innovators. Based on the literature, we provide the fourth hypothesis as follows,

H_4: Firms that export their products are likely to be process innovators.

Engaging in research and development (R&D) activities is crucial for firm's growth and success (Baumann and Kritikos, 2016). R&D equip firms with the requisite knowledge-based resources and increase their absorptive capacities. Investments in R&D contribute to ameliorating firms' absorptive capacity and makes them able to acknowledge the value of new knowledge and information and been able to assimilate and commercialize (Odei, 2017). R&D investments enhance the learning capabilities of firms and improve their aptitude to use advanced technologies (Maietta, 2015). When firms make the decision to conduct R&D, it influences their prospect of introducing new products and processes (Raymond and St-Pierre, 2010). Here the hypothesis we propose is that,

H₅: Conducting R&D is likely to positively influence firms process innovations

This paper intends to contribute to the growing literature on firm-level innovations. Understanding the factors contributing to process innovations would be of immense help to these industries because it would allow them to come out with innovative ways of improving their production and distribution methods, leading to customer satisfaction and firm growth. In a nutshell, it will shed more light on the drivers of process innovations in a vital sector of the Czech economy. The hypotheses stated above and the factors that can drive firms process innovations are summarized in the conceptual framework depicted in Figure 1 below.

Figure 1

Conceptual framework model
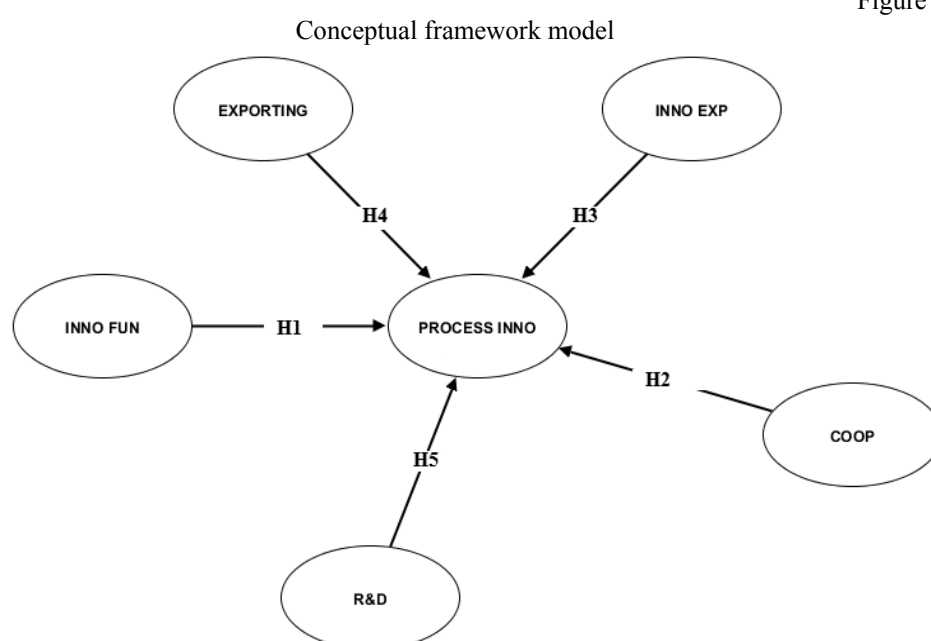
Note: INNO FUN= innovation funding, INNO EXP=innovation expenditures, PROCESS INNO= process innovations, COOP= innovations collaborations, R&D= research and development activities.

Data and method used

In pursuant to meeting the objective set for this paper, we used data from the Eurostat Community innovation survey (CIS) carried out between 2012-2014 for the empirical analysis. The CIS is conducted by the European Union (EU) to collect data on innovation activities at the firm and country-level in all member states. The CIS is a survey of innovation activity in enterprises that is designed to provide information on the innovativeness of sectors by type of enterprises, on the different types of innovation and on various aspects of the development of innovations, e.g. *(i) the objectives; (ii) the sources of*

information (iii) the public funding (iii) the innovation expenditures (Prokop, 2015). We, therefore, considered 280 companies in the automobile industry in the Czech Republic. These industries fall within the Nace 2 classification 29-30.

To analyse the relationship that exists between the variables, we used the structural equation model (SEM). The SEM offers a one-step, broad-spectrum and convenient framework for statistical analysis as it combines most of the numerous traditional statistics such as factor analysis, regression analysis, multivariate procedures, canonical correlation and discriminant analysis (Hox and Bechger, 1998). SEM is capable of modelling latent variables by considering all the numerous types of measurement errors, while it simultaneously allows researchers to test causal theories structurally. The path diagram in SEM allows for easy graphical visualization. Many studies have used the structural equation model to measure firms' innovation performance (Rhee et al., 2010; Gunday et al., 2011). The SEM shows standardized regression coefficients estimates (path coefficients) therefore it can be used to measure the relationships among latent variables.

All calculations in this paper were done with the Adanco statistical software. We first tested the statistical significance of the path coefficients by running the bootstrapping (Efron and Tibshirani, 1993). Bootstrapping enables calculating p-values, t-values and confidence intervals to measure the significance of PLS-SEM results, the results are presented below.

Measurement reliability and validity

We first provide the results for measures of reliability and validity of our constructs using the confirmatory factor analysis (CFA). There are three measurement approaches that can be used to measure constructs reliability (see Cheah et al., 2018), in this paper, we preferred the Jöreskog's rho (ρc) criteria to the remaining two. Jöreskog's rho (ρc) reliability measure relies on the sum of scores instead of construct scores (Henseler et al., 2016), so it's considered an upper boundary reliability measure (Hair et al., 2016). Minimum values of 0.70 designate acceptable reliability, with the maximum threshold of 1 (Chin, 2010).

From table 1 above, all our constructs passed the minimum acceptable 0.7 threshold. This indicates that all our constructs demonstrated to have moderate higher internal consistency reliability. The information about the cross-loadings, which provides information about the correlations among indicators and their corresponding constructs also show that loading values of equal to or greater than 0.40 are acceptable, but values less than this threshold need to be eliminated from the model (Gorsuch, 1974). From table 1, it is evident that all our construct had loadings attaining the minimum 0.40 limit.

Also, for our convergent validity assessment, we used the two most widely used measurement criteria namely the average variance extracted (AVE) and discriminant validity (Cheah et al., 2018). The AVE measures construct unidimensionality which some authors believe should be equal to or greater than 0.5, so as can be seen from table 1 and 2 above, all our constructs attained the minimum thresholds except for the collaborations construct. Also, for the discriminant validity, the Fornell-Larcker criterion (Fornell and Larcker, 1981) assumes that all the construct's average variance extracted (AVE) needs to

be higher than the squared inter-construct correlations of all the model' constructs. As can be seen from table 2 all our latent variables have values surpassing the highest correlation coefficients.

Table 1

Constructs reliability and validity measurements

Constructs	Items	Loadings	Jöreskog's rho (ρc)	AVE
Process Innovations	P1 P2 P3	0.811 0.777 0.827	0.847	0.648
Exporting	X1 X2	0.590 0.915	0.735	0.592
Innovation funding	F1 F2 F3	0.555 0.811 0.789	0.767	0.529
R&D	R	1.000	1.000	1.000
Collaborations	C1 C2 C3 C4 C5 C6 C7 C8	0.598 0.693 0.621 0.540 0.352 0.675 0.729 0.694	0.831	0.389
Innovation Expenditures	E1 E2 E3 E4 E5 E6 E7 E8	0.736 0.591 0.720 0.545 0.791 0.713 0.579 0.767	0.875	0.471

Source: Own calculations

Table 2

Fornell-Larcker discriminant validity

Construct	PROCESS INNO	Exporting	INNO FUN	R&D	COOP	INNO EXP
PROCESS INNO	**0.648**					
Exporting	0.046	**0.592**				
INNO FUN	0.198	0.037	**0.529**			
R&D	0.157	0.062	0.258	**1.000**		
COOP	0.220	0.073	0.224	0.213	**0.389**	
INNO EXP	0.421	0.073	0.296	0.477	0.272	**0.471**

Source: Authors calculations.
Note: squared correlations; AVE are boldened and shown in the diagonal.

Results and discussions

The structural Equation Model (SEM) is used to measure the effects of innovation funding, competitions in international markets (exporting), innovation expenditure, engaging in R&D, and innovation collaborations influence on process innovations within the automobile sector in the Czech Republic.

We begin the results and discussion by first looking at the predictive power of our model. From Figure 2 below, the predictive power (accuracy) of our model measured with the coefficient of determination (R^2) is 46%. Meaning that the variance explained in the endogenous variables, or in other words, all the determinants considered were probable to predict firms process innovations by 46%. This can be viewed as having a strong predictive accuracy going by Cohen's f^2 criteria (Cohen, 1988).

Figure 2

Path model for industries process innovations
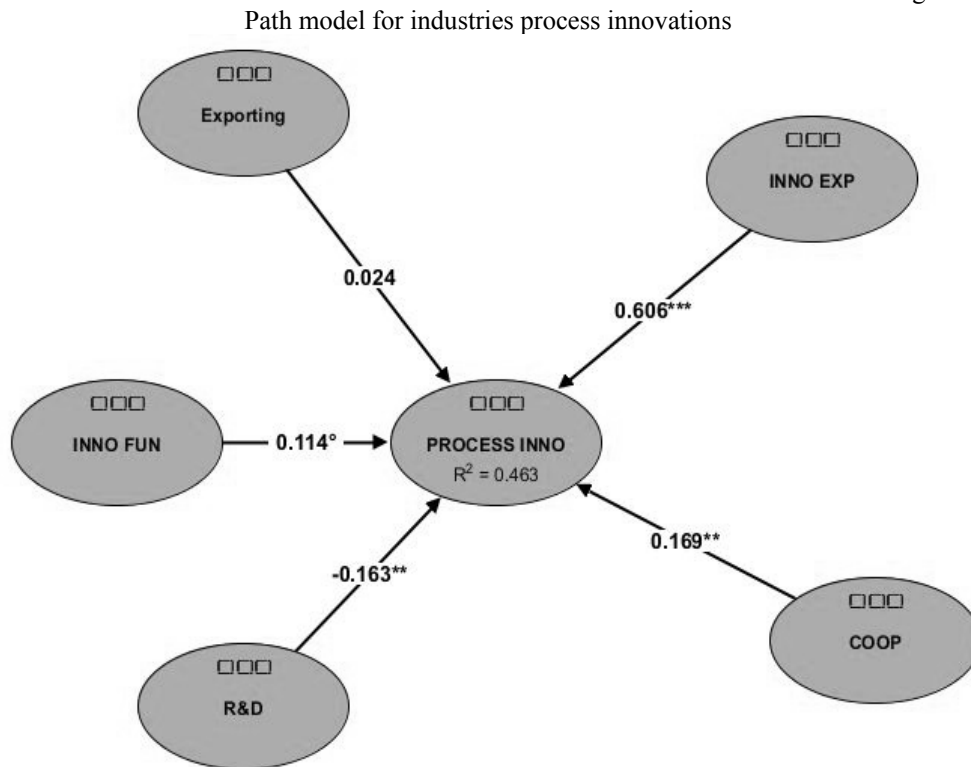
Note: significant at*; p<0.05, **; p<0.10, ***; P<0.001

Table 3 allows us to test the five hypotheses stated above. It can be evidenced that, public support for innovation i.e. funding from the EU, public funding from local or regional authorities as well as public funding from central governments were all positive and significant sources of funding for these industries process innovations. These funding

supports for innovation can help firms to introduce and carry out newly improved production method as well as helping firms to boost their distribution processes. This is because implementing new methods and process is costly and without an adequate amount of money, firms might not be probable to carry out these costly activities. From the above, we can, therefore, accept our first hypothesis (H_1) that innovation funding helps firms to improve their process innovation performance. Our results corroborate the findings of previous conclusions reached by (Czarnitzki et al., 2007; Artz et al., 2010).

Table 3

Standard bootstrap results

Relationships	coefficients	Mean value	Standard error	p-value (2-sided)	Decisions	Cohen's f^2
INNO FUN -> PROCESS INNO	0.114	0.114	0.067	0.087*	Accepted	0.015
COOP -> PROCESS INNO	0.169	0.181	0.062	0.006**	Accepted	0.035
INNO EXP -> PROCESS INNO	0.606	0.609	0.071	0.000***	Rejected	0.302
EXPORTING -> PROCESS INNO	0.024	0.026	0.043	0.577	Rejected	0.001
R&D -> PROCESS INNO	-0.164	-0.170	0.063	0.010**	Rejected	0.024

Source: Own calculations,
Note: significant at*; p<0.05, **; p<0.10, ***; P<0.001

Again, our results show that firms' collaborations are positive and statistically significant factor influencing process innovations. Firms collaborations with other partners such as those in the enterprise group, universities, government and other research institutes, clients and customers play a very significant role in influencing these firm's knowledge sharing and process innovations. When firms enter into synergies, they can acquire and absorb new knowledge through the numerous interactions, and these can subsequently influence their prospects to improve their supporting activities such as maintenance and operations. In addition, through these collaborations and competitions, firms can learn from their rivals especially those in the market group, and this can influence their possibility to introduce significantly improved production techniques to improve their goods and services. This indicates that although firm's innovation collaborations are having a positive influence on process innovations. The result of the effect size also shows that collaborations have an effect size of 0.035. This effect size result demonstrates that collaboration has a weak effect influence on process innovation (see Cohen, 1988). Our results confirm our second hypothesis (H_2), that firm's collaborations help to improve their process innovations. Our result is akin to another conclusion reached by other related studies (Un and Asakawa, 2015; Enkel et al., 2018).

The findings of the study back the claim that there is a positive and statistically significant relationship between innovation expenditures and process innovations. When firms have ample amounts of money, they can engage in R&D activities such as acquiring external

knowledge and machinery, in-house R&D and training for innovations. These expenditures can also contribute to firms' market innovation because it can help them to carry out activities such as conducting market research and advertising campaigns, which can go a long way to make them stand out among their competitors in the market. These expenditures can also contribute to firms tooling up process required for innovation and implementing new process within firms (Appleyard, 2015). The result also shows that firms innovations expenditures have the highest substantial direct effect on these firms process innovations (0.302). Our results have therefore proven contrary to our hypothesis H_3, but instead, firms expenditure devoted to innovation activities contributes to their process innovations. Our results, therefore, corroborate similar researches that all concluded that innovation expenditures contribute to firms process innovation and its related activities (Belderbos et al., 2015; Grimpe et al., 2017; Peters et al., 2017).

The results have demonstrated contrary to the claim that exporting firms are more likely to be process innovators. Our results rather showed an insignificant relationship between competing in international markets and its prospects to impact firms' process innovations. From our results, when these firms compete in other foreign markets, it doesn't have any probable positive influence on their ability to acquire and apply new and significantly improved methods of production as well as their distribution and supporting processes. Exporting, in this case, reduces the likelihood of contributing to these firms' production process and methods. Exporting has an unsubstantial direct effect on process innovation (0.001). This result, therefore, contradicts previous conclusions reached by authors such as (Damijan et al., 2010; Bratti and Felice, 2012; Johanson and Mattsson, 2015). Based on the following conclusion, we, therefore, reject our hypothesis H_4 that stated that exporting helps firms to improve their process innovations.

Finally, our findings have shown that there is a significant but negative relationship between engaging in research and development (R&D) and process innovation. When firms engage in R&D, it rather does not increase the likelihood of impacting on their prospect of executing newly improved production and distribution methods and supporting activities. The reason for the negative relationship can be that these firms do not expend more on conducting research and development activities. Research and development activities carried out by firms helps in generating new knowledge which can be of significant help to firms in overcoming challenges relating to their process and product innovations. This result also shows that conducting R&D has an unsubstantial effect on process innovations, meaning it has a relatively low relative impact on process innovation (0.024). This result contrasts the previous assertion that when firms conduct R&D, it influences their prospect of introducing new products and processes (Raymond and St-Pierre, 2010). The results mean that we reject our hypothesis H_5, because for these firms, conducting R&D was not probable to contribute positively to their process innovations.

Conclusion and practical implications

The aim of this study was to examine the factors that have the propensity to drive process innovations in the automobile industries in the Czech Republic. Knowledge of these

determinants will enable firms to focus their limited resources on these factors so that they can be innovative. Using the Structural Equation Model, we analysed 280 industries in the automobile sector in the Czech Republic. From the empirical results, the study found out that the major drivers of successful process innovations in these industries were the amount of expenditures devoted to innovations, collaborations with both internal and external partners, and innovation support or funding from governments. The study also came to an interesting conclusion which contradicted previous studies that when firms compete in international markets through exporting their goods and services, they can learn and gain new knowledge and ideas from other industries in the foreign countries that can be beneficial to their innovations domestically. Surprisingly, we reached the conclusion that conducting research and development rather had a negative influence on firms process innovation. The conclusion from here is that although conducting R&D increases the probability of effective innovation, it is not a prerequisite in the case of these industries.

Our research has confirmed that innovation expenditures have the highest effect on process innovation for firms in this sector. We, therefore, recommend firms to expend more on their innovation activities. Here financial support for innovations from governments can be utilized and channelled to cater for the numerous innovation activities carried out by these firms. Firms can also plough back their profits and reinvest them in their innovation activities. Lastly, these firms can also borrow from financial institutions to finance their innovations and their related activities.

The results of our analysis have again shown that firms innovations collaborations for knowledge and innovations have the highest probabilities to influence process innovations. These collaborations involve markets partners and customers, public and higher educational institutions among others. We, therefore, recommend these firms to intensify these technological collaborations and knowledge networks, when this is done then these firms can have access to reliable economic knowledge that can sustain their process and general innovations performance.

This study contributes to and build on the burgeoning literature on drivers of firm-level innovations. The findings of this study cannot be used for generalization purposes because of the following limitations. The sample size used for the analysis i.e. 280 firms was comparatively small bearing in mind the size and structure of all industries in the Czech Republic. Secondarily, this study focused on only internal factors driving firms process innovations, we therefore suggest further studies that will focus on other external factors such the business environment that can incentivise and increase firms' capability to implement new methods and activities for its innovations. This study can also be replicated in other Central and Eastern European (CEE) countries such as Slovakia, Hungary and Poland where the automobile industries play a key role in the growth and economic development to validate our findings.

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INDICATORS-MARKERS FOR ASSESSMENT OF PROBABILITY OF INSURANCE COMPANIES RELATEDNESS IN IMPLEMENTATION OF RISK-ORIENTED APPROACH

The article identifies that a fundamental change in the financial monitoring system is the development of mechanisms to improve the risk-oriented approach that is applied at the national level to the reporting entities of the primary financial monitoring and aimed at carrying out risk analysis and classification. Methodical study of assessment of the probability of relatedness of insurance companies based on the use of tools of graph theory and indicators-markers for assessment of the probability of relatedness of insurance companies. The indicators-markers include: assets, equity and insurance reserves, insurance premiums and insurance premiums owed to reinsurers. For testing systems technologies (based on the use of indicators-markers) to assess the probability of relatedness of insurance companies and determining its impact on the risk of money laundering, it has been used data from the financial statements of 15 Ukrainian insurance companies for 2006-2017 years that served as the statistical base. This made it possible to identify the relatedness of insurance companies, which would improve the risk-oriented approach to insurance companies, which are the reporting entities of the initial financial monitoring. An empirical test of the use of the indicator-marker "equity" was used to determine the correlation coefficients that characterize the tightness of relatedness of the investigated insurance companies, as well as the determination of the coefficients for building the insurance companies' relatedness graphs.
JEL: C53, G17, G21

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1. Introduction

The implementation of a risk-oriented approach to the system of anti-money laundering, terrorist financing and combating the financing of terrorism (hereinafter – the AML / CFT) is an urgent issue; therefore, it is important to improve the risk management process in this area, in particular by determining the level of relatedness between entities of the initial financial monitoring (hereinafter referred to as EIFM), in particular insurance companies.

In 2019 it was approved the Concept of combating terrorism in Ukraine (On the Concept of Combating Terrorism in Ukraine, 2019) based on the principles of the need to improve information, research, personnel and logistics of combating terrorism.

When conducting oversight in the field of prevention and counteraction AML / CFT, The State Financial Monitoring Service of Ukraine applies a risk-oriented approach to EIFMs.

Thus, the relevance of the study is due to the need of improvement of state regulation of financial monitoring that requires a network discovery tools aimed at AML / CFT when introducing risk-oriented approach in accordance with international standards (Vnukova, 2018).

According to the Strategy for the development of the system of prevention and counteraction to the legalization (laundering) of proceeds from crime, the financing of terrorism and the financing of the proliferation of weapons of mass destruction for the period up to 2020 (On approval of the Strategy for the development of the system of prevention and counteraction to the legalization (laundering) of proceeds from crime, terrorist financing and financing the proliferation of weapons of mass destruction for the period until 2020, 2015)key activities are consistent and effective fight against corruption and improving the forms and methods of improving risk-oriented approach to financial monitoring.

The relevance of the research is also due to the need of improvement of state regulation of financial monitoring that requires a network discovery tools aimed at AML / CFT when introducing risk-oriented approach in accordance with international standards (Vnukova, 2018; Vnukova, Hontar, Vorotyntsev, 2018).

Consequently, methodical study of assessment of the probability of insurance companies' relatedness to improve the management process risks of financial monitoring indicators through the use of markers, which will promote the use of the risk-oriented approach in ensuring AML /CFT is a particularly pressing issue that requires investigation.

2. Literature overview

Risk assessment and application of a risk-oriented approach are the first recommendations of the international standards of the Financial Action Task Force on Money Laundering (hereinafter – FATF) (FATF Recommendations, 2012).

That is why the developing and implementing AML / CFT measures using a risk-oriented approach is still in the early stages of development. Countries and institutions need to be supported to be confident to embrace international efforts on proportional regulation and not be unduly conservative (Malady, Buckley, Arner, 2014).

FATF has not defined "risk" for purposes of the risk-oriented approach. The absence of a clear definition complicates the identification of low-risk products. FATF do provide an example of a risk matrix that can be used to identify low-risk banks, but the example is based on assumptions and generalizations that are not sustainable (de Koker, 2009).

In addition, much attention is paid to systems relatedness research (Poliakova, Simarova, 2014; Chepyk, 2013).

Thus, in the article by Polyakova A. H. (Poliakova, Simarova, 2014) relatedness is seen as a property of space, which is characteristic of the control object in the course of economic policy. The work of Chepik A. E. (Chepyk, 2013) proposed to evaluate the unevenness of interregional development in different spheres of the economy using the non-uniformity index and to investigate the influence of different factors on the magnitude of these coefficients.

The legislation of Ukraine also considered the issue of relatedness of individuals. The sources (Tax Code of Ukraine, 02.12.2010; On approval of the Instruction on the procedure for regulating the activity of banks in Ukraine: Resolution of the Board of the National Bank of Ukraine, 2001; International Accounting Standard 24 Related Party Disclosures: IASB Standard 01/01/2012 5: Standart IASB, 2012; On Approval of Regulation (Standard) of Accounting 23 "Related Party Disclosures": Ministry of Finance of Ukraine, 2012; On approval of the Regulation on determining the size of credit risk by active banking operations by banks of Ukraine: Resolution of the Board of the National Bank of Ukraine, 2016)found that under the related parties are considered legal entities belonging to the same group (parent and subsidiaries) are joint owners of substantial participation (or owners of substantial participation in each other), investors, end-beneficiaries using financial services synergies and are the only source of funding. As the definition of relatedness features out for exclusivity, economic dependence, common infrastructure, lack of transparency, the purpose of the use of funds, documentation, operational standards, debt and credit standing, internal control instruments, interest rates, fees and rates, collateral and guarantees.

However, the consideration of the relatedness of individuals in assessing the risks in the field of financial monitoring for insurance companies, which are EIFMs, has hardly been investigated. The methodological support and criteria for determining the connectedness of persons in scientific works and national legislation have not been sufficiently considered. The authors attempted to evaluate the level of relatedness of insurance companies, which are EIFMs by markers-indicators, using the graph theory toolkit.

The article aims to study the composition of indicators marker for assessing the probability of relatedness of insurance companies will improve the management risks of financial monitoring on the basis of selected indicators-markers, which will promote the use of the risk-oriented approach in ensuring AML / CFT.

3. Methodology

When conducting oversight in the field of prevention and counteraction AML / CFT, The State Financial Monitoring Service of Ukraine applies a risk-oriented approach to EIFMs.

Fundamental changes in the system of financial monitoring based on development mechanisms of improving risk-oriented approach at the national level applicable to reporting entities and aimed at analyzing and classifying the risk of financial transactions.

Limited methodological support required to assess the relatedness of insurance companies that are EIFMs, significantly reduces the ability to assess and manage risks in the area of financial monitoring.

Justification of assessment of the probability of insurance companies' relatedness according to the authors should be based on the use of tools of graph theory and indicators-markers.

In Ukraine, the insurance market is in a phase of active growth and more and more citizens are using the services of insurance companies, in addition to mandatory legislation. However, legislation regulating the activities of insurance companies was changed, and the result of these changes was the imposition of more stringent requirements to the terms of insurance companies, which led to the elimination of some of them (Achkasova, 2019).

To assess the probability of relatedness of insurance companies it has been used the graph theory (Kavun, Vorotintcev, 2016; Kavun, Kalashnikov, Kalashnykova, Cherevko, 2015; Kavun, 2015), that can be applied in all areas where are the system elements and relationships between them (Rose, Kolari, 1995).

Graph theory is one of the most common and popular mathematical models in many fields of science and technology.The image in the form of a set of points on a plane and lines drawn between some of them, has become a convenient and visual form of reflection of certain processes and phenomena (Christofides, 1975).

Due to the introduction of new requirements of international standards for the implementation of risk-oriented approach to control the activity of EIFMs and the fact that it is not an arbitrary option for the state and the obligations of the entities of primary financial monitoring, the issue of scientific and methodological support for implementation the risk-oriented approach needs further development, as financial institutions are required to identify, evaluate and take effective measures to reduce the risks associated with money laundering and terrorist financing (Vnukova, Hontar, Andriichenko, 2018).

In the context of the development of the Ukrainian economy, the issue of assessing the relatedness of financial institutions is quite relevant, as there are ongoing transactions in the field of money, so the existence of dependency between financial institutions may indicate some negative consequences of their activities.

For example, schemes for money laundering, tax evasion, etc. It is important for companies operating in the financial services market to be independent, which will promote

competitiveness and prevent monopolization. However, if there is some dependency between financial institutions, this can be a hint of corrupt schemes (Vorotyntsev, 2016).

Determining the level of relatedness of financial companies will promote a risk-oriented approach in providing AML / CFT (Vorotyntsev, 2016).

The relatedness of financial corporations, which are EIFMs, is an additional factor that must be considered when deciding to provide financial services. An example of financial institutions' relatedness may be the existence of joint clients that attract credit, that is, the affiliated financial companies have a common source of credit repayment, and thus have a common economic risk, or may form networks to transfer funds (Vorotyntsev, 2016).

For the study of relatedness, we propose to use graph theory, which has recently been attracting more and more attention from specialists in various fields of knowledge. The graph is one of the most common and popular mathematical models in many fields of science and technology. The image in the form of a set of points on a plane and lines drawn between some of them, has become a convenient and visual form of reflection of certain processes and phenomena(Vnukova, Hontar, Vorotyntsev, 2018).

Other theories are related to graph theory: cycle theory, which is a set of different models with some simplifications that formalize the process of economic dynamics; wave theory – mathematical theory that represents the process of development and change of society or financial markets in the form of recognizable models; theory of economic growth, which explains the long-term directions of growth of economically developed countries (Sorak, Urosevic, 2014).

Graph theory originated in 1736, whose father is a Swiss mathematician Leonhard Euler (1707-1783 years.). In his first paper on the theory of graphs published in the St. Petersburg Academy of Sciences, he has decided to a widely-known problem called "problem of Konigsberg bridges(Graph theory).

"The city of Konigsberg (now Kaliningrad) located on the banks of the river Pregel (Pregel) and two islands. Different parts of the city were connected by seven bridges. On weekends, residents carried walking city. The question was whether to take a walk in a way that came out of the house back, passing only once for each bridge? Euler introduced in every part of the land as a point, and bridges marked lines (edges) that connect these points. Thus, was obtained "graph". Euler showed, from whatever vertex they began to bypass, one cannot bypass the whole graph and go back without passing any edges twice. In order for such a bypass to exist, it is necessary that in each vertex of the graph there be as many edges entering it as there are and leaving it, that is, in each vertex of the graph there must be an even number of edges (Graph theory).

Therefore, a set consisting of a finite number of elements denoted by the letters X1, X2,…, Xn, and the set itself by the letter X is considered. Each element Xi, which belongs to X, put in line zero, one or more elements of X; then we can build, using the terminology of set theory, a "graph", marking through a D law that represents this line, we write symbolically graph G = (X, D). The graph can be represented using the drawings. This is called "graph representation using directional arcs". The graph can also be represented by a table with

two inputs or a matrix. In set theory, "graph" is called any reflection of the set in itself; the symbol D is this reflection (Kofman, DeBazei, 1968).

The element of the set forming a graph is called a "vertex". Some authors also call the vertices "points". An oriented pair (Xi, Xj) of vertices Xi and Xj is called an arc. A path is a series of arched arcs that allow it to pass from one vertex to another. An outline is a path whose initial vertex coincides with the end. The loop is an arc whose beginning and end coincide. Path or contour length is the number of path or contour arcs (Kofman, DeBazei, 1968).

If the two vertices are connected by an arc that starts in any of them, then we say that between these peaks has an edge. Therefore, the concept ribs equivalent to the concept of "non-oriented" graph (Kofman, DeBazei, 1968).

The chain – a sequence of linked edges, i.e. sequence of arcs linked without regard to their orientation. Every way is obviously a chain, but the chain is always a way (Kofman, DeBazei, 1968).

Columns by type are divided into oriented and non-oriented. Oriented graph (or orgraph) called a couple of sets V and E, where V – is not empty finite set and E – the set of ordered pairs of elements of the set V. In this case, the elements of the set V are called vertices (or nodes), and a plurality of E – curves (or oriented ribs) (Kofman, DeBazei, 1968).

If a pair of vertices a and b is an arc, it denoted (a, b). The top is called a primary, and the top b – final. Doug (a, a) is called a loop. The non-oriented graph consists of three types of graphs: ultohraf (can have loops and multiple edges) ultohraf (may have multiple edges, no loops), a simple graph (without loops and multiple edges) (Bartysh, Dudzanyi, 2007).

Pseudohraf is called a pair (V, E), where V – non-empty finite set and E – family unordered pairs of elements of the set V (not necessarily distinct). The term "family" means that the elements of E (edges) are repeated. Ribs, connecting the same pair of nodes, called multiple (or parallel) edges. In some cases, view graphs, which can connect two peaks several ribs. There multyhraf concept – a pair (V, E), where V – non-empty finite set, and E – family unordered pairs of different elements of the set V. A simple graph G is called a couple of sets V and E, i.e. G = (V, E), where V – non-empty finite set and E – set of unordered pairs of different elements of the set V. The vertex a and b in a non-oriented graph is called adjacent if [a, b] is an edge. Two adjacent rib call if they have a common end. The top edge is called incident and if the top is the end of the rib. So, contiguity shows the relationship between homogeneous graph elements, and incidence – between heterogeneous elements if they have a common end (Bartysh, Dudzanyi, 2007).

One of the main properties of a graph is the ability to be connected. A graph is called connected if any pair of its vertices is connected by a simple circuit. The relationship of the vertex relatedness is an equivalence. Relationship equivalence classes are called graph relatedness components. The number of connected components is designated as k (G). G is a connected if and only k (G) = 1. Not connected graph has at least two components (Graph theory).

It is essential to structure the causal relationships between the indicators for its assessment, which allows identifying the most significant factors affecting the deviations of both individual indicators and the change of sub-indices (Kolodiziev, Chmutova, Lesik, 2018), substantiation of the composition of indicators for evaluation (Ponomarenko, Kolodiziev, Chmutova, 2017).

Analysis of the frequency of absolute indicators of relative (formed from Achkasova, 2013), characterizing the activities of insurance companies, which confirms the hypothesis about the feasibility of their use for the formation of the indicator markers to assess the probability of relatedness of insurance companies are listed in Table. 1.

Table 1

Selection of indicator markers to assess the probability of relatedness of insurance companies

Indicator	The formula for calculating	Indicators-markers, to assess the probability of relatedness of insurance companies				
		Assets	Equity	Insurance reserves	Premiums	Premiums owed to reinsurers
Factor receivables	(Accounts receivable / Capital	-	+	-	-	-
Risk assets ratio	Accounts receivable: (+ Total Premiums received indemnities from reinsurers)	-	-	-	+	-
Stock Risk Factor	The amount of investments in shares / assets	+	-	-	-	-
Reverse solvency ratio	Liabilities / Equity	-	+	-	-	-
Insurance risk factor	(Premiums – premiums owed to reinsurers) / equity	-	+	-	+	+
Loss ratio of insurance operations	Insurance indemnity / insurance premiums	-	-	-	+	-
The level of capital to total assets	Capital / Assets	+	+	-	-	-
Retention risk factor	Insurance premiums – premiums owed to reinsurers / insurance premiums	-	-	-	+	+
Adequacy of insurance reserves ratio	Net insurance reserves / average volume of insurance premiums for the last 3 years	-	-	+	+	-
Factor participation of reinsurers in insurance reserves	The share of reinsurers in insurance reserves / insurance reserves	-	-	+	-	-
The ratio of net insurance reserves to	Net insurance reserves / capital	-	+	+	-	-

Indicator	The formula for calculating	Indicators-markers, to assess the probability of relatedness of insurance companies				
		Assets	Equity	Insurance reserves	Premiums	Premiums owed to reinsurers
capital						
coefficient of independence	Shareholders' equity / debt capital	-	+	-	-	-
Solvency margin (wages fund)	Assets – Intangible assets liabilities, including insurance	+	-	-	-	-
The required solvency margin (NZP1)	(Premiums – 0,5 × premiums transferred to reinsurance) × 0,18	-	-	-	+	+
Return on assets ratio	Net profit (loss) / average annual value of assets	+	-	-	-	-
Return on equity ratio	Net profit (loss) / average annual equity value	-	+	-	-	-
Profitability Ratio insurance	Net profit (loss) / premiums	-	-	-	+	-
Return on assets ratio	Investment income / average annual value of assets	+	-	-	-	-
safety factor	Capital / Insurance reserves	-	+	+	-	-
The coefficient of financial capacity	(Insurance reserves Equity +) / (premiums – premiums owed to reinsurers)	-	+	+	+	+
The share of assets attributable to one employee	Assets / Employees	+	-	-	-	-
Stability factor management	Administrative costs / premiums	-	-	-	+	-
Change in book value of assets	The market value of assets / Balance sheet assets	+	-	-	-	-
Currency risk ratio	The net open foreign exchange position / Equity	-	+	-	-	-
The frequency of the use of indicators in terms of markers		7	10	5	9	4

Thus, as can be seen from the table 1, indicator markers that are most used in calculating the assessment of insurance companies are "equity", the frequency of use of which was 10,

and "premiums" is equal to the frequency of use 9. Other 3 indicators are also significant because it is also used for the assessment of insurance companies.

Key indicators of insurance companies from the insurers' point of view are indicators of financial solvency and reliability (this is why insurance companies in Ukraine are the subject of constant supervision and control by the state regulatory activities through a specially authorized body represented by the National Commission for State Regulation of Financial Services Markets (On Amendments to the Law of Ukraine "On Insurance", 2001), because when concluding an insurance contract an insured expects to avoid losses when the insured accident occurs, and in case of stable financial conditions the insurer is able to minimize the loss of the insured.

The insurance company is considered insolvent if its assets are inadequate or unavailable at certain times for payments to the insured when the insured event occurs. The ability to cover the losses of the insured depends on the size of the adequacy of insurance reserves.

Guarantor for the solvency of insurers is formed by the insurer's insurance reserves and equity to meet obligations (Achkasova, 2013).

Assets characterize the amount of money the insurance company that invested in securities, real estate, accounts and deposits with banks, other assets and rights and other requirements (Financial information of the TAS insurance group).

Equity is the own source of an insurance company, contributed by its founders and participants to the property of the insurer, or left by the insurer for net profit earned during its business. The main source is the equity share capital, which shows the level of interest in the owner of the insurer. Premiums characterize the amount of funds received by the insurer under contracts of insurance and reinsurance and reflect the insurer to ensure future payments of insurance compensation (Financial information of the TAS insurance group).

The development of the insurance market of Ukraine is closely associated with the instruments that use domestic insurers to manage low capitalization, including coinsurance and reinsurance services. Reinsurance helps insurance companies to take very large and expensive risks (Pukala, Vnukova, Achkasova, Smoliak, 2017).

Insurance reserves characterize the insurer's future payment of insurance indemnity and determine the degree of placement of funds at the expense of which the insurance company's liabilities are covered, in investment assets and funds (Financial information of the TAS insurance group).

Evaluation of relatedness of insurance companies and the influence of these circumstances, the risk of money laundering invited to perform in the following stages: forming information database study (this phase involved the selection and formation of a plurality of insurance companies for the study). After forming the research information base, that is, selecting and forming a plurality of insurance companies, the close relationship of the investigated financial institutions was determined, which included the calculation of the correlation coefficient, as well as the correlation coefficient in the constructed connectedness graph of the insurance companies.

The correlation coefficient is a measure of the relative connection between the two factors. Therefore, the correlation coefficient always ranges from -1 to +1. A positive correlation coefficient indicates a direct link between performance and negative – about reverse connections (Karaeva, Varava, 2016).

After calculating the correlation coefficients, a matrix of their values was constructed using the one-to-one principle.

Also, based on the properties of the matrix, it is found that the secondary diagonal of the matrix always contains a value of "1", since each financial institution is independent of itself. The correlation matrix is symmetric with respect to the minor diagonal, according to which the correlation coefficient is always 1, because the correlation is calculated across all institutions (Karaeva, Varava, 2016). In this way, such a matrix can be regarded as diagonal (Kavun, Mykhalchuk, Kalashnykova, Zyma, 2012).

Selection of closely related insurance companies based on the construction of a two-dimensional binary matrix. At this stage, closely related insurance companies (Chaddock scale) for which the correlation coefficient module exceeds 0.7 and weakly related insurance companies for which the correlation coefficient module is less than 0.7 are identified for further investigation.

The proposed method of identifying the relationship of insurance companies allows considering both direct and inverse relationships between insurance companies based on a dedicated bipartite graph (divided into two subsets).

Performance evaluation of relatedness insurers calculated as:

$$X_1 = \frac{1}{j}\sum_{i=1}^{n}\left(p_{ij}\,\middle|\,p_{ij} > 0.7\right),\ p_{ij} \in \{B\},\ i,j = \overline{1,21}, \tag{1}$$

where n – the number of insurance companies, n = 15;

pij – item correlation matrix density;

$$X_2 = \frac{1}{j}\sum_{i=1}^{n}\left(p_{ij}\,\middle|\,p_{ij} \leq 0.7\right),\ p_{ij} \in \{B_{ij}\},\ i,j = \overline{1,21}, \tag{2}$$

$$X_3 = X_1 - X_2, \tag{3}$$

$$X_4 = \frac{1}{j}\sum_{j=1}^{n}\frac{X_{1j}}{X_{1j}+X_{2j}}(\%),\ X_{1j} \in \{X_1\},\ X_{2j} \in \{X_2\},\ i,j = \overline{1,21}, \tag{4}$$

$$X_5 = \frac{1}{j}\sum_{j=1}^{n}\frac{X_{2j}}{X_{1j}+X_{2j}}(\%),\ X_{1j} \in \{X_1\},\ X_{2j} \in \{X_2\},\ i,j = \overline{1,21}, \tag{5}$$

$$X_6 = \sum_{j=1}^{n}\sum_{i=1}^{n}\left(p_{ij}\,\middle|\,p_{ij} > \frac{1}{n\cdot(n)}\sum_{i=1}^{n}\sum_{j=1}^{n}p_{ij}\right), \tag{6}$$

$$X_7 = \frac{X_{62}}{X_{61}+X_{62}},\ p_{ij} \subset \{B\},\ i,j = \overline{1,21}. \tag{7}$$

Further, there is a problem with the calculation of indicators, characterizing the relatedness sets for financial institutions insurance companies with direct and inverse relationships, that is presented in empirical results.

4. Empirical results

Thus, it has been selected five indicators-markers (assets, equity, insurance premiums owed to reinsurers, insurance premiums, and insurance reserves) that characterize the financial stability and reliability of the insurance company to reflect its growth and dynamic development, so they describe the best the status and activities of insurance companies.

Empirical testing of the use of marker indicators involved determining the correlation coefficients that characterize the tightness of the links of the investigated insurance companies, as well as determining the coefficients of relatedness in the constructed graphs of the relatedness of insurance companies. Selection is closely connected insurance companies held on the basis of building a two-dimensional binary matrix. At this stage for the further research, there have been highlighted the closely connected insurance companies, for which the module correlation coefficient greater than 0.7, and loosely connected insurance companies, which module of the correlation coefficient is less than 0.7. The next step defines the importance of relatedness for the insurer's indicator marker. To investigate the relatedness, the graph theory has been used. The graphs construction was carried out using a Graphoanalizer program, which is an environment for the visualization of graphs and provides the ability to create and manipulate graphs to visually display the results of the algorithms. The environment supports the work with oriented and simple graphs, loaded and unloaded.

To assess the probability of relatedness of the insurance companies it has been chosen 15 insurance companies which occupy leading positions in the rankings of insurance companies in Ukraine for 2006-2017 years, formed from source (Forinsure) and performed calculations using formulas 1-7.

The approbation of marker-indicators have the following results:

The insurer indicator 'the insurer's assets" concludes that the studied insurance companies are mostly connected in the volume of their sets, since the average share of insurance companies with direct ties with high connection is 60% and the coefficient of inconsistency for them is 40%. Much smaller is the value of this indicator for backhaul insurance companies – 6.67%, that is, in the study group of insurance companies, direct relationships prevail.

According to the "Insurance reserves" indicator, insurance companies are largely unaffiliated, since the average proportion of high-closure direct-to-link insurance companies is 40% and their non-affiliation ratio is 60%. Much higher is the value of this indicator for backhaul insurance companies – 53.33%, that is, in the studied group of insurance companies, the reverse relationship prevails.

According indicator marker "Insurance premiums, reinsurers adequate" insurance companies are mostly incoherent, as the average share of insurance companies with direct connections with high connection tightness is 40% and unrelatedness factor for them is 60%. Much less is this value for insurance companies with the reverse connections – 13.33%, i.e. the research group of insurance companies dominate the direct relationships.

According to the indicator "Premiums owed to reinsurer", insurance companies are largely unrelated, since the average proportion of high-bonded direct-link insurance companies is 40% and the non-affiliation ratio for them is 60%. Much less is the value of this indicator for backhaul insurance companies – 13.33%, that is, in the study group of insurance companies, direct relationships prevail.

An example of a detailed validation of a technology system (based on the use of a designated equity indicator) to assess the reliability of insurance companies' relatedness was to determine rank using the Microsoft Excel[TM] rank, as shown in Table 2.

Table 2

The calculated average for the sets of insurance companies

The set of insurance companies	The average proportion of organizations with a strong correlation ($> \pm 0,7$) – X1%	The average proportion of institutions with weak correlation ($< \pm 0,7$) – X2%	The difference between tightly and loosely connected- X3%	The coefficient of relatedness – X4	No relatedness factor – H5	The average proportion of institutions with more average correlation – X6%	The average proportion of establishments with less correlation average – X7%
Insurance companies with direct connections	33.33	66,67	-33.34	0.33	0.67	53.33	46.67
Insurance companies with reverse connections	12.89	87.11	-74.22	0.13	0.87	40	60

As seen in Table 2, the results show that the insurance companies are connected and independent according to the equity indicator. These insurance companies are mostly connected, since the average share of insurance companies with direct connections with high tightness due amounted to 53.33% and the rate for them unrelatedness is 46.67%. Lower the value of this index for the insurance companies of the reverse connections – 40%, i.e. the research group of insurance companies dominate the direct relationships.

The data on the ranks of the ratio of insurance companies and the number of relationships of insurance companies are presented in Table 3.

Table 3

Ranks relatedness ratios for insurance companies and the number of connections of the insurance companies

Serial number of the insurance company	A plurality of direct connections		In the set of reverse connections	
	Rank insurance company	Number of the connections insurance company	Rank insurance company	Number of the connections insurance company
1	8	5	1	0
2	4	7	9	1
3	1	8	10	1
4	2	8	13	1
5	9	4	11	1
6	5	7	1	0
7	10	0	1	0
8	10	0	1	0
9	6	7	12	1
10	10	0	1	0
11	10	0	15	7
12	10	0	1	0
13	7	6	8	1
14	3	8	14	1
15	10	0	1	0
The average weight of relatedness	4		0.93	

As seen from Table 3, to avoid affecting the image of the insurance companies, the authors decided to impersonate data, replacing the names of insurance companies on the numbers.

Data giving in Table 3 shows, that the average weight of relatedness is 4 insurance companies in the set of straight bonds and 0.93 plural of reverse connections. The average weight of the insurance company's relatedness shows the average number of other insurance companies, among which is the connection for the performance indicators set among all insurance companies.

That is, each insurance company on average has a direct connection with 4 other insurance companies and an inverse relationship with one insurance company. Based on the binary matrix, it was built a relationship's graph for insurance companies (Fig. 1). Construction was carried out graphs using the program Graphoanalizer (Graphoanalizer, 2019), which is an environment for visualization of graphs and provides the ability to create and manipulate graphs to visually display the results of the algorithms. The environment supports oriented and simple graphs loaded and unloaded.

Figure 1

General view of a non-orientated link graph for direct-link insurance companies
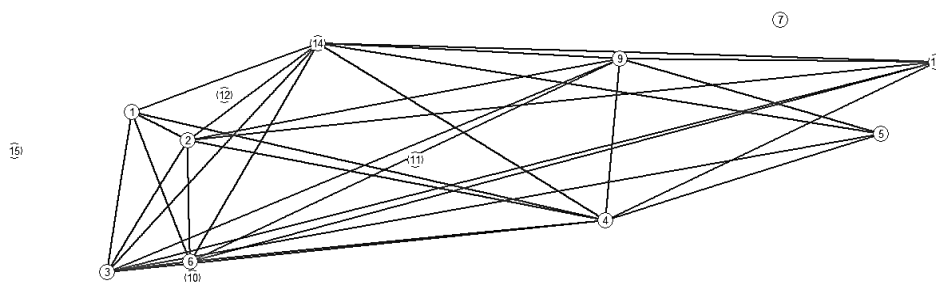
According to the graph's connections (Fig. 1) for insurance companies concluded that, for example, insurance companies number 1, 3, 4, 5, 13, 14 and others have many links with the others (graphical form provided opportunity to view all available links), it is possible to assume that these insurance companies may have common customers.

Meanwhile, insurance companies № 7, 8, 11, 12, 15 have no affiliation with other insurance companies analyzed.

The next step in the study of the obtained set of graphs is to establish, by known algorithms, graph theory of paths of achievement from one vertex to another in a graph (Fig. 2).

Figure 2

Highlighting the path of achievement from top № 3 to top № 9
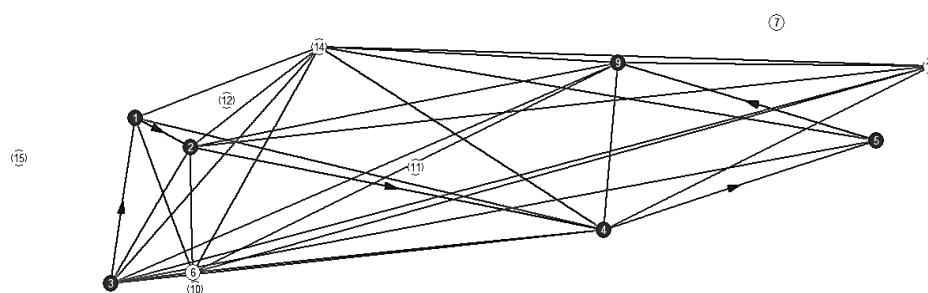
As shown in Fig. 2, the resulting graph can contain some areas of achievement, as shown for example, from the top to the top №3 №9. That is, considering the top insurance

companies, suggests the presence of hidden communication insurers number 1, 2, 3, 4, 5 and 9.

The next step is the transformation of non-oriented graph to approximate, as shown in Fig. 3.

Figure 3

View of an oriented graph of relationships of insurance companies
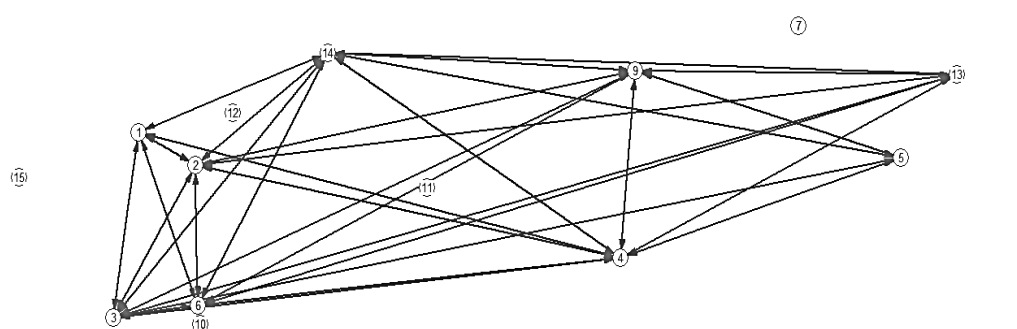
The type of oriented graph (Fig. 3) provided an opportunity to identify and demonstrate all possible directions of relations between the studied insurance companies. All of them are directly subject to further risk assessment of AML / CFT.

The new stage of the analysis given set of graphs calculated the chromatic number of the graph (Fig. 4), which in this case, is 7.

Figure 4

Selection of contours or cycles that can be created by insurance companies
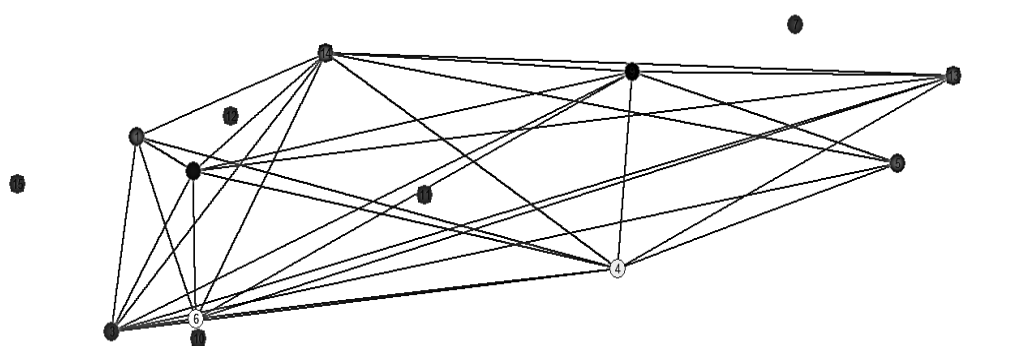
In this case, the interpretation of the insurance company may indicate that there are a sufficient number (7) of insurance companies affiliated with each other in the insurance market but established by different beneficiaries.

The next step in analyzing the resulting set of graphs is to calculate all clicks on the graph. The maximum click – a (14, 13, 9, 6, 4, 3, 2), that is not contained in any other click (Fig. 5).

Figure 5

Finding the maximum click on the insurance company relationship graph
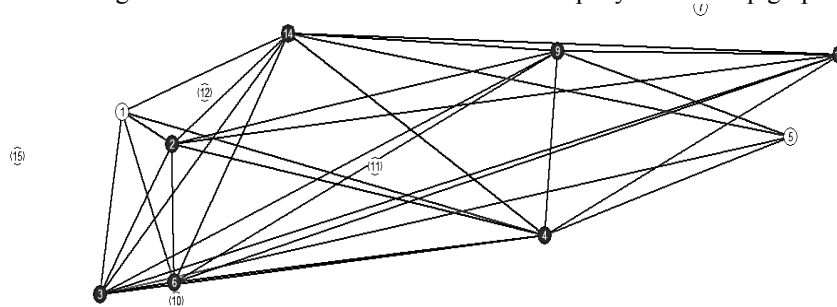
From the calculated example (Fig. 5) it is apparent that the largest conglomerate of many insurance companies contains 7 (click number) of them. The total number of clicks received in the column confirms the existence of links between insurance companies, which can be used for further verification to identify the links.

It can also be noted that the resulting graph is perfect because its chromatic number is equal to the click number (Kavun, 2016).

One of the variants of analysis of the obtained set of graphs is the task of finding the minimum spanning tree. A minimum spanning tree for a non-orientational graph is a spanning tree that has the minimum possible weight as the sum of the weights of the edges that belong to it. For the insurance companies surveyed, the minimum spanning tree was not detected. The volume of insurance services can serve as the weight of the rib.

The general view of the non-orientated link graph for backlink insurance companies is shown in Fig. 6.

According to the obtained graphs of links for insurance companies (Fig. 6), it is concluded that, for example, insurance companies number 11 has a large number of relationships with others (the graphical form made it possible to visually see all available links), that is, we can assume that these insurance companies may have joint clients, reinsurance, etc.

Meanwhile, insurance companies № 6, 7, 8, 10, 12, 15 have no affiliation with other insurance companies analyzed.

The next step in the study of the obtained set of graphs is to establish, by known algorithms, graph theory of paths of achievement from one vertex to another in the graph (Fig. 7).

Figure 6

General view of the non-orientated link graph for backlink insurance companies
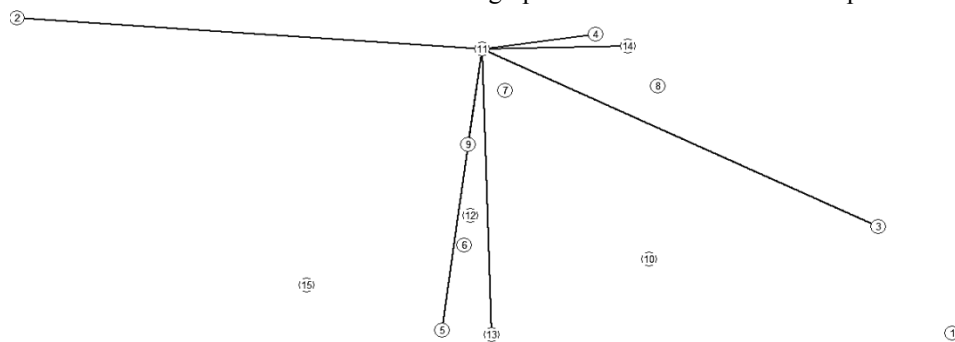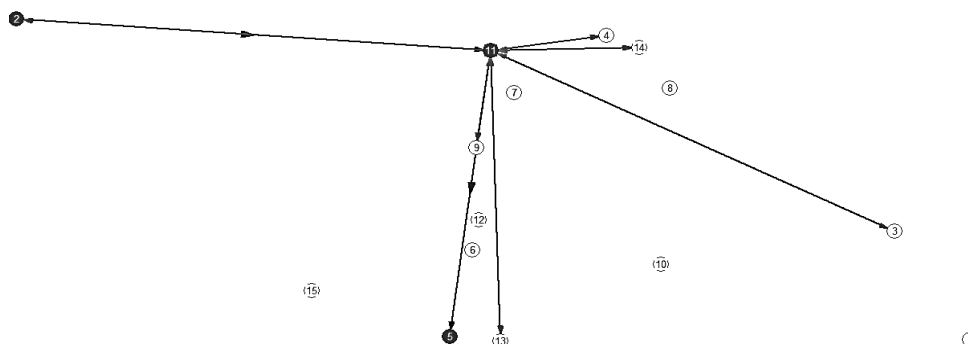

Figure 7

Highlighting the path of achievement from top №2 to top №5, which are insurance companies (2) and (5)

As can be seen from Fig. 7, the resulting graph may contain some directions of achievement, as given for example, from vertex № 2 to vertex № 5. That is, considering the tops as insurance companies, we can assume that there is a hidden connection of insurance companies №2, 5, 11. Similarly, all possible connections are calculated for the purpose of their careful checking for risk assessment.

The next step is to convert the graph from non-orientable to approximate, as shown in Fig. 8.

The type of an oriented graph (Fig. 8) made it possible to identify and clearly demonstrate all possible directions of relations between the studied financial institutions. All of them are subject to further review to determine the risk of money laundering, terrorist financing and

the financing of the proliferation of weapons of mass destruction in the presence of hidden links.

At the new stage of analysis of the obtained set of graphs, the chromatic number of the graph (Fig. 9) is calculated, which in this case is 2.
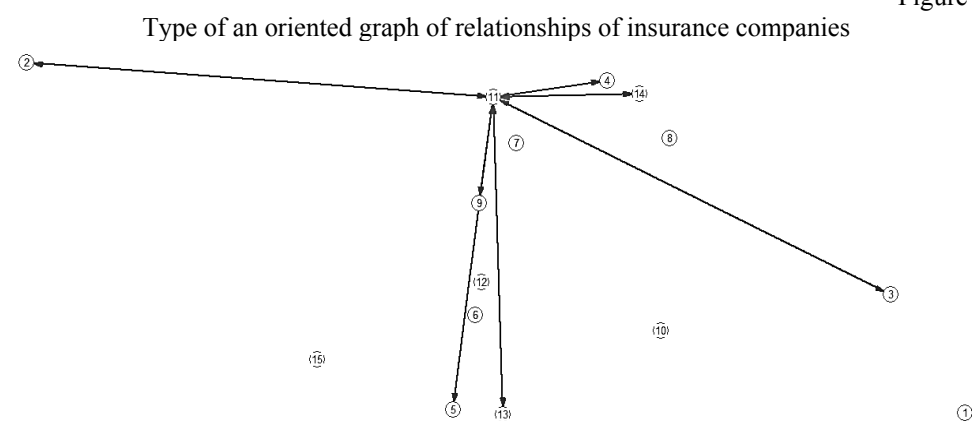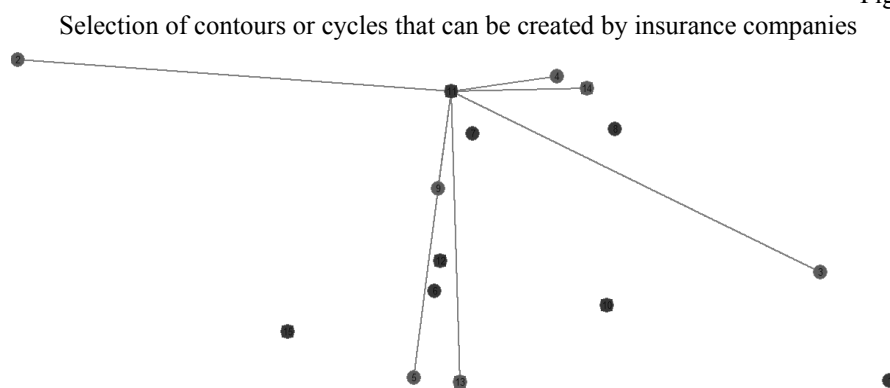
Figure 8

Type of an oriented graph of relationships of insurance companies

Figure 9

Selection of contours or cycles that can be created by insurance companies

In this case (Fig. 9), the interpretation regarding the insurance company may indicate that there is a sufficient number (2) of related, but based on, different beneficiaries of insurance companies in the studied insurance market. The next step in analyzing the resulting set of graphs is to calculate all clicks on the graph. The maximum click is (14, 11); that is, it is not contained in any other click (Fig. 10).

The calculated example shows that the largest conglomerate of many insurance companies contains 2 (click number) of them. The total number of clicks received in the column confirms the existence of links between insurance companies, which can be used for further

verification to identify the links. It can also be noted that the obtained graph is perfect because its chromatic number is equal to the click number.One of the variants of the analysis of the obtained set of graphs is the task of finding the minimum spanning tree, which for a non-orientated graph has the minimum possible weight as the sum of the weights of the edges that belong to it. For the insurance companies surveyed, the minimum spanning tree was not detected. The volume of insurance services can serve as the weight of the rib.

Figure 10

Finding maximum count clicks

The final analysis of the obtained data to confirm the hypotheses regarding the connection between the insurance companies was performed based on the calculation of the coefficients of connection of the insurance companies, presented in Table 4.

Table 4

The final analysis of the data relatedness for insurer's indicator-marker "equity"

The set of insurance companies	The level of relatedness, %	Level of no relatedness, %
Insurance companies with direct connections	33.33	66.67
Insurance companies with reverse connections	12.89	87.11

Thus (Table 4), the level of relatedness of insurance companies is one third, which requires the development and improvement of measures to assess the risk of "money laundering" by those insurance companies that fall into their list of affiliated insurance companies. Therefore, the proposed tool for managing money laundering risks based on determining the level of relatedness of insurance companies is promising and can be used to improve the risk-oriented approach to EIFMs.

5. Concluding remarks

It is determined that the fundamental changes in the system of financial monitoring are the development of mechanisms for improving the risk-oriented approach applied to report entities of the primary financial monitoring and aimed at carrying out risk analysis and

classification. The offered methodical study of assessment of the probability of relatedness of insurance companies based on the use of tools of graph theory and indicators-markers for assessment of the probability of markers relatedness of insurance companies (assets, equity and insurance reserves, insurance premiums and insurance premiums owed to reinsurers).

For testing systems technologies (based on the use of indicators-markers) to assess the probability of relatedness of insurance companies and determining its impact on the risk of money laundering, it has been used data from the financial statements of 15 Ukrainian insurance companies for 2006-2017 years that served as the statistical base. This made it possible to identify the relatedness of insurance companies, which would improve the risk-oriented approach to insurance companies, which are the reporting entities of the initial financial monitoring.

An empirical test of the use of the indicator-marker ''equity'' was used to determine the correlation coefficients that characterize the tightness of relatedness of the investigated insurance companies, as well as the determination of the coefficients for building the insurance companies' relatedness graphs. Selection is of closely connected insurance companies was held based on building a two-dimensional binary matrix. At this stage for the further research, there have been highlighted the closely connected insurance companies, for which the module correlation coefficient greater than 0.7, and loosely connected insurance companies, which module of the correlation coefficient is less than 0.7. The next step defines the importance of relatedness for the insurer's indicator marker. To investigate the relatedness the graph theory has been used. The graphs construction was carried out using a Graphoanalizer program, which is an environment for the visualization of graphs and provides the ability to create and manipulate graphs to visually display the results of the algorithms. The environment supports the work with oriented and simple graphs, loaded and unloaded. As a result,it has been determined that for indicator-marker "equity" the level of relatedness is one third that needs to develop and improve measures for risk assessment "laundering" of funds by the insurance companies which get to their list of connected insurance companies. The average share of insurance companies with direct connections with high connection tightness is 53.33%, while the incoherent coefficient is 46.67%. The lower value for this indicator is for the insurance companies with the reverse connections are 40%, i.e.in the research group of insurance companies with direct relationships are dominant.

Thus, to establish entities with a common economic risk to be involved in money laundering, the necessity of determining the level of relatedness between insurance companies was justified. The proposed tool will enable to improve the risk assessment of possible involvement by insurance companies in money laundering in the financial services market, to provide a plurality of independent insurers, to prove the influence of one insurance company to another that will facilitate prevention of the risk of connected financial institutions' impact on the ability to create a network for money laundering.

Hence, the results of the evaluation of insurance companies' relatedness recommended to be used as an element of a methodological approach to assess the potential risk of money laundering based on the definition of insurance companies' relatedness. The issue of

improvement of state regulation of financial monitoring that requires a network discovery tools aimed at AML / CFT based on the offered indicators-markers is the subject of further research.

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DOES FINANCIAL AND ECONOMIC FACTORS INFLUENCE FIRM VALUE OF LISTED COMPANY IN TEHRAN STOCK EXCHANGE (TSE)?

This paper would clearly reflect the need for the development of the individual indicators which allow the proper presentation of the analytical activity of the enterprises operating in the industrial sector of the economy. Therefore, we investigate and rank factors of economic, financial and accounting affecting the firm value of listed companies in Tehran Stock Exchange by using on Analytic Hierarchy Process (AHP) method. The data sample was selected five companies among ten active industries sector of the economy in the Tehran Stock Exchange from 2009 to 2015. The purpose of this research is to identify and rank economic and accounting factors affecting the value of firms with the use of multi-criteria decision-making techniques. In the first stage, the pooled OLS estimator was used to estimate the conceptual model and find significant factors include inflation, interest rate, liquidity growth rate, customer price index (CPI), profit sustainability, firm size, profitability, financial leverage affects firm value. In the second stage, the Analytic Hierarchy Process (AHP) was applied to rank the most effective factors on firm value.
The empirical results show all listed variables had a significant impact on firm value in the stock market except the interest rates. By using the AHP method, inflation and liquidity growth as macroeconomic variables, and profit sustainability and growth opportunities as financial variables, were most affective factors influence on the Firm value orderly.
JEL: G32; G11; D22; D81

1. Introduction

By development of industry and technology, most industrial companies are planning to expand their main activities in other fields. The motivation for such development mostly is increasing the profitability as well as increasing the interests of shareholders. In this case, the creation of a suitable environment for healthy and productive investments, the

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advancement of companies and the strengthening of the capital market are among the most important steps that have to be taken. Since the goal of investors is earning income from the stock market and increasing wealth, one of the ways of increasing wealth is the growth of firm share values. Therefore, this is necessary to gathering information to help them for evaluating the activities and capabilities of business units and selection of the intended company, which lead to intelligent investment.

Determining the company's value and identifying its effective factors in capital markets has always been a challenging topic for investors and financial analysts. They have sought to identify the factors affecting the company's value, so they can determine the actual value of the company by controlling these factors. As a result, the value of the company's market is closer to its actual value. Therefore, the importance of determining the value of company and factors affecting it is identified, so estimating the future value of companies has been always one of the investor concerns.

Investment decisions are made based on information provided in a variety of ways to the capital market. The most important source of information for investor's decision and creditors is financial statements. Each rational decision-maker does an investment in order to earn and maximize the stock return. Therefore, the stock return is the key element which is affecting the decisions of share's investor.

Market-based research, which is a branch of accounting, examines the relationship between financial information and company value. The stock price reflects the fundamental information which are previously were planned. One of the most important decisions which is made by the empirical financial accounting researchers from Ball and Brown's research was to identify and justify the market reactions against the related information to profit. On the other hand, management has significant authorities in choice of different methods to take account of financial events within the framework of accepted accounting principles. By choosing an appropriate basis, more relevant and useful studies can be gathered and the company value can be measured more realistically.

The methods and techniques presented in the challenge of financial management and investment texts for share valuation are only applicable as a theoretical framework and cannot alone reflect the true value of a company (human resources accounting).

In the finance literature, the value of an asset with the current value of future cash flows from its asset is equal. Actual value of ordinary stocks is also calculated from the reduction of future cash flows. The cash flows of stocks include dividend profit and stock sale prices. Government policies, inflation, performance, and potential capabilities of industry and company have a significant impact on the demand behaviour of investors both in primary markets and in secondary markets. These factors can be studied from the microeconomics and macroeconomics point of view (Russell et al., 2015).

The use of powerful techniques and tools, such as the Analytical Hierarchy Process (AHP), can be helpful. The AHP was raised in 1980, as a tool for wide analysis in the modelling of issues such as political, economical, social and educational sciences and sport management subjects and was initiated based on a pair comparison from cluster values of subjects. The Analytical Hierarchy Process (AHP) is used as an effective technology to determine the

optimal location of installation establishment through multi-criteria indicators, and specifies the subjective ratio and value of the parameters in multi-subject issues (Kivett, 2016).

Previous research was limited to the relationship between financial statement items and their correlation to the company's value. The hidden effects of economic elements such as inflation, interest rate, and intensity of supply and demand were ignored, so it leads to remain hidden the different dimensions of the company's value.

The purpose of this research is to identify and rank economic and accounting factors affecting the value of firms by applying multi-criteria decision-making techniques. This research investigates to find out the economical, financial, and accounting factors that are affecting on the company's value, and specify the relative importance of each factor in different groups according to the purpose of the research. Finally, how is the identification and ranking of each of these factors with respect to the relative importance of them? According to discussed issues, the research study on identifying and ranking the economic, financial and accounting factors which are affecting the value of companies was listed in Tehran stock exchange based on the AHP method.

The purpose of this paper is to identify and rank economic and accounting factors affecting the value of firms with the use of multi-criteria decision-making techniques. The research paper has a technical-applied paper and clearly reflects the need for the development of the individual indicators that allow the proper presentation of the analytical activity of enterprises operating in the industrial sector of the Iranian economy.

2. Literature Review

Hosseini (2015) analyzed factors were affecting the value of companies in the Tehran Stock Exchange. The research shows that investing in the capital market requires decision making, which itself requires obtaining information about the future situation of the share price. During the past years, the privatization of governmental enterprises has been specially considered. Currently, the authorities are trying to transfer ownership of governmental firms and companies to the private sector. The advocates of this approach believe that transfer of ownership to the private sector will lead to have growth in efficiency and value of companies, increasing in production and the business environment, and ultimately to economic growth. On the other hand, stock market activists, owners and shareholders of companies, examine corporate profits process to select their investment policy of buying and selling. The analysis and evaluation of ownership structure and value of active companies in Tehran Stock Exchange have been reviewed. The results indicate a significant relationship between ownership structure and company value. In addition, the ownership has a direct effect on stock efficiency of the companies in the stock market.

Bagher Beigi and Pourali (2013) investigated the relationship between financial flexibility with growth opportunities and future value of listed companies to the Tehran Stock Exchange. The results show that there is no significant relationship between financial firm flexibility and firm's size and profitability of companies with growth opportunities of companies. In addition, there is not a significant relationship between corporate financial flexibility and profitability of companies with future corporate value.

Khansari (2013) analyzed factors are affected on the value of the company are listed in Tehran Stock Exchange. The results show that is no significant relationship between ratios of undistributed profit to dividend profits, the ratio of debt to total assets, growth of capital expenditures with the value of the company. It can also be concluding that the dividend's impact on the value of the company in the high Return on Equity (ROE) is not less than of companies with low.

Russell et al. (2015) examined the determinants of stock prices in Nigeria. In this research, they concluded four factors affect share prices: the interest of each stock, Gross Domestic Product (GDP), loan's interest rate and exchange rates. Model show there was a negative relation between loan's interest rate and exchange rate with share price and there was a positive relation between share profit, dividend profit of share and gross domestic product (GDP) with the share price.

Abvvafya and Chambers (2015) investigated the relationship between monetary policy, exchange rate and share price in the Middle East. They surveyed the countries of Kuwait, Saudi Arabia, Egypt, Jordan, and Oman as the sample of Middle Eastern countries. Limitations were considered to identify short-term and long-term structural shocks. The results indicated there was a difference in the monetary policy framework and characteristics of the stock market in the Middle East. Fundamentally, monetary policy shocks and the real exchange rate had a short-term effect on share prices in countries with independent monetary policies and flexible exchange rate.

Kroes and Manikas (2014) examined the relationship between cash flow management and financial performance of USA firms. The results indicated cash flow was not related to company financial performance, but the operating cash flow had a significant relationship with the Tobin's Q ratio. It should be noted decreasing in receivable accounts and inventory of goods and materials had a significant relationship with improving financial performance.

Bshkveh and Afshari (2012) by using the Analytic Hierarchy Process (AHP), assess the factors affecting the stock market. The results show share price, share's dividend profit, company management, operating profit ratio, technology, Price-to-Earnings (P/E) ratio, firm size, economic benefit and systematic risk had a higher rate and weight than other variables in influencing the stock market.

Russell et al. (2009) investigated the effect of accumulated profits (microeconomics factors), inflation and interest rate (macroeconomic factors) on stock prices in the Kuwaiti Stock Exchange. They found that macroeconomic factors had a strong negative impact on share prices.

We focus on comparing public enterprise efficiency of Iran stock market, while conducting a study of the theoretical basis of enterprise performance and efficiency, factors which influence them, choosing how to conduct comprehensive economic and financial analysis. We use the hierarchical process method, who has the capability to integrate with research methods into operations, also provide the fields of development and its application in various fields of engineering sciences. Multi-criteria decision-making methods can also improve processes such as agency valuation, thereby reducing the error rate, providing information, solutions, and appropriate options to managers and decision-makers. The

effect of economic variables on the capital market is the most important subject of financial theories.

Finally, in this paper, these two Research questions try to answer.

1. What are the economic, financial, and accounting factors that are affecting the value of listed companies in Tehran Stock Exchange?

2. How is the ranking of economic, financial and accounting factors, which are affecting the value of listed companies in Tehran Stock Exchange?

3. Research Methods

Mathematical (quantitative and non-judgmental) methods and Analytical Hierarchy Process (AHP) are applied in current research. The selection of criteria is the first part of this analysis. Then, the candidates are evaluated based on the identified criteria. The term of alternative or "candidates" is the meaning of this term and can be used instead of each other. In this study, by examining the financial variables, first their effects were examined, and then based on the philosophy of the hierarchical method, acted to rank them.

Therefore, in terms of the purpose of the research, this research focuses on theories, rules, principles, and techniques, which are determined in basic research to solve real and actual problems. In general, the main motivation for the research is, seeking the truth and access to new information and relationships that help to get a deeper understanding about the phenomena.

The research method is descriptive and the focus of researcher attention is on the existing conditions or relationships, common beliefs, current processes, evident effects, or growing trends. Finally, the research type of the present study is a post-event approach (through past information).

The conceptual model of the research is based on Ronaghi et al. (2015), which is shown below in the form of relation (1).

$$Firm\ Value = \alpha + \beta_1\ ln(R)_{it} + \beta_2 RCG_{it} + \beta_3 CPI_{it} + \beta_4 SP_{it} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 LEV_{it} + \beta_8 Q2btn_{it} + \beta_9 Int_{it} + \varepsilon$$

In this Table, the research variables are expressed.

The research sample includes listed-companies in Tehran Stock Exchange by following requirements:

1. The stocks of the company have been traded in Tehran Stock Exchange (TSE) since 2010 to 2015, because the period includes the years of before and after this interval and should not be devoted to research variables.

2. The stock symbol of the company is active and traded at least once a year.

3. The financial information of the company is available in the course of the study.

4. Because of homogenization, the research sample has not been part of the financial intermediary firms' cluster.

5. Finally, five companies from the sub-category of industries with the highest market value were considered research sample.

In this research, for determining sample size, five companies from each industry were selected from the ten active industries in the Tehran Stock Exchange. Eventually, 300 companies were investigated during 6-years period between 2010 and 2015.

Table 1

Research variables definition

Variables	Symbol	Definition	Type
Firm value	Firm Value	Market value of stockholders rights over book value of stockholders rights	dependent
Inflation	In(R)	Inflation, according to the released list by the Bureau of Economic Statistics of the Central Bank of the Islamic Republic of Iran, the inflation rates will be announced each year at the end of May	independent
Liquidity growth rate	RCG	Current operational cash flow mines last year operational cash flow over last year operational cash flow	independent
Rate of the total price of goods and services	CPI	Customer price index of goods and services; according to the released list by the Bureau of Economic Statistics of the Central Bank of the Islamic Republic of Iran	independent
Profit sustainability	SP	Profit sustainability, this index measures the continuity and sustainability of profit from one period to next, and was estimated through the current period profit to profit of next period.	independent
Firm size	SIZE	Logarithm of the book value of total assets	independent
Profitability	ROA	The total return of assets was accounted by dividing net profit to total assets of the period	independent
Financial Leverage	LEV	Divide each company's debt into total assets	independent
Firm growth	Q2bin	The ratio of Q-Tobin was calculated based on the total market value of equity of stockholders and total debt of the company divided by total assets	independent
Interest rate	INT	Interest rate; was used the ratio of financial cost to net profit of company for each year	independent

Source: Research finding

4. Empirical Results and Discussion

Research findings are expressed in two parts: Descriptive and Inferential Findings.

Descriptive Findings

Table 2 presents descriptive findings.

Table 2

Descriptive Statistics

Variables	mean	median	maximum	minimum	Standard deviation	Skewness	Elongation
Firm value	2.21	1.89	87.07	-44.09	6.08	7.53	138.30
Inflation	0.211	0.185	0.347	0.119	0.088	0426	1.555
Liquidity growth rate	-0.0405	-0.120	130.5	-79.46	11.14	4.20	77.03
Rate of Total price of goods and services	2.024	1.532	5.227	0.8231	1.493	1.491	3.665
Profit sustainability	0.158	0.128	0.785	-0.509	0.166	0.839	5.396
Firm size	6.124	6.034	8.063	4.562	0.707	0.518	3.232
Profitability	0.117	0.0885	0.749	-1.22	0.198	-1.607	16.80
Financial Leverage	0.592	0.592	2.12	0.090	0.249	1.486	9.98
Firm growth	1.548	1.353	6.527	0.527	0.671	2.211	13.02
Interest rate	5.302	0.235	996.6	-20.321	58.21	16.57	282.2

Source: Research finding

According to Table 2, the mean and standard deviation of the company's value is 2.215 and 6.089, with a minimum value of 44.09 and a maximum value of -87.0, respectively. The average and standard deviation of inflation variable are 0.211 and 0.088, with a minimum of 0.119 and a maximum of 0.347, respectively. The average and standard deviation of the Firm size variable respectively are 6.124 and 0.707, with a minimum of 4.562 and the maximum of 8.063. The average and standard deviation of the Firm growth variables are 1.548 and 0.671, with a minimum value of 0.574 and the maximum of 6.527.

Except for variables of liquidity growth and interest rates, standard deviations indicate a slight difference between the data values and indicate a normal distribution of data. In general, according to the values of the above Table, which shows the descriptive information of research variables, it can be concluded that in all variables there is a moderate dispersion that can be deduced from the standard deviation values. In addition, from the distance between mean and middle, one can conclude that variables are symmetrical or not, which all of them have relative symmetry. Also, according to the value of the skewness parameter, it can be claimed that the skewness tends to the left, and with respect to the stretch values. It can be argued that the research data curve is elongated, so that the normal curve is, a bit thinner and taller than its normal state.

The F Limer Test

The F Limer test was used to select between panel data and pool data estimation methods. In the F-Limer test, the H0 hypothesis is that intercept is similarity (pool data by pooled OLS) is placed in contrast to the opposite hypothesis of H1, the intercept is un-similarity

(method of panel data fixed effect). The result of the test shows that the cross-sections are heterogeneous and have individual differences, and panel data methods are more appropriate.

In this research, White's test is used to investigate the existence of heterogeneity of variance problem. Using Fisher's *F- test*, it is easy to judge whether research model is heterogeneous or not, and the significance level of this statistic test is more than 5%, therefore, using Pooled-Ordinary least squares (OLS) method is suitable.

Multicollinearity is a situation that indicates an independent variable has a linear function of other independent variables. If collinearity is high in a regression equation, it means that there is a high correlation between the independent variables and may not be highly valid despite the R^2 being high. In other words, the model looks good; it does not have significant independent variables. In the case of collinearity verification, there is a set of problems in determining the accuracy of the regression equation. The collinearity test of the research variables is described in Table 3.

The data of status indicators are less than 10, and these values are considered among the acceptable values. Therefore, it can be concluded that the co-linearity problem is not observed between independent variables.

Table 3

Collinearity test

Variables	VIF
Inflation rate	1.27
Liquidity growth rate	1.03
CPI	1.26
Profit sustainability	2.74
Firm size	1.29
Profitability	2.39
Financial leverage	1.37
Firm growth	1.24
Interest rate	1.009

Source: Research finding

The goal of this research hypothesis is to examine the issue that if there is a significant relationship between the Tehran Stock Exchange between macroeconomic, financial and accounting factors on the value of listed companies or not. The model estimation is presented in Table 4.

The significance level of the *F- statistic* is less than the error level of the test ($\alpha = 0.05$) and therefore the hypothesis of H0 is rejected means that "the regression model is not meaningful", and the estimated model is statistically significant and therefore the relationships between the variables of the research are linear. In this study, the amount of adjusted coefficient of determination is estimated at 43%, which expresses a significant contribution of changes in the dependent variable by the independent variables of this research.

Table 4

Model estimation

Variables	symbol	Coefficients	standard error	t-statistics	Significant level
Intercept	C	0.870	0.059	14.7	0.00
Inflation rate	In_R	2.301	0.432	5.32	0.00
Liquidity growth rate	RCG	1.554	0.189	8.204	0.00
Rate of the total price of goods and services	CPI	0.112	0.019	5.72	0.00
Profit sustainability	SP	0.270	0.036	7.537	0.00
Firm size	SIZE	-0.405	0.088	-4.60	0.00
Profitability	ROA	-0.606	0.121	-4.98	0.00
Financial leverage	LEV	-0.265	0.069	-3.48	0.00
opportunity growth	Q2bin	0.154	0.046	3.312	0.00
Interest rate	It_R	0.154	0.094	1.640	0.00
F Statistics		37.6380 0.000	Durbin-Watson Statistics		2.296
R^2		0.439	Adjusted R^2		0.427

Source: Research finding

The general results from the statistical tests of the research according to the results of Table 4 can be commented to identify the economic, financial and accounting factors that are affecting the company's value as follows. There is a positive and significant relationship between the variables of inflation, liquidity growth, price index of goods and services, the sustainability of profit and opportunity of growth with the value of the company as a dependent variable in the research.

Watson's statistics in each of the hypothesis tests, indicating the Self-correlation test among the research variables. Since this statistic is 2.297 and the value is between the ranges of 1.5 to 2.5, so there is no problem of self-correlation between the research variables.

This is despite the fact that there is an inverse but significant relationship between the variables of size, profitability and financial leverage with the value of the company. In summary, the first goal of this study was realized. In order to investigate the second goal of the research, the following measures are implemented, which, according to the Analytic Hierarchy Process (AHP), results are summarized in Table 5.

Based on the obtained amount of coefficients from the research variables, the ranking operation of the affective variables on the company's value has been done. Inflation variable was recognized as the most effective variable and profitability variable was recognized as the least effective variable. Therefore, the first goal been achieved, the second goal of the study was also achieved.

The chosen approaches to analysis are presented and justified and they are quite similar to the composition of the groups of parameters that describe the results of the working companies, that will characterize the overall performance of enterprises as a complex socio-economic system.

Table 5

Summary of Finding

No.	Dependent Variable	Independent Variables	Coefficients	Possibility	Result
1		Inflation rate	2.301	0.001	Positive and Significant relationship
2		Liquidity growth rate	1.554	0.001	Positive and Significant relationship
3		Profit sustainability	0.270	0.001	Positive and Significant relationship
4		Opportunity growth	0.154	0.001	Positive and Significant relationship
5	Firm value	CPI	0.112	0.001	Positive and Significant relationship
6		Financial Leverage	-0.265	0.001	Negative and Significant relationship
7		Firm size	-0.405	0.001	Negative and Significant relationship
8		Profitability	-0.606	0.001	Negative and Significant relationship

Source: Research finding

According to the results of the research, it is suggested that investors focus on the growth opportunities of the company as a long-term tool, and to devote more of their attention to the investments of the company. Regarding liquidity status, as a flexible arm of the company, it is suggested to creditors and investors to pay more attention to this factor as an internal financing method. Regarding the index of inflation and the price index of goods and services, it is also suggested that analysts pay more attention to the role of this factor at the time of the announcement of profit.

With regard to the profit sustainability variable, companies which have appropriate profit sustainability may attract more attention from investors. This attention will attract the capital and, consequently, increase the value of the company. Therefore, the study of profit-linked channels can be connected continuously with the sustainability of profit.

The study also created an attempt to systemize and present the main criteria and guidelines for finding the important financial ratios and dependencies and on their basis to form a basic methodology for correctly assessing the efficiency of the enterprise's operation and identifying the obstacles in their work.

5. Conclusion and Policy Suggestions

The environment in which companies work is a growing and highly competitive environment. Companies should compete with many factors at the national and international levels and expand their activities through new investment to survive.

Companies need financial resources to invest, but financial resources and their use should be well defined so that the company can be profitable. The financial director must be careful that the financing method is compatible with the company's investment type and also use the leverage to a reasonable degree to maximize the company's value (Moradi et al., 2014).

Determining the value of a company and identifying its effective factors in capital markets has always been a challenging topic for investors and financial analysts. Estimating the future value of companies has always been one of the concerns of investors and in this way, different financial instruments have been used (Valpipour et al., 2010). The techniques and methods which are presented in the doctrines of financial management and investment texts for stock assessment are only applicable as a theoretical framework and cannot be used alone to represent the true value of a company (Ghalibaf and Mazaheri, 2005).

In this paper, AHP was used because are not limited to a specific field and can be developed as one of the most effective methods of industrial engineering in different branches of other engineering sciences. From a theoretical point of view, the hierarchical process method has the capability to integrate with research methods into operations, also provide the fields of development and its application in various fields of engineering sciences. Multi-criteria decision-making methods can also improve processes such as agency valuation, thereby reducing the error rate, providing information, solutions, and appropriate options to managers and decision-makers.

The effect of economic variables on the capital market is the most important subject of financial theories. News related to the economic variables can make important changes in investor expectations and even lead to seasonal behaviors in stock markets (Vakilifard and Alifari, 2015).

In order to secure the market for attracting more funds, the macro factors which are affecting investments including economic, political, socio-cultural and technological should be investigated and with a precise drawing of risks and possible outputs, appropriate decisions are made by major and minor investors. According to the presentations and considering that the capital market is in addition to the money market forming the financial markets, so that it has followed that as part of the economy, and if there is no logical relationship with other sectors, there is possibility to there are problems and shortcomings in their mechanism (Darabi and Farahi, 2010). With the knowledge of the mentioned contents, the following is commented on the conformation of the results of this research with earlier studies:

Regarding the inflation variable, the result of this research is compatible with the Peiro research (2015), but it is incompatible with the research of the Valijan (2013), Bahram Moghaddam and Kovarouyi (2012), Rahnama Roodpashti and Amir Hosseini (2010), Sajadi, et al. (2010), Rezaei (2011), Darabi, and Alifari (2010) are incompatible.

Valijan (2013) claims that by comparing the rate of bank interest with inflation, the real interest rate is negative, and this factor leads to a decrease in value, and resources lead to dealership issues and Intermediation (Valijan, 2013). The result of this the research on

commodity and service price index is inappropriate with Valijan (2013) research. He said that with the increase in the general level of prices, the market faces a shortage of funds; therefore, the tendency to invest decreases more than other times. In his opinion, the relationship of this element with the company value is inverse (Valijan, 2013). About the variable of liquidity growth, the result of this research is compatible with the Valijan (2013) research, but it is incompatible with Sajadi et al. (2010). The result of this research is compatible with the profit sustainability variable, by Khalilzadeh et al. (2013). The result of this study about the growth opportunity variable is compatible with Sinaee and other's research. The result of this research regarding the financial leverage variable, with Sinaee et al. (2011) research, is incompatible. The result of this study about the variable of the company size with Pourzamani and Kharidar (2013) is incompatible. The result of this research regarding the profitability variable is compatible with the research by Alamshahi et al. (2015).

According to the results of the research, it is suggested that investors focus on the growth opportunities of the company as a long-term tool, and to devote more of their attention to the investments of the company. Regarding liquidity status, as a flexible arm of the company, it is suggested to creditors and investors to pay more attention to this factor as an internal financing method. Regarding the index of inflation and the price index of goods and services, it is also suggested that analysts pay more attention to the role of this factor at the time of the announcement of profit. Because the level of dividends and the type of behaviour of shareholders in the context of increasing the general level of prices may indicate a different behaviour of them.

In order to assess the short-term ability of the business unit, cash flows, in addition to internal financing, it reduces the agency's problems to expand company activities. Therefore, it is suggested to investors to consider the elements of current classes, means working capital.

Also, with regard to the profit sustainability variable, companies which have an appropriate profit sustainability may attract more attention from investors. This attention will attract the capital and, consequently, increase the value of the company. Therefore, the study of profit-linked channels can be connected continuously with the sustainability of profit.

In all companies, one of the promoter factors of the research work is the availability of abundant, on time and available information resources, which there is this limitation on access to information. But in developing countries, due to the lack of integrated information centres, the inability to use the power of the computer in the vast size and the fear of disclosing information has prevented the flow of information from resources towards researchers and research centres. In our country, there are also these limitations on access to information. Here are some of the specific limitations of this research:

1. According to the characteristics of the sample members of the research, the passage of results to all bourse companies should be done with caution.

2. As provided financial statements based on historical have been used to calculate the research variables, when using a combination of financial statement information with

macroeconomic indicators, it can be obtained different results separately from these findings.

3. Research time period.

4. There are other interfering factors that may affect financial performance (boycott, macroeconomic variables, and liquidity conditions), but their effect in this research has not been monitored.

5. Different users' knowledge levels of research results.

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SUMMARIES

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OPPORTUNITIES AND PROSPECTS FOR JAPAN'S INVESTMENTS IN BULGARIA

This expert report has been prepared by Economic Research Institute at the Bulgarian Academy of Sciences, in connection with the initiative of the President of the Republic and the Embassy of Japan for a Bulgaria-Japan Business Meeting on February 5th, 2020. It presents an analysis and assessment of the opportunities and prospects for Japan's investments in Bulgaria, in particular:

- Main trends in Japan's investments in the EU Member States from Central and South-Eastern Europe (CSEE) are studied and outlined to identify the specifics of Japan's investments abroad by countries, sectors, productions, forms, in which they invest. In this way, a targeted approach is introduced, tailored to the specifics of these investments.
- A historical overview is presented – the successes of trade and economic cooperation in the area of investments, in order to outline how the good practices and experiences in the past would support future investments from Japan in Bulgaria.
- A critical review of the comparative advantages of investing in Bulgaria is presented along with an identification of those, that are important to Japanese investors.
- Studied is the current European regulatory framework for foreign investments in order to identify the opportunities and policies that could support Japanese investors in Bulgaria as an EU Member State.
- Outlined are important strategic priorities of the Bulgarian economy in regard to the development of innovations, information technologies and green economy, in order to direct the interest of Japanese investors towards them.
- Identified are the opportunities for using the local raw materials through Japanese investments in Bulgaria, as well as the potential for waste processing and circular economy.
- Determined are sectors and productions where the capacity and interest of the Japanese investors coincide with the opportunities and advantages of the Bulgarian economy.
- Identified are economic sectors and productions of mutual interest to Japanese investors and Bulgarian business.

Attracting investments from Japan would have a significant national economic effect in implementing the strategic long-term priorities of the country. For the Bulgarian business, this would expand the economic space to high technologies and partnerships with Japanese companies and the access of Bulgarian goods to the Japanese market. For the Japanese economy and investors, expanding the economic space to Bulgaria would have a strong positive effect, including increasing their presence on the EU markets.
JEL: O23; O24; O25; O53

Rossitsa Rangelova

ETHICAL INFRASTRUCTURE IN THE POST-SOCIALIST BULGARIA

The article analyzes the emergence and development of business ethics in Bulgaria from 1989 to the present day, that is, it traces the emergence of ethical infrastructure in the conditions of transition from a centrally planned to a market economy and its development already in the conditions of the country's membership in the EU. The period of the last 30 years is divided into three sub-periods: (a) the collapse of state socialism and the launching of a market economy and democratic principles (1989-1997); (b) the period of deeper structural reforms and the preparation of the economy for EU accession (1997-2007); (c) the years of Bulgaria's EU membership (since 2007 up to now). The research deals with main problems of building ethical infrastructure – at the beginning of the period the ownership change – restitution, privatization, etc., and later on – legislation, freedom of speech, shadow economy, corruption and more are studied. The issues discussed herein are complemented by the results of the surveys conducted in 1996 and 2019. The questions of established business ethics in Bulgaria are posed in the context of the challenges facing the society of this still transforming country.
JEL: H11; J38; J68; P16

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INSTITUTIONAL TRANSMISSION IN ECONOMIC DEVELOPMENT

The main objective of this study is to provide a theoretical and empirical framework for analyzing the relationship between economic growth and the property rights institute in different countries. The key idea is that property rights are multifarious and can be classified according to their role in economic development. These days it is the intellectual property rights that impact the economic development through propensity to innovate. However, the protection of intellectual property rights does matter for economic growth only in a well-developed political and legal environment. We find that economic performance in highly developed countries is to a greater extent contingent upon a quality of the protection of intellectual property rights than in less developed economies. This finding raises an important question about the credibility of the preponderant approach based on a simple unification of countries with a different institutional framework under one umbrella when their effects on growth. Such an approach may provide inconsistent and misleading results and lead to false conclusions and wrong policies.
JEL: B52; E02; K11

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MARKETING COMMUNICATION PRACTICES IN BULGARIAN HIGHER EDUCATION

This study presents the results from the second end-stage of a project on the topic of "Marketing Communication and Developing Competitive Advantages in Higher Education", financed by the "Scientific Research" fund at Plovdiv University "Paisii Hilendarski" for the period 2017-2018. **The main goal** of the conducted empirical research is describing and comparing communication practices and activities by the Bulgarian state higher schools and universities in relation to their target groups – candidate students, current students and employers. **The object** of study are the public higher schools and universities operating on the territory of the Republic of Bulgaria. **The subject** of study is the

marketing communication as a factor in building competitive advantages by Bulgarian higher schools and universities. Questionnaires were prepared and distributed online among experts in the statistical units in order to solve the posed research problems. Among the significant conclusions derived from the results are that surprisingly larger high schools rarely have their written communication strategy and medium and smaller ones seem to be more engaged with active strategic marketing communication planning; only 1/3 of higher schools are trying to track and evaluate the impact of marketing communication in changing their reputation what should be one of their long-term communication goals if planned effectively.
JEL: M31; L22

Olha Kravchenko

SCENARIO ANALYSIS OF THE ASSESSMENT OF THE RAIL TRANSPORT IMPACT ON THE ECONOMIC GROWTH (ON THE EXAMPLE OF UKRAINE)

In the modern world, efficient transport infrastructure is one of the main factors ensuring economic growth in both countries and macro-regions. In this context, of particular interest are studies in states whose economies are in a state of crisis and are characterized by a high uncertainty of development parameters. To this aim, the influence of the rail transport on the economy of Ukraine was studied. The importance of Ukrainian railways in the system of international transport and communication links between the countries of Eurasia is considered. The use of scenario simulation to study the prospects for the development of the rail transport in conditions of high uncertainty has been substantiated. A SWOT analysis was performed, based on the results of which scenarios were constructed for rail transport in Ukraine. Scenario analysis showed that in the context of a systemic economic crisis, the rail transport can influence not the process of economic growth in the country, but its intensity, acting as a factor of acceleration or deceleration. Improvement of the situation is possible when developing a set of measures aimed primarily at improving the internal environment of rail transport.
JEL: C51; L92; R11

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DEMYSTIFYING THE FACTORS CONTRIBUTING TO SUCCESSFUL PROCESS INNOVATIONS IN THE CZECH AUTOMOTIVE INDUSTRIES

There is a need for firms to know the factors driving their process innovation. Knowledge of these determinants will help firms to withstand the tough market competitions from their rivals leading to growth and increased productivity. The purpose of this paper is to examine the determinants probable to influence firms process innovations. We focused on the automobile industries in the Czech Republic using data from the Eurostat Community Innovations Survey (CIS) conducted between 2012-2014 and the Structural Equation Model. Our results have shown that the main driving factors probable to contribute to process innovation in these industries were innovation expenditures, collaborations with different partners, engaging in research and development and innovation financial support. Contrary to the literature, we found out that firm's competition in international markets didn't have any influence on their process innovations. Practical implications are also provided for policymakers and management of these industries.
JEL: L62; 030; 031

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INDICATORS-MARKERS FOR ASSESSMENT OF PROBABILITY OF INSURANCE COMPANIES RELATEDNESS IN IMPLEMENTATION OF RISK-ORIENTED APPROACH

The article identifies that a fundamental change in the financial monitoring system is the development of mechanisms to improve the risk-oriented approach that is applied at the national level to the reporting entities of the primary financial monitoring and aimed at carrying out risk analysis and classification. Methodical study of assessment of the probability of relatedness of insurance companies based on the use of tools of graph theory and indicators-markers for assessment of the probability of relatedness of insurance companies. The indicators-markers include: assets, equity and insurance reserves, insurance premiums and insurance premiums owed to reinsurers. For testing systems technologies (based on the use of indicators-markers) to assess the probability of relatedness of insurance companies and determining its impact on the risk of money laundering, it has been used data from the financial statements of 15 Ukrainian insurance companies for 2006-2017 years that served as the statistical base. This made it possible to identify the relatedness of insurance companies, which would improve the risk-oriented approach to insurance companies, which are the reporting entities of the initial financial monitoring. An empirical test of the use of the indicator-marker "equity" was used to determine the correlation coefficients that characterize the tightness of relatedness of the investigated insurance companies, as well as the determination of the coefficients for building the insurance companies' relatedness graphs.
JEL: C53, G17, G21

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Iran Ebrahimi

DOES FINANCIAL AND ECONOMIC FACTORS INFLUENCE FIRM VALUE OF LISTED COMPANY IN TEHRAN STOCK EXCHANGE (TSE)?

This paper would clearly reflect the need for the development of the individual indicators which allow the proper presentation of the analytical activity of the enterprises operating in the industrial sector of the economy. Therefore, we investigate and rank factors of economic, financial and accounting affecting the firm value of listed companies in Tehran Stock Exchange by using on Analytic Hierarchy Process (AHP) method. The data sample was selected five companies among ten active industries sector of the economy in the Tehran Stock Exchange from 2009 to 2015. The purpose of this research is to identify and rank economic and accounting factors affecting the value of firms with the use of multi-criteria decision-making techniques. In the first stage, the pooled OLS estimator was used to estimate the conceptual model and find significant factors include inflation, interest rate, liquidity growth rate, customer price index (CPI), profit sustainability, firm size, profitability, financial leverage affects firm value. In the second stage, the Analytic Hierarchy Process (AHP) was applied to rank the most effective factors on firm value.

The empirical results show all listed variables had a significant impact on firm value in the stock market except the interest rates. By using the AHP method, inflation and liquidity growth as macroeconomic variables, and profit sustainability and growth opportunities as financial variables, were most affective factors influence on the Firm value orderly.
JEL: G32; G11; D22; D81