ИНСТИТУТ ЗА ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ НА БЪЛГАРСКАТА АКАДЕМИЯ НА НАУКИТЕ

Икономически Изследвания

ECONOMIC STUDIES

CONTENTS

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THE ENERGY STRATEGY AND ENERGY POLICY OF THE EUROPEAN UNION[3]

Energy integration is considered to play a key role in the successful development of the European Union. It is assumed that purely market-based mechanisms in this sector, according to the neo-liberal model, can secure a constant supply at low prices. This is the basis of the Union's energy policy, launched by the European Commission (EC). The main goal of this paper is to examine the adequacy of this model and the extent to which the energy policy succeeds in achieving its objectives. There is a difficult combination of technological, economic and political factors expressed in the Union's energy mix. In particular, the document examines the gap between neo-liberal free-market postulates and the practices of modern protectionism, assessing the sustainability of the EU's energy strategy and policy, which often avoid taking efficiency into account. Significant attention is paid to the link between energy and national security, as well as the politically justified intervention of the European Commission in energy projects related to energy supplies for the whole Union. Our research is based on statistics for a long period of time, allowing a comparison between stated intentions and achieved results. Our results stress on the direct link between energy, foreign policy and national security. This link, the cause of the unsatisfactory results, casts doubt on the full integration of the industry and contradicts the views of the Commission.
Keywords: energy strategy; energy efficiency; "Green Deal"; European Commission; common energy policy; electricity market; nuclear energy, neoliberal model; protectionism
JEL: F52; Q42

1. Introduction

The issue of the European Union's energy strategy and policy can only be understood in the general context of integration. Integration itself can be analyzed not through the usual integration theories depending on the political situation, but only if it is placed on a solid formal basis. This article analyzes the production and distribution of electricity – with about

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a quarter in the total volume of final energy consumption. (Equal with gas). Consumption of oil fluctuates around a third of the whole.

Figure 1

Energy consumption by fuel, EU-27, 1990-2018, mill. tonnes of oil equivalent
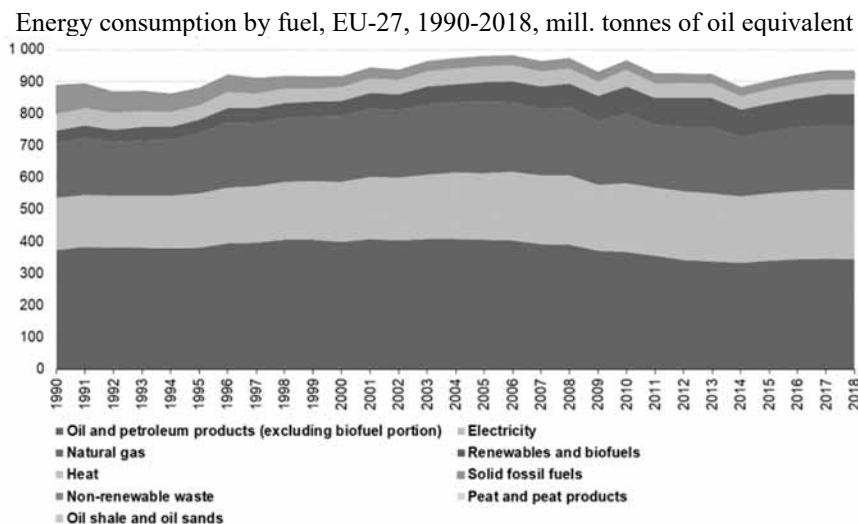
*Source: https://ec.europa.eu/eurostat/statistics-
explained/index.php?title=File:Final_energy_consumption_by_fuel,_EU-27,_1990-
2018_(million_tonnes_of_oil_equivalent).png.*

As the Union's energy strategy "Green Deal", proposed by the European Commission, suggests a total restriction of fossil fuels, there are expected significant and politically motivated changes in these ratios. The consumption of oil should be reduced, while the consumption of gas could increase – both for heating and in electricity generation. The electricity consumption should also increase in transport, while diminishing for heating (The total reduction in consumption by around 25,000 GWh in 2020, according to Eurostat data, is linked to Covid-19 control measures and is likely to be temporary). How this should happen depends heavily on the energy policy of the European Union.

So far, the European Union's attempts at constructing and imposing common energy policy deliver partial results. The aim of building an EU internal energy market is to increase energy efficiency by connecting national and regional electricity transmission networks and to establish common market rules across the EU. The European Commission efforts lead to very slow progress, and resistance comes from key member states, whose sovereignty in the energy field remains largely preserved. The attitude to the production and supply of electricity is special because it affects national security and requires guarantees of continuity of supply while maintaining control. The assumptions that electricity markets may combine high competition with low prices (so far) are not confirmed by practice, both for technical and economic reasons.

As the Commission lacks economic arguments, it seeks ways of administrative and political influence. Sometimes this contradicts the interests of the big Member States. As a result, a solid Union energy strategy is lacking.

1. Methodological Basis – System Approach and Energy

The combination of the General Theory of Systems (Bertalanffy, 1968) with the Theory of Functional Systems (Anokhin, 1971) and Cybernetics (Wiener, 1954) allows for the analysis of European integration as a process of formation of an open system. For the correct understanding of the process are equally important both the exchange between system and environment (including energy) and the efficiency of internal system connections (including energy transfer between system elements.) Synergetics further develops the systematic approach in the dynamic model and allows to determine the moment at which the system performs a phase transition.

Figure 2 includes all the basic concepts applicable to the EU as a system.

Figure 2

Schematic representation of the system
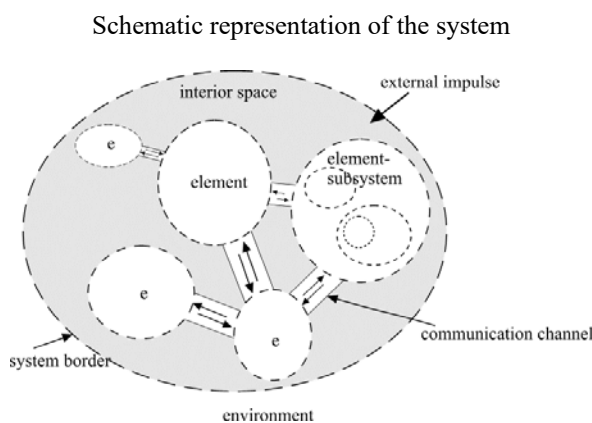
Source: own development.

The most important condition for building and balancing an open system is its energy security. The presence of own energy sources makes the task easier – a minimum amount of energy exchange with the environment requires less border control. The volume of the system can also be important – in accordance with the laws of thermodynamics – increasing the volume reduces the relative energy consumption and increases energy efficiency.

If the equilibrium of an open system is maintained by energy imports, then the main question is to what extent the system is able to effectively control its external sources. The dynamic environment, with frequent abrupt changes, makes this control more difficult. The role of external energy impulses becomes decisive. The logical behaviour of an open system is to strive for energy self-sufficiency. This desired end result is in itself a system-forming factor isomorphic to different classes of systems (according to Anokhin). That is why, in recent years, facing the dynamics of the environment, the EU is trying to develop as an energy independent system. In this situation, the solution of the problem is sought in all possible directions, with deteriorating initial conditions:

1. The union' energy resources are very limited: compared to its competitors, it has the smallest deposits of widely used energy.

2. Besides the EU is socially very heterogeneous. Due to recent rounds of enlargement, the Union is probably too large to be managed effectively. Its management scheme was conceived and implemented under other conditions. The large volume not only brings advantages, as mentioned above, but also imposes limitations, according to Norbert Wiener's (1954, p.158) thesis that *"... The community extends only so far as there extends an effectual transmission of information. .."* The actual transmission without distortion and loss of usefulness, without turning into "noise" or "infinite fluctuations" as defined by Claude Shannon (1948), becomes difficult. Long communication routes in a heterogeneous internal space inevitably cause information losses and impose an upper limit on the effective volume.

Figure 3

Information losses due to lengthening and narrowing of the communication routes, including in a complex/diverse environment
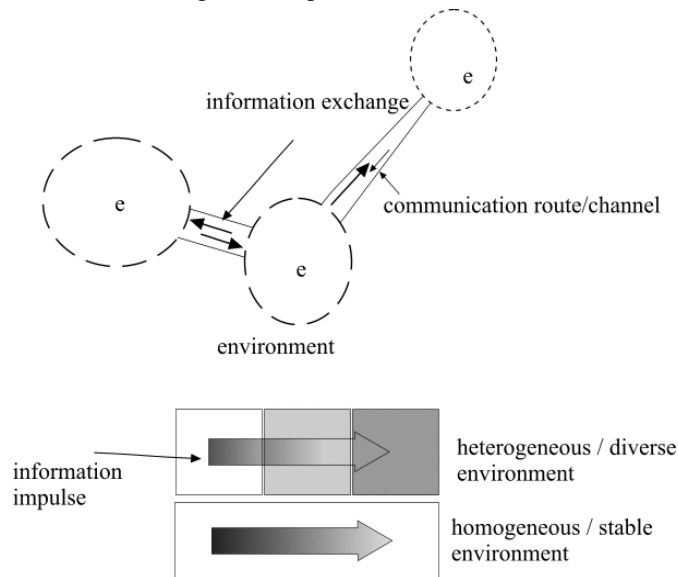
Source: own development.

Such an example gives the loss of electricity during transmission dependent on the length of the electrical conductor (ohmic resistance), discussed below.

But the synergistic analysis of integration, including of the EU energy market model, must be considered in dynamics. The development and use of energy sources depend on the interaction of three groups of factors: technological, economic and political. According to numerous experts, these three groups of factors correspond to the Theory of Long Cycles in Economics (Kondratiev's Waves):

Figure 4

Scheme of Kondratiev cycles -1

Source: https://timreview.ca/article/1327.
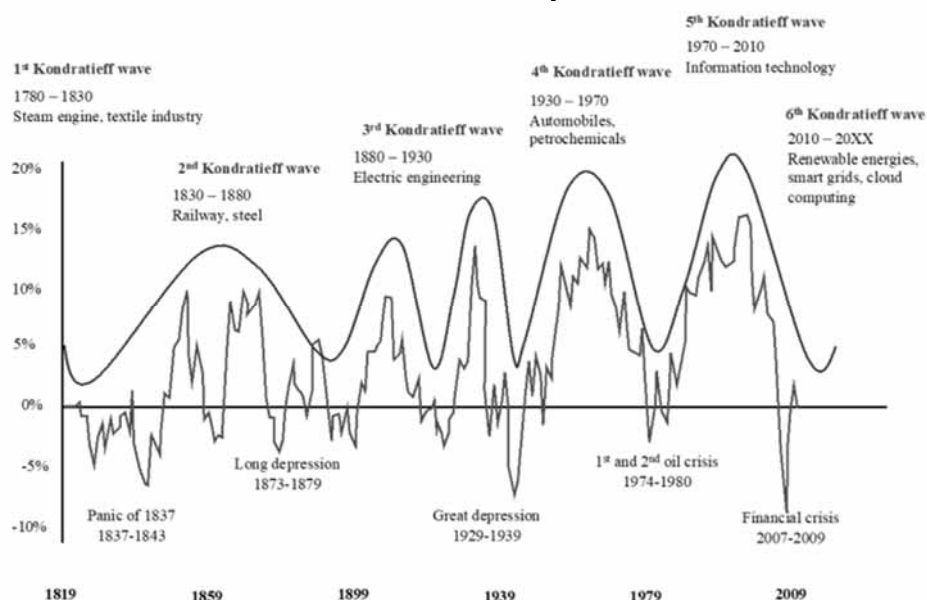
Despite the controversial points in the theory, most scientists acknowledge the existence of several Kondratiev's Waves. These waves fit partially into the distinction "Industry 1.0", "2.0", "3.0" and "4.0", according to Kaletsky. (2011) From the energy point of view, the following can be noted: European integration began during the slowdown of coal as a primary energy source (ECSC). The Community enters then two energy phase transitions – from coal to oil and gas (in the 1960s) and, partially, from oil and gas to nuclear energy. An attempt is currently being observed for a third such phase – from fossil fuels and nuclear energy to renewables (RES).

Technological factors usually play a leading role during such changes. They set a new solution, after which, in the phase of technological maturity, the economic factors take the lead: the new technological solution becomes economically profitable. Finally, political factors set the legal basis of the new energy and deal with the social consequences of abrupt changes. The current transitions meet several requirements at the same time: energy sources must be easily accessible, supply must be secure, energy supply and distribution must be highly efficient.

Failure to meet any of these conditions allows for the search for new technological solutions. In the European Union political factors can suppress the remaining factors. Although it must solve serious economic and social problems, the ECSC is primarily a political project – national control over coal (and steel) must prevent a new arms race superiority and the next war between Germany and its neighbours. The development of nuclear energy in France and

some other countries has been accelerated by the October War and the ensuing oil crisis. Leading fears are connected with the politically unstable Middle East. During the current transition to new energy sources, political considerations again play an important role.

2. Basic Energy Parameters

Energy is the basis of public life, it provides both industrial and household consumption. It must meet several requirements at once, some of which are difficult to reconcile with each other. Energy supplies must be constant in quantity and quality (standard), and the price must be socially acceptable.

The various energy sectors in the EU are intertwined – transport consumes almost a third of the energy in the Union, but only a small part of this consumption is at the expense of the produced electricity. Equally insignificant is the share of electricity for heat production. At the same time, natural gas can be successfully used both for heat production (20% of total gas consumption in Germany) and for electricity production. While the transport and consumption of heat can be currently separated from the production of electricity, the flexibility of gas as an energy carrier has increased its importance in recent years. The mentioned „Green deal" can significantly change the energy mix.

When choosing an energy solution, the above groups of factors are combined in different ways. The leading benchmark is energy efficiency, but this is never enough: in land transport, the actual efficiency of an internal combustion engine measured at the wheels is about 22.5% for a diesel engine and 18% for a gasoline engine (The use of diesel engines in water transport has a higher rate).

The electric cars preferred by environmentalists have an efficiency measured at the wheels between 75 and 85% at power up to 100 KWT. An efficiency of 95% has been announced for the Tesla Model S electric motor, and with the use of a single-speed gearbox, the final wheel efficiency is 94%. To this, however, should be added the calculated efficiency along the entire chain from electricity generation to battery charging of the electric vehicle. The total efficiency of electric trains depends on the efficiency of the electricity producer, reduced by the mechanical losses and the losses on the electric network – in good condition of the network, the efficiency significantly exceeds that of the wheeled transport, including of electric cars.

Coal and other types of fossil fuel plants are still the main producers, but their efficiency is between 33 and 37%. This leads to much lower endpoints, which makes comparison and choice of solution very difficult. Combined cycle gas turbine (CCGT) plants have an efficiency between 40 and 55%, which should keep their place in the total electricity production in the EU until 2050.

Figure 5

Predicted development of EU power generation
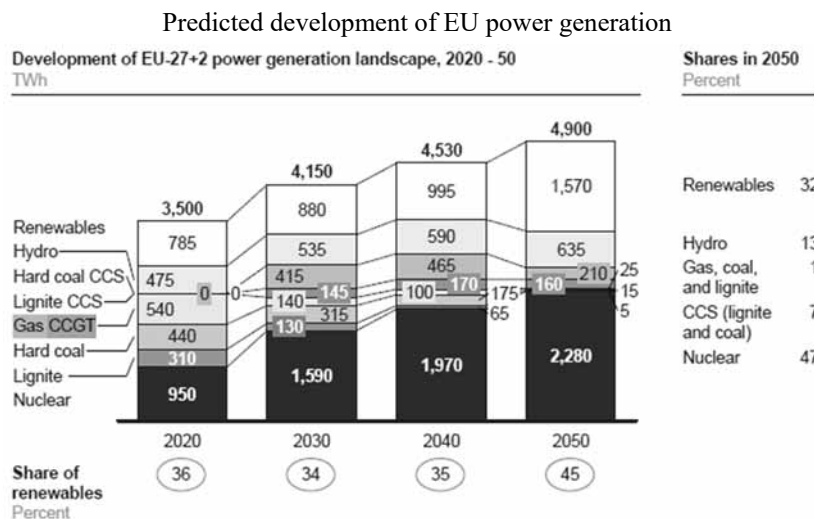
Source: McKinsey & Company, "Transformation of Europe's power system until 2050", 2010.

Between 2011 and 2017, several producers (among them Mitsubishi, General Electric and Siemens AG) claimed to reach 60% and more efficiency, using more advanced technologies.

But high efficiency does not necessarily mean cost reduction if achieved with expensive technologies. Here the technological factors are intervened by the economic ones, which offer other possible solutions. These factors also affect the use of internal combustion engines. Thus, the classic steam engine has an efficiency between 4 and 10%, but the low rate is offset by the abundance and low cost of energy (coal) in the 18th and 19th centuries and the steam engine formed the basis of the First Industrial Revolution. Abundance and low costs of oil prior to the first energy crisis (1973) also justified the use of diesel power plants.

It seems that market pricing provides a more accurate guide when choosing an energy solution, with efficiency remaining only one of the elements included in the efficiency indicator. The common indicator EROI (EROI = Energy Delivered / Energy Required to Deliver that Energy) solves the problem of combining the two groups of factors. The study of D. Weißbach et al. (2013) gives an idea of the biggest problem with alternative energy sources – their low energy efficiency, especially in photovoltaics.

According to their calculations, the "EROI" of solar panels is 4 units, and the "EROI" of wind turbines is 16 units. That is, during its life cycle, solar panels will generate 4 times more energy than was spent on their creation, and wind turbines, respectively, 16 times more energy (average for European countries). Under normal market conditions and constant production, solar panels will pay for themselves in terms of energy for more than six years, and wind farms – for a year and a half. But with renewable energy sources, energy generation depends on natural conditions – wind, light. They require storage systems or power compensators. Thus, due to the introduction of buffer measures, the total "EROI" of solar panels drops to 1.6 units, and the "EROI" of wind farms to 3.9 units.

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Thus, a coal-fired power plant pays for energy in 2 months, and a gas-fired one – only in 9-12 days. However, if energy consumption for coal and gas extraction and transportation is added, then their energy return will be 10 and 11 months, respectively. Hydropower plants pay for energy in 3 years, and nuclear power plants pay for energy in just 2 months (Weißbach et al.).

Wind energy today is the most efficient alternative energy source. However, the low energy coefficient "EROI" cannot maintain the current standard of living in developed countries, which requires a total "EROI" of all energy sources of 25-30 units. Nuclear power plants (NPP) have "EROI" from 85 to 105, depending on the efficiency of uranium enrichment technology, i.e. if the use of RES is necessary at all, then the most profitable is the combination of wind farms with NPPs.

But even this is not enough: in the European Union today, energy production and consumption are intervened for reasons that are not driven by high efficiency. In accordance with the systemic laws mentioned in the first part, self-sufficiency and independence from external supplies are sought, even if this means a higher cost of extracted energy. These considerations are understandable (Figure 6).

Figure 6

EU energy dependence rate
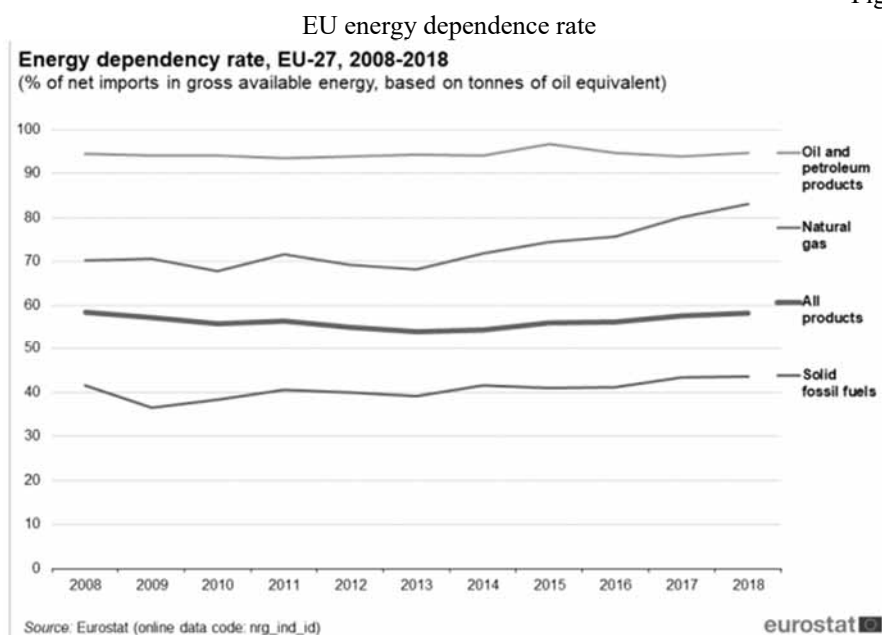
Source: https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_statistics_-_an_overview.

To this are added considerations imposed by the pursuit of high quality of life – a clean and safe environment. The price should be not low, but socially acceptable. But this is already a political issue. Political considerations call for subsidized electricity production from photovoltaic panels in the EU, the price of which remains relatively high (In Bulgaria, in 2010, the subsidy amounted to <= 5 kW €0.405/kWh > 5 kW €0.372/kWh, 8 times the

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regulated market price!). And the efficiency of mass-produced photovoltaics ranges between 12-16%.

Depending on the weight of the groups of factors, each economy chooses or historically develops a model for energy production, distribution and consumption, and local characteristics are of great importance. The issue is not only the availability/lack of energy resources, but also, for example, the seasonality of consumption, the presence of traditional social structures (e.g. mining settlements inhabited by several generations of miners), traditional long-life technological structures (NPPs), cultural attitudes and demographic structure of the population (conservatism or social mobility), etc. In some cases, the model can be illustrated by the so-called energy mix, allowing energy production to follow consumption (There is still no effective way to "store" electricity at a large magnitude). At the same time, power plants have the task not only to produce electricity, but also to ensure uninterrupted supply – i.e. the energy mix must allow flexibility.

3. Geographical and Technological Features of the EU, Energy Mix

The geographical diversity in the EU is considerable. Due to the cold winter in the EU member states of Central and Eastern Europe, consumption is pronounced seasonally.

Figure 7

Zero isotherm in Europe in January
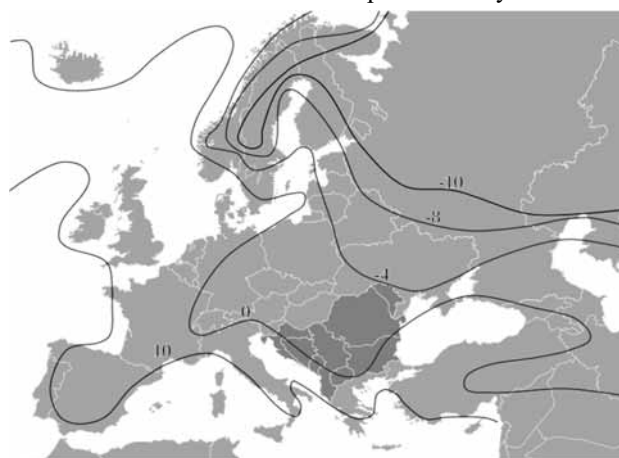
Source: https://ru.wikipedia.org/wiki/Isotherma_Erope_average_year.svg.

Favourable conditions (constant winds with speed in the required range) are along the Atlantic coast and the Central European Plain. The intensity of solar radiation is high in Southern Europe, and favourable conditions for hydropower are available mainly in Italy, Austria and Sweden (Also in Switzerland and Norway, which are in fact part of the EU's internal energy market).

Figure 8

Solar radiation in Europe
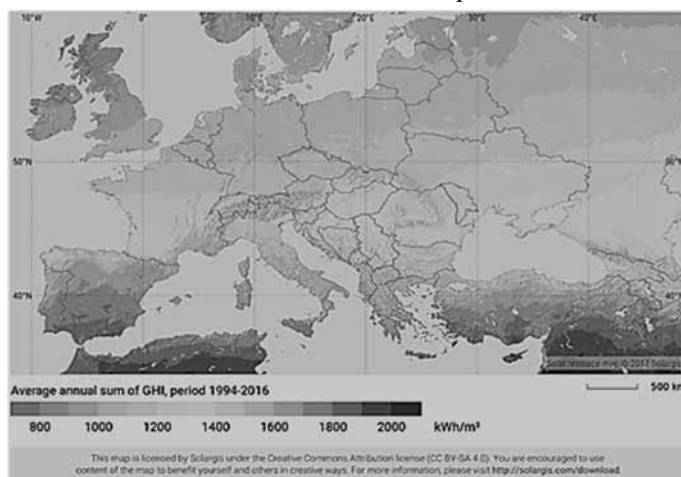
Source: https://solargis.com/maps-and-gis-data/download/europe.

There are serious coal reserves in Poland, Germany, less in the Czech Republic, Bulgaria and Romania. In Germany, however, due to the depletion of a large part of the surface deposits, the extraction is at a high cost.

Figure 9

Coal reserves in Europe

Source: https://euracoal.eu/info/euracoal-eu-statistics/.

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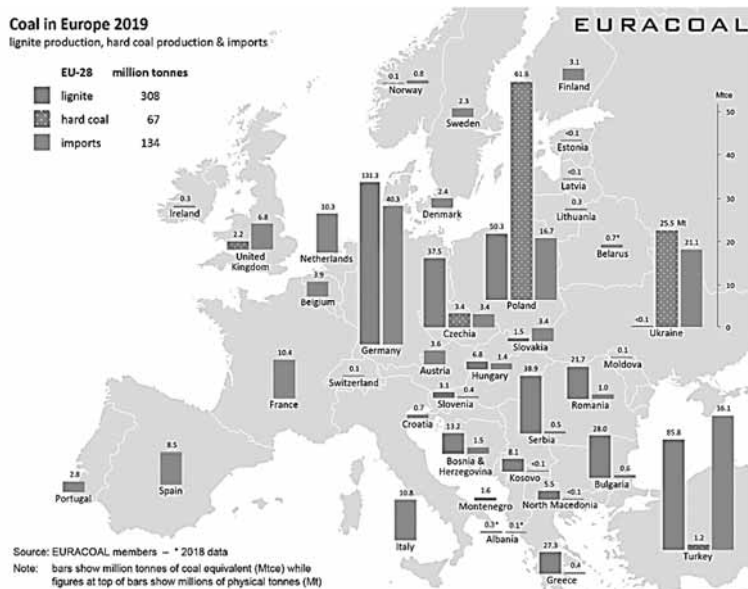
Added to this is the very uneven distribution of nuclear power plants with a very long service life.

Figure 10

Nuclear electricity in Europe

Source: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20180504-1.
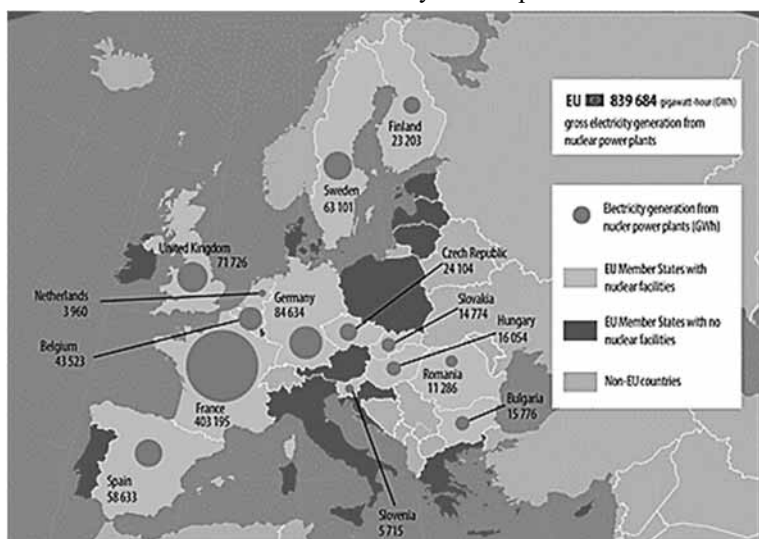
There are also major social differences in the Union, including electricity costs.

Figure 11

Household expenditures in the EU

Source: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20191127-1.
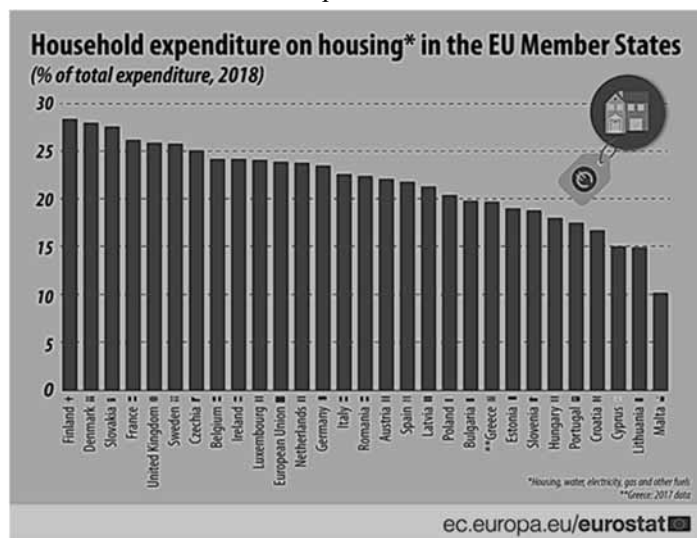
This makes it clear why it is very difficult to draw up a common EU energy strategy, together with the policy that should serve it. E.g. Poland, which relies heavily on coal, is only now planning to build an NPP. In Slovakia and Hungary, coal has been largely replaced by imported natural gas, but the overall picture is similar. The incomes of the population in most CEE countries are below the EU average and this makes it difficult to switch to green technologies.

As a whole, the EU includes highly developed countries with achievements in high-tech industries, incl. in energy. All advanced technologies are used in the production, distribution and distribution of energy. The scarcity of energy forces the emphasis to be placed on energy-saving technologies, which again calls for investment. The various natural features mentioned above give a very colourful picture of the main production facilities and, ultimately, a very diverse energy mix, allowing good coverage of both constant and variable consumption.

Figure 12

EU energy mix, including planned change
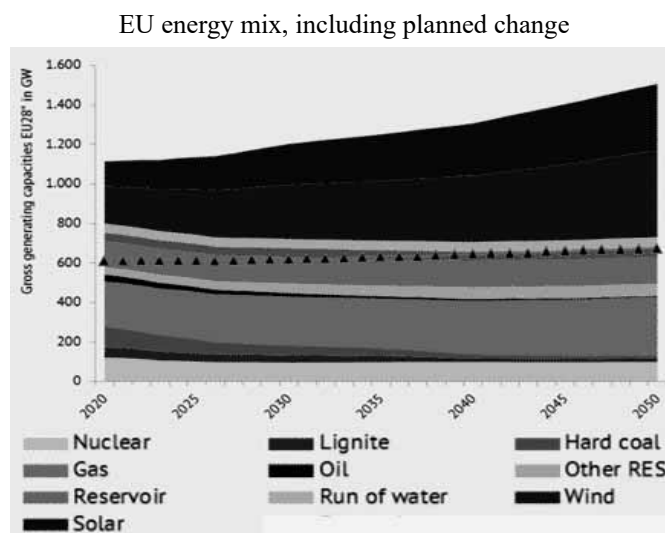
Source: Energy Brainpool, "Energy, transport and GHG emissions Trends to 2050 – Reference Scenario 2016".

The distance (driving route) between Tallinn and Lisbon is 4,167.55 km. This means that the transmission of electricity even between the two endpoints of the Union is theoretically possible: since the 1980s, an effective maximum length of the electricity transmission route of 7000 km has been established, with a transmission price between $0.005 and $0.02 per kWh (Deep Resource, Observing the world of renewable energy and sustainable living, 2017). In fact, this means that if Estonia buys electricity from Portugal, the agreed quantity will be delivered at the Portuguese border to the neighbouring market, and the corresponding volume will be delivered across the Estonian border from the nearest power plant with minimal losses along the route. For this purpose, an AC power grid with a single standard has been built, and technological innovations require the consideration of alternative solutions – such as a 'smart' electricity grid and an HVDC Grid.

To the technological and natural conditions described so far must be added the political and economic considerations discussed in the following sections.

These two groups cannot be completely separated at present, but there has been an interesting interaction between them in recent decades. In the 1980s, neoliberalism emerged as the leading ideology, and in particular, the scheme in which the free market and free competition guided the economy, and economic considerations, in turn, dictated politics. This paradigm, expressed in the Washington Consensus, determines the development of EU energy after the mid-1980s – towards privatization and deregulation. However, after 2006-2007, and especially after the onset of the global crisis, political considerations related to security and quality of life began to take precedence over economic ones, as exemplified by the "Green Deal". At present, these considerations are intertwined in a complex way in energy strategy and policy: the search for high efficiency, e.g. is concerned that EU imports 53% of the energy sources it consumes (Figure 6).

The fear of "climate change" not only imposes restrictions on energy production and consumption, but also places high demands on the Union's foreign policy, which must make similar sacrifices on the part of competing countries. In December 2019, EC President Ursula von der Leyen proposed to the citizens of the Union a "New Green Deal" and supported the achievement of a climate-neutral economy by 2050. Currently, the EU aims to reduce greenhouse gases by at least 40% to 2030 compared to 1990 levels, but the new Commission plans to raise the target for the next decade to 50 or 55% (von der Leyen, 2019). One of the mechanisms used is the imposition and permanent increase of the specific "carbon dioxide emission right" tax, which should lead to the phasing out of coal, natural gas and oil as an energy source.

In the name of achieving long-term strategic goals, free competition is distorted and set within certain limits, and efficiency is partially sacrificed. Coal loss can also cause other major problems, as flexible renewables are highly dependent on natural conditions and virtually completely independent NPPs lack flexibility.

In addition to this is the growing pressure for a gradual ban on diesel engines, but not in favour of railway transport, but in favour of electric vehicles, despite the low efficiency (see above) and unresolved problems with the disposal of used batteries. And charging electric cars with electricity produced by renewable energy sources, especially photovoltaics, is the worst possible energy solution. It combines low efficiency (including the construction of new infrastructure with incalculable costs) with the insecurity of supply and unpredictable environmental problems.

4. Building a Single Energy Market and Energy Union

The aim of building an internal energy market of the EU is to increase energy efficiency by connecting national and regional electricity and gas transmission networks and to establish common market rules across the EU. Part of these efforts is to build sufficient energy links between all the countries by 2020. The strategy includes, as a minimum, a cross-border electricity trade target of 10% for all Member States by 2020, whereby the European

Commission hopes to put pressure on energy prices, to reduce the need of building new power plants, to reduce the risk of interruptions or other forms of grid instability, to improve the reliability of renewable energy supplies and to promote market integration. The Member States agreed in January 2018 on the Commission proposal to invest €873 million in clean energy infrastructure, funded by the Connecting Europe Facility (CEF).

However, only 17 of the Member States have reached so far the objective mentioned above. The target is carried forward to 2030. Despite the increased number of gas and electricity links between the countries and the rules governing emergency aid, 150 more interconnections for natural gas and electricity will be required, according to a list of priority energy projects published by the Commission in March 2018 (Commission implementing decision, 2018). With regard to electricity, the parties have the difficult task of rearranging the market in order to accommodate the increasing share of still subsidized energy from renewable energy sources (RES), as well as imposing rules to promote the use of electricity of these energy sources and improving energy efficiency. Rules are in place in the EU to ensure that the Member States help each other if the gas supply is interrupted – negotiated after difficult negotiations. The agenda is to impose the same rules for electricity, and to clarify the reserves that must be accumulated if the Union fails to meet its 27% target for renewable energy.

Overall, the Commission proposes major policy changes for the period from 2021 to 2030, starting with changes in the legal basis of the Union electricity market and the greenhouse gas trading system. Guarantees of mutual assistance in the case of gas shortages should also be ensured. The aim is, after gaining the support of the Council of the EU and the European Parliament, to complete the Energy Union by 2019. According to Shevčovič (2017), former Vice-President of the European Commission: "*No longer a policy but a well-framed reality*". However, the common energy market – a vital part of the energy union project, failed to be completed by the deadline – 2015.

Member States are opposed to ideas, such as payments to a fund, if they fail to fulfil their renewable energy obligations or if they do not open their RES support schemes to outside companies. The risk of renationalization of energy policy during crisis fluctuations remains serious. Not only the energy crisis of 1973 (which subsequently turned into a structural one), but minor turmoil de facto reversed unification processes, forcing each country to look separately for ways to deal with the difficulties. Amidst of the cold wave that swept Europe in the early days of 2017, Romania, e.g. refused to provide "emergency assistance" to Bulgaria, urging the latter to activate the "cold reserve" (actually, the emergency actions included decreasing of frequency and curtailing of consumers or export) in order to avoid a power crisis. However, in order to ensure consumption, electricity exports have been stopped for almost a month. The export ban, imposed in many EU countries on the coldest days that winter, also had political motives (Anca Gurzu, 2017), and put the European Commission and Jean-Claude Juncker's plans for an Energy Union to the test.

One sign of incompleteness of the integration process in this area are the partial competences of the supranational governing bodies. The European Commission gained partial competences for supranational energy policy only in 1983, when the following objectives were formally set: supplying energy at acceptable prices, without endangering citizens' health and without harming the environment, and establishing a single internal energy market. However, Article 194 of the Treaty of the EU currently provides that certain areas of energy policy are areas of

shared competence, which mirrors the slow transition to a common energy policy. However, each Member State reserves the right "to determine the conditions for the use of its energy resources, to choose between different energy sources and to determine the overall structure of its energy supply" (Article 194). That means, that the general development of the energy sector, incl. supply, energy mix, structure of production and consumption, etc., remains mainly at a national level.

The European Commission has more serious competences with regard to coal and nuclear energy – here, it can act autonomously and directly as a supranational supervisory authority (see the European Coal and Steel Community and Euratom), respectively, as an international representation with respect to third countries. Regarding oil, gas and electricity, the Commission confines itself to fulfilling regulatory framework competences agreed with the Council of the European Union. It should be noted that, because the bulk of the energy is imported, the energy policy is directly related to the issue of the common foreign and trade policy, which requires long-term coordination of interests throughout the EU institutions. In the area of foreign policy, e.g. The European Commission has virtually no powers, unlike foreign trade. It can influence the energy policy indirectly through its competences in the fields of competition and environment.

The sovereignty of national states in the field of energy remains largely preserved. Due to the complex allocation of energy competences between national states and supranational institutions, the EU is still far from developing a common energy strategy and pursuing a common energy policy, which should ensure the achievement of strategic objectives in these areas. There are major differences between the Member States on key issues – energy mix, energy market, relations with partners – customers and suppliers, etc. Member States conduct their own energy policies in accordance with their economic and foreign policy interests, with their own resources and needs. As in other areas directly relevant to national security, more influential Member States are reluctant to compromise their national interests if they are not sufficiently protected in common energy projects. Through the Emissions Trading System and the cross border trade regulations (but also through informal pressure), the supranational authorities are on the way to gain more influence on the energy mix of the Member States of less economic and political weight.

For the first time, the Lisbon Treaty includes texts on energy, which should provide the legal basis for shared competence in energy policy. According to the opponents of a federalized union, Art. 176 of the Treaty represents a serious violation of national sovereignty with regard to energy policy. The stated objectives are:

(a) completion of the energy market;

(b) securing the energy supplies;

(c) promoting energy efficiency and development of new and renewable energy sources;

(d) interconnection of energy networks.

They are subject to co-decision by the Council of the EU and the European Parliament.

However, it is specifically stated that these measures do not affect the right of a Member State to determine alone the conditions for using its own energy resources, to choose between

different energy sources and to determine the overall structure of its energy supply. The pressure for more centralization has increased tangible in the last 4-5 years. The institutional and conceptual ambiguities in EU energy policy are best reflected in the problems of developing the electricity market.

4.1. Building a single electricity market

This market is among the few sectors of the EU Internal Market, together with medicines and weapons that have not yet been fully liberalized. Energy Union plans must ensure that electricity is moved and traded freely, even in times of crisis. The EC's efforts, which in this case have tangible competences, lead to very slow progress towards a single electricity market, and the resistance comes from key member states that want to pursue their own industrial and energy policies.

Their protectionism runs counter to the neoliberal model, which has prevailed, with some fluctuations, throughout the entire period of functioning of the EU Single Market – the heart of the European Union. At the heart of all practical action since signing the Treaties of Rome so far, and especially since 1986, is the conviction that the merge of individual national markets benefits all actors in the process through optimizing the production cost, approaching so the ideal point of intersection between supply and demand. Modern liberal thinking does regard the free movement of factors as a key for encouraging the optimal competition. It accepts relatively closed regional trade associations only insofar as a large regional market is preferable to many small, closed markets, so that the benefits of free trade can be realized at a regional level, if it is impossible to realize them immediately at a world level.

The program for completion of the EU Internal Market adopted in 1986 is based on the latest edition of the liberal theory expressed in the Washington Consensus. It places emphasis on the "free market", rejects the "state intervention" in the economy and relies on the "civil society" as a possible additional regulator. In the 1980s and 1990s, the adherence to these principles has become a leading political practice in most EU countries.

The Single Market project reflects precisely this philosophy and enjoys sufficient political support, but mainly during good economic conditions, and its principles are not fully implemented in all market sectors. In times of economic crisis, breaches of obligations already undertaken by the Member States on compliance with market rules are increasing, and initiatives to transfer the liberal approach to the remaining regulated market sectors are frozen. It is most difficult to impose uniform rules for all production and supply of energy, including electricity. In an attempt to impose some order, the European Commission launched in 2015 a State aid sector inquiry aimed at gathering information on capacity mechanisms to examine whether they ensure sufficient electricity supply without distorting competition or trade in the EU Single Market. It should complement the Commission's Energy Union Strategy to create a connected, integrated and secure energy market in Europe (European Commission, State aid to secure electricity supplies, 2015).

However, the European Commission remains a major supporter of the electricity market liberalization and seeks to assert that an efficient and fully functioning single European energy market will give consumers a choice between different electricity supply companies

and access to all suppliers, especially to smaller ones. Such a market should help the EU to overcome the economic crisis. As a result of European Commission efforts, the so-called Third Energy Legislative Package was adopted in March 2009. The document aims to move forward the liberalization of European electricity (and gas) markets. Under the new regulatory framework, Member States could choose between three different strategies for decoupling electricity generation from the operation of the transmission network:

- complete unbundling of ownership of the transmission infrastructure;

- creation of an independent system operator (ISO);

- Establishment of an Independent Transmission Operator (ITO).

The emphasis is on the efficient separation of energy production and supply from the grid. Unbundling should prevent grid operators from favouring their own energy production and supply companies on the market. For effective competition, the transmission system operators must guarantee non-discriminatory access to the transmission network of different electricity and gas providers, which is the third party access (TPA) principle (Boneva, 2014). (It remains unclear what the compensation should be for the owner of an existing network that allows competitors to access it. It also remains unclear what would motivate investors to invest in new grids who should provide power from energy independent sources.)

According to the principles of neo-functionalism, integration in the energy field (basic for social development) should provoke a chain reaction in other economic sectors and areas of public life towards further centralization of the Union. Although the process of integration, started with the European Coal and Steel Community, didn't exactly evolve according to the neo-functional logic, federalist officials continue to strive for control of the energy market, which the application of common internal market rules would provide them. In pursuit of this objective, they seek to establish a common strategy for the sector with obligatory for the Member States' rules set out in the Green Paper (see above) and related to the so-called 20/20/20 targets of the Europe 2020 strategy to increase the share of renewable energy and reduce energy consumption.

Despite the EC's efforts, the progress towards a single energy market, incl. towards a single electricity market, is slow. In the supply of electricity, the European Commission reported in November 2005 that there was a lack of integration between the national markets. This is due to the low level of cross-border trade (only about 11% of total consumption by 2005) due to existing barriers to access, inadequate use of infrastructure and poor connectivity between many Member States. Five years later, there is still a high degree of concentration in most national markets, with national companies controlling on average about 70% of the markets.

In an attempt to speed up the process, the European Network of Transmission System Operators for Electricity (ENTSO-E) was set up in Brussels on 19 December 2008 (A similar body – ENTSO-G, has been created for gas systems). ENTSO-E includes 42 transmission system operators and practically enforces its rules across the continent, excluding Russia and Belarus. The creation of ENTSO-E is linked to the adoption of the European Union's Third Legislative Package on Gas and Electricity Markets (2007), which seeks to enhance integration between Member States' markets as well as market elements in pricing.

The objective of ENTSO-E is to encourage closer cooperation between European energy transmission system operators in order to support the implementation of EU energy policy and to achieve the objectives of European energy and climate policy, which change the very nature of the energy system. ENTSO-E's main objectives are to integrate renewable energy sources (RES), such as wind and solar energy, into the electricity system and to build the internal energy market, which is vital for achieving accessibility, sustainability and security of supply. "*ENTSO-E aims to be the focal point for all technical, market and policy issues related to transmission system operators and the European network, engaging with consumers of electricity systems, EU institutions, regulators and national governments*" (Who Is ENTSO-E?) The Baltic States are currently joining ENTSO-E, unlocking from the energy network inherited from the USSR.

Figure 13 shows the main flows of cross-border trade in electricity, along with a network that is generally sufficiently built, with uniform technical standards. The general standard solves one problem – it turns the environment for the movement of information into a homogeneous one (Figure 3). The second problem remains to be solved – increasing the efficiency of transmission.

Figure 13

Cross-border electricity network and transmission volume by 2017

Source: https://deepresource.wordpress.com/2017/06/05/european-power-grid/.
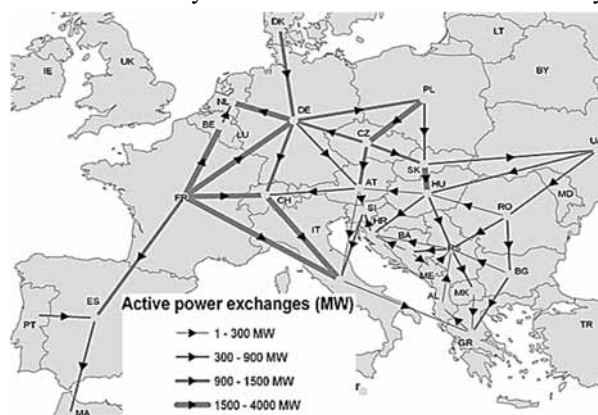
This task solves the construction of a new kind of 'smart' electricity grid – but this requires a very precisely built, mostly very flexible energy mix, to integrate energy from conventional, centralized generation sources with the production from renewable sources. The plans also envisage the creation of a European super grid to interconnect the various European countries and regions around Europe's borders – including North Africa and Turkey – with a direct high-voltage current (HVDC) power grid.

It is envisaged that a European super grid would optimize the production through sharing the most efficient power plants in the entire region, and also to allow for wider use of renewable energy, incl. wind energy (Atlantic coast) and solar energy (North Africa). (These plans

should take into account the political implications, though, for example, the civil war in Libya).

European super grid

Source: https://deepresource.wordpress.com/2017/06/05/european-power-grid/.
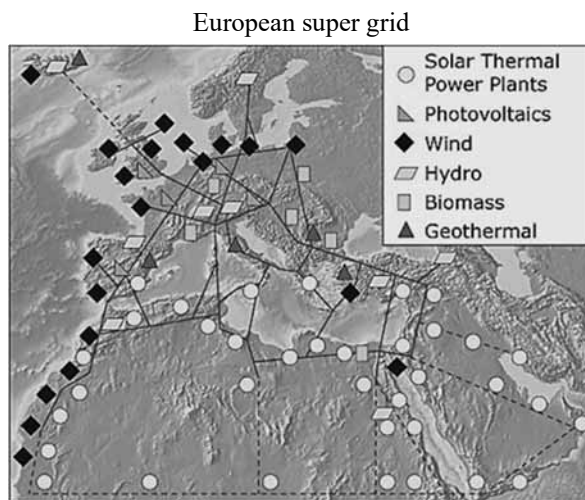
20 years after the start of liberalization, the legal basis for the common electricity market is in place. The market is divided into regional exchanges and is based on the assumption that trading opportunities within these areas are unlimited. The trade between bidding zones is limited to the level of the cross-border capacity, however, the cross-border infrastructure is used at only 30-35% of its capacity, according to the European Agency for the Cooperation of Energy Regulators, ACER (Simon, 2018). This creates technical boundaries but also political obstacles to the feasibility of cross-border trade. With the exception of Italy, Sweden and Denmark, stock exchange areas coincide with the political boundaries of countries. Significant price differences remain between them: from €9.1 per megawatt/hour in Estonia to €26.8 in Denmark in 2009. For 2017 the differences are similar for households: from €9.6 per megawatt/hour in Bulgaria up to €30.9 in Denmark for households. In industry, the differences are smaller: from €6.5 per megawatt/hour in Sweden to €14.8 in Denmark. (Europe's energy portal, 2019) In 2019 the situation remained unchanged (Figure 15).

It is clear that differences of two to three times between the lowest and the highest final price (including taxes) do not testify to the existence of a free electricity market. Apart from this, in Denmark, for example, the price difference between the two consumer groups is more than three times, while in Bulgaria it is less than 20%. This indicates that there are also major differences in pricing patterns across the Member States (including taxes, excise duties, environmental allowances etc.), i.e. energy policy remains first and foremost national, also because of its close connection with other areas such as security, social balance, etc.

Figure 15a

Electricity prices for households in the EU

Source: https://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics.

Figure 15b

Electricity prices for industry in the EU
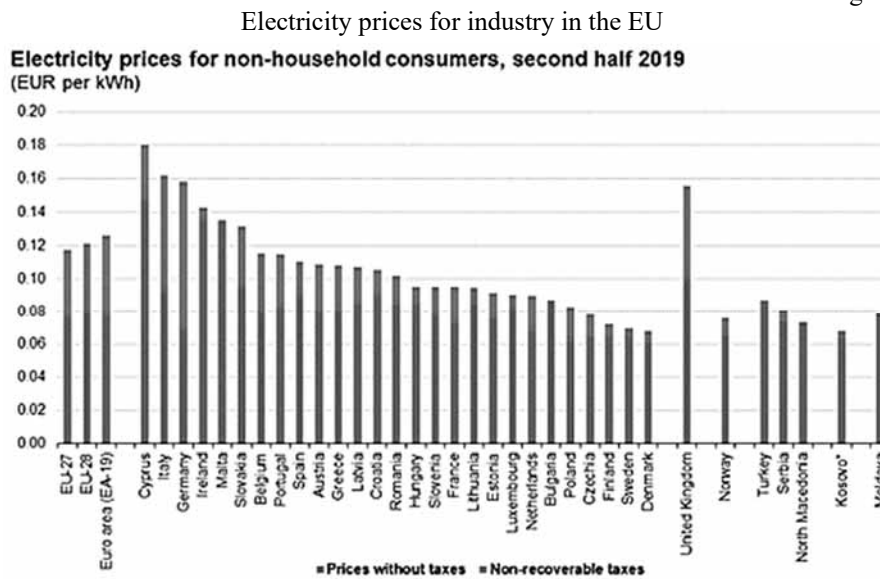
Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Electricity_prices_for_non-household_consumers,_second_half_2019_(EUR_per_kWh).png.

There are several ways to explain this:

It has been argued that France and Germany, as the largest producers and consumers, are sabotaging the Commission's efforts to free up the market because of the interests of leading

energy companies, but that does not describe the whole problem. Indeed, in Western Europe still persist the "economic patriotism", which, in addition to classical protectionism, also includes purposeful industrial policy. According to the New Political Economy (Watson and Higgott, 2008), restrictions on trade in certain areas are explained not by free-market defects but by political considerations. The state is expected not only to protect its internal market from external competition, but also to guide domestic enterprises' policies. By influencing the structure and size of enterprises, "national champions" are created in certain industries, which, by their size and by legal measures, can resist, for example, of attempts to be absorbed by foreign competitors.

The clearest example of such an approach is France, whose governments are pursuing a deliberate policy of creating and supporting "national champions", incl. through direct intervention in their management. (The legacy of the so-called "dirigisme", between 1945 and 1975.) Governments not only intervene in individual cases, but also seek to control overall development, incl. through deliberate law that hinders the penetration of foreign businesses in a number of industries deemed "strategic". There is public consensus on the fact that large, "symbolic" French enterprises (such as "Arcelor", "Danone", "Societe Generale", "Casino", "Saint-Gobain", "Thomson", "Carrefour", "Vivendi Universal", etc.) must remain "French" and enjoy special protection against ingestion. Foremost among them is the state-owned "Electricity de France" (EDF), the world's largest utility provider, with € 69.6 billion in revenue for 2017 (The EdF Group – 2017 Annual Results).

In Germany, industrial policy is not as focused and coherent as in France and often remains out of the public eye. The state does not intervene openly in the economic development or in the management of the individual enterprises, but is mainly concerned with the imposition and compliance with the framework conditions. Government interventions do not follow as much a strategy for economic development as they save jobs in critical cases. There is no official policy of keeping "national champions", but large companies are secretly given subsidies. Often, the executive branch authorizes mergers between companies despite antitrust legislation, on the grounds that mergers that have arisen become competitive within the EU or even in the global market. This is the case, for example, with the merger between VEBA and VIAG in 2000, which launched E.ON and later the merger between E.ON and Ruhrgas in 2003. Today the company is a key player in today's electric oligopoly of the German market.

In both countries, and not only in them, the attitude to the production and supply of electricity (gas, water) is special because it affects national security and requires guarantees of continuity of supply while maintaining control (usually through state monopolies). Electricity is a particular, vital commodity for social development, and countries, especially social ones, have little desire to fall depending on private producers and suppliers. There are strong fears that free pricing may also lead to higher prices in backward, sparsely populated areas with poor infrastructure, further increasing their backwardness.

The pursuit of liberalization is also confronted with a problem that is being ignored by supporters of the free market. Energy consumption is slightly price-elastic. Low elasticity always works in favour of the formation of monopolies or oligopolies. The cartelization of the market is possible even with a larger number of market participants. In this case, transmission networks facilitate this process: in the case of the apparent inability of each

provider to build its own network to the consumer, issues related to equal access to the available network, its ownership and operation, etc., remain unresolved.

Separation of production from distribution is intended to break the possible monopoly of the sole (in most cases) unit of production facilities and the network, but on the other hand, it impedes vertical integration in enterprises and eliminates the resulting production savings. Electricity supply technology implies a technological monopoly, but it easily becomes an economic monopoly. A large enough electricity market can easily be geographically cartelized. And the privatization of production and distribution can further worsen market conditions. However, the state monopoly is subject to political control and restrictions: the government has direct responsibility for the monopolist's activities and cannot ignore the mood of the voters (consumers). State monopolies are also directly tied to the state energy strategy, which has a long time horizon and does not put a rapid return on investment in the first place. Private electricity providers are not bound by such considerations and do not pay the political cost of abusing a monopoly position.

The examples from countries with a liberalized electricity sector seem to confirm these concerns. The California energy crisis of 2000-2001 is driven by price increases, uncertainty in supply and large-scale market speculation (Johnston, 2007). Contrary to expectations, deregulation did not encourage the opening of new capacity. On the contrary, in January 2001, producers began closing down capacity to further increase the cost of energy, which had already jumped 8 (!) times between April and December. (Said, 2001) In 2007, the US Department of Energy published a study where it states that between 1999 and 2006, electricity prices in the free-market states increased more than in the regulated markets (Annual Energy Review 2006, 2007).

In the EU, the liberalization of the electricity market began in the 1990s with the provision 96/92 / European Commission of 1997, which envisaged the gradual opening of the market by 2007 (30% to 2000, 35% by 2003). Till 2000 Sweden, the United Kingdom, Germany and Finland had already fully opened the markets to free, incl. external, competition. Since then, however, there has been evidence that, under the changed conditions, suppliers are once again dictating market rules through the formation of private oligopolies.

The EDF mentioned above, until 2004, was a fully state-owned enterprise and until 1999, it was a monopoly supplier of electricity to the French market. Under the pressure of the European Commission (Electricity Market Regulation Directive), state participation has been reduced to 85%. From 4% in 2000, the market share of EDF's competitors reached 21% in 2006, and by legal decision of June 2010, the monopoly was formally decommissioned (EDF must sell up to 25% of its competitors' production capacity in the case of GDF Suez, in which the State still holds 35% of the capital) (Electricity price statistics, 2020). The French electricity market is currently the most open to competition after Germany and the United Kingdom. However, the price of electricity for households increased from € 10 per megawatt/hour in 2000 to €16.7 per megawatt/hour in 2017 for households. (European Commission, Market analysis), Taking into account all factors (inflation, fluctuations in the common currency and energy sources worldwide, etc.), this increase is not in support of the expected benefits of liberalization. The assumption that the electricity market may combine high competition with low prices (so far) is not confirmed by practice.

The British market is most often cited as an example of complete liberalization. As a result of the legislative measures, the number of suppliers there has increased from three large (and five small) enterprises to more than 40 (including E.ON and EDF), with the largest market share of one supplier reduced by 48% on 21%. Wholesale electricity prices have fallen by 40% since 1997 compared to 2000. The price movement then, however, almost completely coincides with the price movement in the related neighbouring French market – from €10 per megawatt/hour in 2000 to $17.7 per megawatt/hour for 2017 for households.

In Germany, the example is even more disappointing. The German market is, in fact, distributed among four major suppliers: E.ON, RWE, EnBW and Vattenfall. There, the average price of electricity fell by 20% immediately after market liberalization, but subsequently increased again to mark an overall increase of 113% (from €24 per megawatt/hour to €51 per megawatt/hour) between 2001 and 2006 According to the Union of Energy Consumers, customers in Germany pay € 13.5 billion more annually for electricity due to stock speculation of large companies that buy mass electricity from smaller ones, thereby increasing the prices of the energy exchange. The electricity is then resold at a high profit, and the base price for customers is the price of the more expensive producers. Thus, the company, which has a cost of €17 for 1 megawatt of power, gets €50. These machinations raise the price of electricity by 30%. The gains of Germany's four largest concern E.ON, RWE, EnBW and Vattenfall (with a total share of 80% of total production), jumped to more than €17 billion in 2006. And by 2019, electricity prices there are still among the highest in the EU (Figure 15). It is no coincidence that Germany, together with France, is at the forefront of a large group of countries that oppose the EC's attempts to liberalize the EU electricity market, according to its ideas.

Judging from the result, it can be seen that, despite the explanations (too liberalized or, on the contrary, not sufficiently liberalized), retail electricity prices have increased by about 3% annually since 2008, according to European Commission acknowledgements in the second report on energy prices and costs in Europe in 2016 (Andre Tauber, 2015). At the same time, the fall in the prices of internationally traded energy commodities (mainly crude oil, whose price has decreased by 60% since 2014), reduced the cost of energy imports in the EU by 35% since 2013. Gas prices, e.g. have fallen by 50% since 2013 – due to lower global demand for energy, increased shale gas supplies in the US and better access to liquefied natural gas (LNG) in Europe, and low oil prices. The European Commission noted the increasing convergence of prices across Europe, as evidence that the EU's internal energy market is functioning, but had recognized that household energy costs (excluding transport fuels) increased up to 5.8% of their total expenditure, as opposed to 5.3% in 2008. For the poorest households, energy expenditure reached 8.6% in 2014.

The task of keeping price growth within acceptable limits is performed by the national energy regulators, united in The Council of European Energy Regulators (CEER), striving *"...to facilitate the creation of a single, competitive and sustainable internal market for gas and electricity in Europe"* (https://www.ceer.eu). On the one hand, 'regulated prices' is a concept which is in sharp contrast to the concept of a free market and competition. On the other hand, the citizens of the EU have the right to expect a positive rather than a negative economic effect of integration, which should also be the major focus of European Commission efforts.

4.2. Lack of consensus in nuclear energy

Nuclear energy generates very efficient electricity compared to coal-fired power plants. One ton of natural uranium can produce more than 40 million kilowatt-hours of electricity. This is equivalent to burning 16,000 tons of coal or 80,000 barrels of oil. Coal and oil combustion are major sources of greenhouse gases, and nuclear power plants do not contribute to global warming. But attitudes towards nuclear energy are the weakest point in attempts to build a common EU energy strategy. Euratom was established in 1957 with the original purpose of creating a specialist market for nuclear power in Europe, by developing nuclear energy and distributing it to its member states. But over the past 60 years, progress in the Community has been very uneven.

While the number of nuclear reactors worldwide is growing, only in the EU is the trend reversed. (In the USA, their number decreased from 104 to 96 within the last 16 years, but the total nuclear electricity generation capacity and its share in the total consumption remain constant. See Nuclear explained. US nuclear industry, EIA, 2019.)

In general, for the Union, nuclear energy has the weakest support in public opinion (20% approval) compared to all other types, but with serious differences in individual member states, which are strongly influenced by the short-term situation. In early 2018, an EP opinion acknowledged that "*nuclear energy is a low-carbon alternative to fossil fuels and represents a critical component in the energy mix of 13 of the 27 EU Member States, accounting for almost 26% of electricity produced in the EU*" (European Parliament, Fact Sheets on the European Union, 2020).

However, with the fall in hydrocarbon prices and the outbreak of the financial crisis, and especially after the 2010 Fukushima accident, discussions on further investment in nuclear energy have stalled. France, for example, in response to the October War and the crisis of 1973, developed nuclear energy to minimize dependence on external energy supplies, including from the politically unstable Middle East. Nuclear power produces up to 75% of the country's electricity, which ranks it first in the world. The country will rely on this technology in the future. In February 2014, the country's parliament approved a program to extend the life of reactors in the amount of 55 billion euros, including €15 billion for the replacement of massive parts in all 58 reactors, €10 billion for additional security measures related to the Fukushima accident and €10 billion for strengthening protection against external influences (including anti-terrorism measures). The main part of the program must be implemented by 2025. Despite all the fluctuations in the political situation, public support for this policy remains constantly high.

Germany, on the other hand, has pursued a policy of abandoning nuclear energy since 1998, although a 2007 poll shows that 67% of voters oppose plans to shut down nuclear power. (Nuclear Power in the European Union, 2020) Following the Fukushima accident in 2010, the decision to phase out nuclear energy became irreversible. Italy is so far the only country that has closed all its nuclear power plants and completely abandoned nuclear energy. Belgium (with a share of 53% nuclear power and 40% coal in electricity production), like Germany, has a long-term policy of abandoning nuclear energy. Spain (21% share of nuclear power) continues to rely on NPPs without expansion plans. Lithuania sacrifices its Ignalina nuclear power plant on entry into the EU, Austria and Poland for political, economic or

technical reasons suspend their nuclear programs before the launch of their first nuclear power plant, although Poland (95% share of coal!) no longer rules out a turnaround in this aspect. In the Netherlands (4% nuclear power) and Sweden (35-40% nuclear power), there are fluctuations, recently the policy has turned in favour of nuclear energy. Greece, Denmark, Ireland, Latvia, Luxembourg and Portugal have abandoned their nuclear capacity plans.

Thus, in the EU, there are countries that do not question the nuclear power, there are hesitant (like Bulgaria), and there are countries – Austria, Greece, Malta, Cyprus, Ireland, Latvia and Belgium, which have pursued a firm 'anti-nuclear' policy over the last decade.

Obviously, the consensus seems impossible, and precisely on the only energy technology that has both great production potential and eliminates major risks in fuel supplies: the EU relies on uranium supplies from Russia (26.5%), Kazakhstan (18.5%), Canada (17.8%), Niger (13%) and Australia (12%) (Archive: Consumption of energy, 2017). In this case, it is important that there is no such clear dependence on one main supplier as is the case with other energy sources.

Figure 16

Imports of uranium into the EU
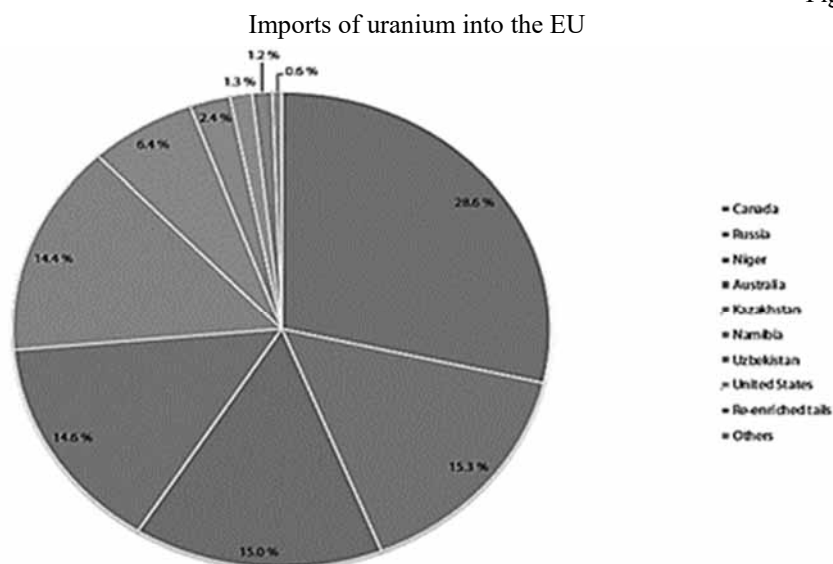
Source: „EURATOM Supply Agency, Annual Report 2017", http://ec.europa.eu/euratom/ar/last.pdf.

Nuclear energy is able to produce the necessary energy and, to a large extent, replace carbon energy sources (electricity for transport). However, accumulated prejudices, due to cultural differences, prevent the mobilization of resources at the community level to build new facilities that require large initial investments, as well as to seek an acceptable solution for the storage of waste in production. Instead, the share of energy produced at NPPs decreased by 16.7% between 2006 and 2018 (Nuclear energy statistics, 2020). Attempts to permanently shut down existing or decommissioned NPPs continue, reducing the chances of achieving both goals at the same time: reducing dependence from external supplies and reducing

damage to nature (*„Do no significant harm"*, Regulation 2020/852 of the European Parliament and of the Council).

5. Energy Security and External Challenges

Energy security deals primarily with the dependence on gas imports (through tankers, oil can be supplied from multiple starting points). It is desirable for the EU countries to have at least three different sources of gas, with supplies paid on the market course. This broad topic should be considered separately.

Concerns about energy dependence are mostly related to Russian supplies. But they are not just about the gas market. Until joining the EU, the Baltic countries had their own uninterrupted source of electricity – the Ignalina nuclear power plant, built during the Soviet era with two power units with a capacity of 1300 MW each. After 2005, the power plant was closed under the Accession Treaty, but the Baltic countries became an energy-deficient region. Both Belarus and Russia are ready to supply electricity to the Baltic States at low prices. The energy systems of Belarus, Russia, Estonia, Latvia and Lithuania form the so-called "BRELL Electric Ring", the work of which is coordinated under a 2001 agreement.

But in early 2017, the Center for Energy Security (NATO) prepared a secret report on the risks of energy dependence of the Baltic countries on supplies from Russia. As a result, the three countries in September 2017 decided to withdraw from BRELL by 2025. Electricity prices are expected to rise by about 15 to 30%. European electricity tariffs are significantly higher than Russian ones. For comparison, electricity is sold to Russian consumers at a price of 0.058 USD per kWh for households and 0.085 USD for businesses (Uche-Soria and Rodríguez-Monroy, 2020). At the same time, Belarus is launching the Ostrovets NPP. The plant is located only 25 km from the Lithuanian border. For political reasons, the Lithuanian side refuses to buy electricity from Minsk, urging the Belarusian authorities to stop the project.

In addition, the total cost of synchronizing the Baltic electricity grids with that of the EU is €1.5 billion, with a total GDP of €90 billion for third countries. The European Union is expected to fund 75% of the costs for the first phase. At the same time, the dismantling of the Ignalina nuclear power plant requires a total of 3 billion euros. The aid from the EU budget covers part of the amount, but there is no decision yet on the remaining 1.2 billion euros. The Baltic countries are relatively isolated. The combined impact of the six pillars: sustainability, renewable energies, energy efficiency, self-consumption regimes, electrification of energy demand and electrical interconnections (Uche-Soria and Rodríguez-Monroy, 2020) predicts consolidation of the energy poverty there with all possible social and hence political implications.

6. Conclusion

The EU attempts of constructing a common energy policy show signs of systematic behaviour, but not always the reaction to the challenges is clear and one-way. Economic,

political and security considerations related to the dependence on strategic raw materials and energy imports are closely intertwined with those of nature protection and quality of life. At present, there is no common energy policy in this vital sector (despite the expectations of functional transfusion theory), which is not yet the behaviour of a completely open system. There are still neither suffusion links between the different energy sectors, nor is there (so far) a tangible link with the Single Market.

Efforts to impose a common energy policy continue to deliver partial results, but they are based partly on miscalculations and false predictions. The Union's energy strategy is lacking, and efforts to build it often neglect technological and economic factors.

A **SWOT analysis** of the EU's energy strategy and policy could be presented as follows:

1. **Strengths:** EU's energy strategy

   - covers a region with dimensions that allow efficient energy distribution and consumption;
   - tries to reduce external energy dependence;
   - recognizes the risks of adverse effects of human activities on the environment;
   - stimulates the development and use of new technologies and imposes high technical standards.

2. **Weaknesses:** EU's energy strategy

   - exaggerates the risks of adverse effects of human activities on the environment. The strategy is based on controversial political considerations, neglecting technological and economic factors;
   - does not properly take into account the Union's energy "poverty" and sacrifices the only energy sources it possesses – coal, neglects nuclear energy and relies on uncertain alternative sources;
   - exposes for political reasons the relations with important external energy suppliers to unnecessary risks;
   - relies too much on economically unjustified alternative energy sources and offers an unsustainable energy mix;
   - risks losing international competitiveness and straining relations with major partners and competitors.

3. **Opportunities:** EU's energy strategy should

   - analyze accurately and rethink the risks to the environment;
   - analyze accurately and rethink the consequences of the "Green Deal" for the social balance in the member states;
   - find a consensus on nuclear energy and to mobilize resources for its development, including using advanced technologies;

- revitalize Euratom.

4. **Threats:** EU's energy strategy should **not**

    - spoil further balance between technological, economic and political factors;

    - maintain the current political situation, which requires "green" but wrong solutions to long-term energy problems;

    - prolong the inadequate interventions in North Africa with all negative consequences for the possibility of energy supply from the region.

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Bilgehan Tekin[1]

MODELING THE RELATION OF FINANCIAL INTEGRATION-ECONOMIC GROWTH WITH GMM AND QR METHODS[2]

Although international financial integration is an essential topic in economics and finance disciplines, researchers do not have a clear consensus on the relationship between financial integration and economic growth. The main reason for this situation is that financial integration can be heterogeneous and may differ according to the countries' income levels. On the other hand, most studies on the subject have accepted that financial integration has a homogeneous effect on growth by using a sample of countries with a heterogeneous structure. In this study, unlike traditional methods, the generalized method of moments and quantile regression analysis allows a comparison according to the countries' income levels, used together. Fifty-two countries were taken as a basis for the 2000-2019 period. The effect of financial integration and control variables on economic growth was tried to be measured. As a result of the study, direct foreign capital investments, portfolio investments, and current account balance have positive and significant effects on economic growth, and the effects of direct foreign capital and portfolio investments, current account balance, and inflation on economic growth differ between countries with high and low-income levels.
Keywords: Financial Integration; Economic Growth; GMM, Quantile Regression
JEL: F15; F36; F43

Introduction

The policies limiting international capital movements were widely accepted around the world for a certain period. However, the studies on this subject showed that the limitation of capital movements seriously harmed the country's economies. As a result, countries have been involved in financial integration by opening their financial markets to other countries in financial liberalization. The increase in financial liberalization has increased the trade volumes by reducing the borders between countries, and thus the economic synchronization process has accelerated. Free movement of capital, which constitutes one of the essential economic integration elements, is possible by opening financial markets to the outside. Today, countries are trying to establish competition policies to grow, create employment

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opportunities, provide positive macroeconomic indicators, and attract private capital movements to their countries.

The relationship between financial growth and financial integration, which is going through a faster process today, is the focus of many studies. Still not possible to make a general determination in terms of the finance-growth relationship's direction and strength, the determinations made have changed over time (Akkay, 2010, p. 56). However, market-based economies' change policies require developing and developed economies to improve their financial systems within the framework that resources are allocated to the most appropriate areas. The financial sector's primary purpose is to increase savings, investment opportunities, and risk diversity in economies. In such an environment, financial integration aims to provide more resources and benefits to economies and accelerate economic growth.

According to Levine (2005), financial integration refers to integrating local financial systems with international economies' financial systems. Integration begins when countries move the capital from local markets to international markets (Levine, 2005). Financial integration can be defined as a process in which the financial market in a country's economy is closely integrated with other countries' markets. With financial integration, there is an increase in capital flows and balancing for the prices and returns of financial assets traded in countries (De Brouwer, 2005). Baele et al. (2004) stated that financial market integration could only be mentioned if the following three are achieved; the unity of the rules to be applied to financial instruments and services is to ensure equal access to such tools and services and to treat parties equally in transactions in the market.

Saifuzzaman et al. (2016) state that while the positive effect of financial integration on growth is seen in developing countries, this effect is not seen in developed or underdeveloped countries. For developing countries, the capital flow is used as financing in sustainable investment projects. Otherwise, it contributes to the growth of the country. Numerous researchers have studied the relationship and causal links between economic growth and financial integration. Considering the studies' findings in the literature, it is concluded that financial integration supports economic growth and development, albeit at different levels. Levine (2001) emphasized that financial integration will contribute to growth by improving local financial systems' functioning through intensifying competition and importing financial services.

On the other hand, economic growth occurs with increased production factors and the increase in productivity using these factors (Gregorio, 1999). An efficient and efficient financial system in a country contributes significantly to economic growth. According to Goldschmidt (1969), financial integration contributes to economic growth in two ways. Thus, while the development of local financial markets increases capital accumulation efficiency, financial intermediation can increase the saving rate and, thus, the investment rate.

Studies on the subject are not entirely successful in explaining clearly the relationship between financial integration and economic growth, which expresses the financial openness level of a country to global markets. One of the main reasons for this is that the measurement of financial integration between countries exhibits a complex structure. Since financial integration is difficult to measure objectively, estimating its impact on the economy is equally tricky (Juraev, 2013, p. 3). In this study, with the desire to make a significant contribution to

the literature mentioned above, the relationship between financial integration processes and economic growth levels was investigated by the GMM method. The sample consists of 52 countries, whose data can be accessed in full. Under the following titles of the study, firstly, the literature on the subject will give. The analysis methods, the results obtained will mention, and the conclusion section will give at the last stage.

Literature Research

The concepts of financial integration and financial globalization are frequently used interchangeably. However, these two concepts essentially contain different meanings from each other. Financial globalization is a general concept referring to the increasing global connectivity created through cross-border financial flows. Financial integration refers to the links of a single country with international capital markets. Although these concepts are closely related, they are fundamentally different (Kose et al., 2003, p. 2).

Financial integration is considered a vital factor in promoting a more efficient financial system (Obstfeld, 2009). Selvarajan & Ab-Rahim (2020) emphasize that financial openness and integration can be considered a double-edged sword. The economic growth increase with the connection between these two factors and through technology and capital accumulation. However, this also increases vulnerabilities that may lead to a financial crisis (Osada, Saito, 2010; Mahajan, Verma, 2015). Financial integration offers countries more opportunities and leads to higher economic growth in theory. The financial system that integrated let the free flow of capital and participating countries benefit from portfolio diversification returns (Mahajan, Verma, 2015). Although these gains do not entail significant risks, financial integration flaws due to country-specific characteristics can cause volatility in the economy (Ramey, Ramey, 1995; Hoxha, et al., 2013). This is particularly important in developing countries with weak policies, poor financial stability, or marginal creditworthiness. Therefore, variable capital flows carry liquidity risk due to the possibility of capital flowing in the opposite direction in the event of an economic shock or a recession (Aziakpono, 2013). According to Agenor (2003), the appreciation of the exchange rate because of inflationary pressures, monetary expansion, and large and rapid capital inflows can negatively affect the stability of a small and developing economy (Selvarajan, Ab-Rahim, 2020, p. 192).

Many studies in the literature have focused on research on the relationship between economic and financial development. Although the history of these studies dates very back (Schumpeter, 1912; Robinson, 1952; McKinnon, 1973; Shaw, 1973; Lucas, 1988), this relationship continues to be an essential subject of research and discussion today (Levine, 1997; Rajan, Zingales, 1998, 2004; Tsuru, 2000; Levine, 2003; Eschenbach, 2004; Demirgüç-Kunt, Levine, 2008; Bonfiglioli, 2008; Acaravci, Öztürk, Acaravci, 2009; Choong, Chan, 2011; Al-Malkawi, et al. 2012). It is argued that the development of financial markets supports economic growth through various channels in the study, which has many and robust empirical results. On the other hand, some studies suggest that underdeveloped financial systems prevent international capital and trade flow and significantly slow down countries' economic growth rates (Ahmed, 2016, p. 43). Efforts to restructure financial systems have increased in many developing countries to avoid the negative consequences of

the financial system's inadequacy. The financial system facilitates global financial integration by international standards and creates a favourable environment for foreign direct investment (FDI) and stock flows (Ahmed, 2016, p. 43).

The studies on the effects of financial integrations on growth use various methodologies and reveal different results. Mesten (2008) states that the integration of financial markets leads to more capital accumulation and economic growth and increases the supply of funds by providing financially less developed countries with access to distant financial markets. The main reason for this effect is that markets become more efficient and sophisticated with increasing competition (Masten et al., 2008).

Considering the theoretical studies on the subject, financial integration, directly and indirectly, affects economic growth. Obstfeld (1994) emphasized that financial integration can improve capital allocation. The direct financial integration channel can positively impact growth by facilitating the efficient international allocation of capital and international risk allocation (Fetai, 2015, p. 98). Indirect financial integration implies that the development of national financial markets contributes to economic growth. This happens in two ways: First, competition from foreign financial intermediation can increase through financial integration. As a result, there is a decrease in investment cost and efficiency (Levine, 2001). Second, financial integration provides access to foreign financial markets and supports financial development, as it enables direct loans through foreign financial intermediaries (Fetai, 2015, p. 98).

Financial integration also affects the domestic markets of countries. Institutional improvements through financial integration (regulations that increase overall stability and reduce asymmetric information problems) affect internal markets through corporate governance. On the other hand, foreign financial intermediaries' access to foreign financial markets occurs through direct lending and being listed on foreign stock exchanges. This is expressed as the second channel through which financial integration affects financial development (Masten et al., 2008).

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However, another issue emphasized in the literature in the context of financial integration is foreign direct investments. Many economists and theorists have emphasized a relationship between economic growth and foreign direct investment (FDI) inflows. Iacovoiu and Panait (2014) show that as economies develop and grow, the infrastructure in those countries, employees' qualifications, etc. They also stated that the opportunities would improve. This will encourage the direct investments of international companies that want to convert their ownership advantages into capital at a more affordable cost. Iacovoiu (2018) showed a weak positive correlation between economic development and foreign direct investment flows.

In the context of financial integration, the subject of researching the relationship between foreign direct investments and economic growth attracts significant attention, especially by the administrations of developing countries, as well as in the academic field. In developing countries, since economic growth is one of the main focal points, policies regarding FDI attractiveness are prioritized in the economic growth and development process (Vo et al., 2019) and stated that FDI reduces the savings-investment imbalance supports the technology used in the production of goods and services. FDI increases human capital as well as tax revenue (Buckley et al., 2002). It can be said that FDI is one of the essential factors for the financial integration process as it increases long-term benefits and connections between different countries (Dinh, Vo, Nguyen, 2019).

Theoretically and by policymakers, the importance of foreign direct investment is emphasized at every opportunity. On the other hand, we frequently come across studies conducted in practical terms. Significant parts of these studies examine the impact of FDI on emerging economies. Lucas (1990) and Gourinchas and Jeanne (2013) emphasized that FDIs are mainly attracted by developed countries, although they are based in developing countries. Studies conducted based on developed countries include studies by Mencinger (2003), Carkovic and Levine (2005), Johnson (2006), Türkcan, Duman and Yetkiner (2008), and Herzer (2012). The results of these studies generally suggest that FDI has a negative effect on growth. On the other hand, in studies based on both developed and developing countries like Olofsdotter (1998), Reisen and Soto (2001), Alfaro et al. (2004), Li and Liu (2005), Batten and Vo (2009), the positive effect is pointed out (Bermejo Carbonell, Werner, 2018).

Borensztein et al. (1998) analyzed the impact of FDI on economic growth between 1970 and 1979, 1980 and 1989. The authors concluded that FDI positively influenced economic growth and that FDI and domestic investment complement each other. Based on their study results using panel data from 18 countries in Latin America, Bengoa and Sanchez-Robles (2003) concluded that FDI positively affects economic growth when countries have sufficient human capital, liberalized markets, and economic stability. Soltani and Ochi (2012) found a causal relationship between economic growth and FDI in their study using data from 1975-2009 in Tunisia and concluded that FDI causes significant economic growth (Ameer, Xu, 2017).

Ameer and Xu (2017) emphasize that the effects of foreign direct investments in developed and developing countries may differ. The first reason for this difference is that financial markets are not well developed in many developing countries. Many companies do not have access to foreign capital markets in developing countries. Companies in these countries also face more and more financial constraints. Second, foreign direct investment outflows are likely to reduce domestic capital. Therefore, when outgoing investors have scarce domestic resources, they can reduce domestic production. Third, the ability to receive information from abroad depends on the absorption capacity of the investing firm. Firms with low technological capacity will not be able to access information effectively through FDI outlets. In their study, Ameer and Xu (2017) determined that foreign direct investment outflows and inflows positively and significantly affect economic growth in developing economies in the long run.

Data Set and Econometric Method

The relationship between financial integration and economic growth was discussed in this study. The Generalized Method of Moments (GMM) and Quantile Regression Analysis (QRM) were performed, using annual data for the 2000-2019 period based on 52 countries whose data can access fully regardless of their development level. Since the data set has T<N characteristics, the time or period is less than the number of countries (cross-section), and we decided to use the GMM method first. The data set was obtained from the World Bank database. The variables used in the study are portfolio equity net inflows (current US $), current account balance (% of GDP), inflation consumer prices (annual %), foreign direct investment net inflows (% of GDP), foreign direct investment net outflows (% of GDP) and GDP per capita (current USD).

Generalized Method of Moments (GMM) Approach

In recent years, panel data analysis has been used more frequently in the finance discipline. The use of panel data analysis methods brings some advantages. For example, since the panel data set provides the opportunity to analyze with more than one section, it is possible to work with a large data set. In this way, the short time series expands with the added sections and works with data with short time dimensions created (Baltagi, 2005). However, despite these advantages, there are some weaknesses in panel data analysis. For example, panel estimation results become biased in models with dynamic relationships (Baltagi, 2005).

Also, panel fixed effects and panel random-effects models do not give meaningful results in panels where the following situations are in question (Roodman, 2006; as cited in İskenderoğlu, Karadeniz, Atioğlu, 2012):

- Time dimension involved in undersampling;

- There are many data;

- The linear relationship is emphasized;

- The lagged value of the dependent variable is included in the sampling as an independent variable;

- The independent variables are not entirely exogenous;

- Although there is no variance and autocorrelation between the data, there are different variances and autocorrelations in the data;

- The time dimension is small, but the data is large.

Lars Peter Hansen formalized the GMM estimator in 1982 as a generalization of the moments method, which came to the fore as a result of a study by Karl Pearson in 1894. Generalized Method of Moments (GMM) is a suitable method to obtain consistent and asymptotically distributed estimators of statistical models' parameters. The method has been applied in many economics areas, but most frequently in finance (Hall, 2009, p. 1). Unlike the maximum

likelihood estimate (MLE), GMM does not require full knowledge of data distribution. For the GMM estimation, only certain moments are derived from the basic model needed. While in some cases where the distribution of data is known, MLE can be very computationally burdensome; GMM can be easily applied. For models with more torque conditions than model parameters, GMM estimation provides a more straightforward method to test the proposed model's properties. The Arellano-Bover/Blundell-Bond Generalized Moments Method was first proposed by Arellano-Bond (1991) and later developed in Arellano-Bover (1995) and Blundell-Bond (1998). Because the data considers the time series feature and does not include biased results, GMM is carried out in this study. The validity of the results of the Arellano-Bover/Blundell-Bond System GMM can be realized with two different post-prediction tests. The first is the Sargan or Hansen J test, which shows whether the tool variables used in GMM estimation are used precisely and correctly. The other is the first and second-order autocorrelation tests (İskenderoğlu, 2008, p. 155). Since the GMM methods' predictions were tested with instrument variables, these variables were expected to reflect the main variables fully. It is necessary to perform the Sargan or Hansen test to measure this situation (Gujarati, 2004, p. 713). Hansen test results reveal whether the tool variables used for prediction are sufficient. The dynamic panel data prediction model results under GMM conditions should be tested with the first and second-order autocorrelation tests proposed by Arellano and Bond (1991). According to the results obtained, the second-order autocorrelation is expected to be statistically insignificant (Arellano, 2003, p. 121). In GMM studies, whether the model estimation is performed correctly or not can be examined with the Wald test, unlike the classical F test (Roodman, 2006, p. 35; as cited in İskenderoğlu, et al., 2012).

The first difference Generalized Method of Moments (GMM) (Arellano, Bond, 1991) used to capture the effect of lagged values. GMM's basic assumption is that the initial differences of instrumental variables are unrelated to fixed effects and allow the model to offer more tools and increase efficiency. Roodman (2006) stated that it is appropriate to use both difference and system GMM estimators when small T, large N panels, independent variables are not strictly exogenous and heteroskedasticity autocorrelation is present in the sample.

The research hypothesis of this study is established on the impact of financial integration on economic development. Gehringer (2013) stated that putting such a relationship in a static regression framework would significantly disadvantage, mainly referring to inherent problems. Individual country effects are necessarily associated with lagged dependent variables, resulting in inconsistencies in OLS and other static panel techniques (Baltagi, 2001).

The first difference generalized method of the moments model proposed by Arellano and Bond (1991) was applied to eliminate the problems mentioned above. This estimator has been used to deal with serious internality problems (Gehringer, 2013). The methodology involves taking the first differences of the equation at the level. This allows us to eliminate country-specific and time-invariant influences associated with current and past validations of explanatory variables. This model can express as follows (Gehringer, 2013, p. 298).

In the analysis phase of the study with GMM, the instrumental variables were determined as the explanatory variables' 1-term lagged values. Difference dynamics models are used to

eliminate individual (singular) effects. The empirical GMM model established to test the effect of financial integration and other macroeconomic variables on economic growth is as follows:

$$\Delta GDP_{it} = \beta_1 + (y-1)GDP_{i,\,t-1} + \beta'_2 \Delta IN_{i,\,t-1} + \beta'_3 \Delta OUT_{i,\,t-1} + \beta'_4 \Delta PRT_{i,\,t-1} + \beta'_5 \Delta INF_{i,\,t-1} + \beta'_6 \Delta CAB_{i,\,t-1} + \Delta\eta + \Delta\varepsilon_{it} \tag{1}$$

Here, when Δ expresses the first differences of variables, GDP_{it} gives the dependent variable (GDP per capita), and GDP_{it-1} gives the value of GDP_{it} with a period lag. $IN_{i,\,t-1}$, $OUT_{i,\,t-1}$ and $PRT_{i,\,t-1}$ give the financial integration variables, while $INF_{i,\,t-1}$ and $CAB_{i,\,t-1}$ give the one-period lagged values of the control variables. η is unobservable time-specific effects and ε_{it} is the country-specific error term. However, considering that the equation includes variables whose first differences in level are taken, country-specific effects are eliminated. (Gehringer, 2013, p. 298).

In the estimation procedure, explanatory variables were instrumented with their own lagged levels. The essential assumption involved in the model's creation and operation is that the country-specific term will not be associated in a serial sense in the original equation in the level values. Hansen J test and second-order serial correlation test of residues were performed to check the model's general validity (Gehringer, 2013, p. 298).

In this study, the relationship between GDP (economic growth) and financial integration investigated, the results of the estimation made with the two-stage GMM are shown in Table 1. It is formed in line with the expectations of the results. It is seen that direct foreign capital inflows to countries affect economic growth positively and significantly. However, direct net capital outflow affects economic growth negatively and significantly. It is seen that securities investments (portfolios) have a positive and significant effect on economic growth as indirect foreign capital investments. The inflation coefficient was included in the model as the control variable expected to be negative and statistically significant. This expectation has been met in the results. Moreover, the ratio of the current account balance to GDP, which expresses the sum of net exports of goods and services, net primary income, and net secondary income included in the model as another control variable, positively and significantly affects the economic growth. All these relationships are significant at the 1% significance level.

Lagging differences in explanatory variables are used as tools (instruments) variables in GMM estimation. Since the explanatory variable can be related to the error term, this problem can be solved using the explanatory variable as a tool. The efficiency of the GMM estimator depends on the validity of its tools. For this purpose, Hansen J-test results were used to question the validity of the tools. AR (1) and AR (2) tests are used to test the hypothesis of whether the error terms are serially related (i.e., whether there is autocorrelation between residues). The Wald test statistics show that all of the independent variables used in the model are significant in explaining the dependent variable.

As seen in the table, the GMM estimator is well modelled. The lagged coefficients of GDP per capita are statistically significant in the table and the Hansen J-test, which tests the instrument variables' validity, shows that the model's instrument variables are healthy. We used the Hansen test instead of the Sargan test to test the externality of instrumental variables because the Sargan test is not robust enough to detect heteroskedasticity and autocorrelation

(Roodman, 2006; Jang, Park, 2011). J-statistics, developed by Hansen (1982), expresses the GMM objective function's value using an efficient GMM estimator. The *J* statistic serves as a multipurpose test statistic to identify the faulty model. A large *J* statistic indicates an incorrectly defined model. However, the *J – statistic* on its own does not provide any information about how the model was misidentified. When the Hansen J test statistics are examined, the probability value is more significant than *0.05,* and the null hypothesis cannot reject. Therefore, the GMM estimator's results confirm the hypothesis that instrumental variables are not related to the set of residuals. Also, *AR (1)* autocorrelation test statistics are negative and significant, while *AR (2)* test statistics are insignificant. These results show that there is the first-order autocorrelation in the model, but not the second order.

Table 1

GMM Output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.865741	0.001609	538.1309	0.0000*
IN(-1)	0.000410	4.16E-05	9.846333	0.0000*
OUT(-1)	-0.000308	6.63E-05	-4.643045	0.0000*
PRT(-1)	0.000641	5.12E-05	12.52092	0.0000*
INF(-1)	-0.001288	6.09E-05	-21.14638	0.0000*
CAB(-1)	0.000545	0.000134	4.072514	0.0001*
Effects Specification				
Cross-section fixed (first differences)				
Mean dependent var	0.025257	S.D. dependent var		0.047609
SE of regression	0.051352	Sum squared resid		2.452461
J-statistic	54.97947	Instrument rank		53
Prob(J-statistic)	0.198085			
Test order	**m-Statistic**	**rho**	**SE(rho)**	**Prob.**
AR(1)	-5.411022	-0.716442	0.132404	0.0000*
AR(2)	-1.490655	-0.807938	0.542002	0.1361
Wald Test Statistics	**Value**	**df**		**Prob.**
F-statistic	1639.996	(5, 930)		0.0000*
Chi-square	8199.981	5		0.0000*

Note: GDP per capita is the dependent variable. Results are a two-step GMM estimator – one lag used as instrumental variables in the GMM method.
* Indicates significance at % 1. The Hansen J test shows the p-value for the null hypothesis of the validity of the instruments. AR (1) and AR (2) are the autocorrelated p-values of the error term for the first and second orders. These values indicate that there is no autocorrelation between residual values.

Quantile Regression Model (QRM) Approach

The quantile regression model was first put forward by Koenker and Bassett (1978) and attracted considerable attention both theoretically and empirically. In quantile regression models, the relationship between the quantiles of the dependent variable's distribution and the independent variables are presented in detail, with this structure, quantile regression is based on the minimization of asymmetric weighted absolute residual squares. Quantile regression offers an essential alternative to the conditional mean-based OLD regression, as it provides complete information on the distribution of the dependent variable. Laplace (1818) proved that the absolute deviation error estimator in the bivariate model has a smaller asymptotic variance than the EKK estimator under certain conditions, thus paving the way

for theoretical work for large sample estimators based on sample quantiles. Koenker and Bassett (1978) developed Laplace's (1818) invention. Here, they proposed a conditional quantile function model that allows estimation of the entire distribution of the dependent variable in their model, which they define as quantile regression (Saçıldı, Koşan, 2018, p. 189).

The median may become a more appropriate measure of central tendency when it comes to a skewed distribution. For this reason, conditional median regression was used instead of conditional average regression for modelling position shifts. Conditional-median regression was first proposed by Boscovich in the middle of the 18th century and then reconsidered by Laplace and Edgeworth. The median-regression model is for the problematic conditional mean estimates of the linear regression model (LRM). Median regression predicts a covariable effect on the conditional median, representing the central position even if the distribution is skewed (Hao, Naiman, 2007, p. 29).

Koenker and Bassett (1978) proposed the quantile regression model (QRM), a more general form than the median regression model, to model both position shifts and shapeshifts. QRM estimates the potential differential effect of a covariant on various quantities in the conditional distribution; for example, a sequence of 19 equidistant quantiles from .05th quant to .95th quantiles. With median and non-median quantities, these 19 fitted regression lines capture the displacement (median line), and scale and more complex shapeshift (lines for non-median quantities). In this way, QRM predicts the different effects of a covariate on the full distribution and accommodates different variances. Following Koenker and Bassett (1978), the QRM corresponding to LRM in equation two can express in equation three as follows (Hao, Naiman, 2007, p. 29):

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i \tag{2}$$

$$y_i = \beta_0^{(p)} + \beta_1^{(p)} x_i + \varepsilon_i^{(p)} \tag{3}$$

In this equation, *0<p<1* represents the population's proportion with scores below the quantile in *p*. Given x_i, denotes that the conditional quantile *pth* is $Q^{(p)}(y_i|x_i) = \beta_0^{(p)} + \beta_1^{(p)} x_i$. Therefore, the conditional quantile *pth* is determined by the quantile specific parameters, $\beta_0^{(p)}$, $\beta_1^{(p)}$ and a given value of the covariate x_i. ε_i shows the error terms. Since the $\beta_0^{(p)} + \beta_1^{(p)} x_i$ term is a constant, $Q^{(p)}(y_i|x_i) = \beta_0^{(p)} + \beta_1^{(p)} x_i + Q^{(p)}(\varepsilon_i)$. Thus, an equivalent QRM formulation requires that the *error term's pth quantile* be zero (Hao, Naiman, 2007, p. 29).

We can use quantile regression as a statistical method to estimate the conditional quantity function. The purpose of traditional regression analysis is to minimize the sum of squared errors (SSE). This method can express with the equation shown below (Yeh, 2014, p. 4):

$$SSE = \sum_{i=1}^{n} \left(Y_i - \hat{Y}_i\right)^2$$

However, in the quantile regression analysis, the aim is to minimize the "sum of weighted absolute errors" (SWAE):

$$SWAE = \theta \cdot \sum_{Y_i \geq \hat{Y}_i} \left| Y_i - \hat{Y}_i \right| + (1 - \theta) \cdot \sum_{Y_i < \hat{Y}_i} \left| Y_i - \hat{Y}_i \right|$$

Here, θ *illustrates the* quantile, which is *$0 < \theta < 1$. Y* is the actual value of the dependent variable. $\hat{Y} = \hat{\beta}X$ is the predictive value of the dependent variable. X = vector of independent variables, β = expresses the estimated values of the coefficient vector.

If a value of θ chosen, the coefficient vector can estimate by minimizing the above SWAE error function. For example, when = 0.5, the error's weight where the real value is greater than the predicted value will be 0.5, and the weight of the error where the real value is less than the predicted value will be 0.5. Therefore, the error function is neutral for two types of error. In other words, the probability that the real value is greater or less than the predicted value is all 0.5, and the predicted value is an estimate of the median (Yeh, 2014, p. 4).

In the next phase of the study, the quantile regression model (QRM) is used, which allows the financial integration growth relationship to evaluate according to economic growth levels. QRM is a statistical technique aimed at making inferences and measuring conditional quantile functions. This analysis is instrumental when conditional distribution does not have a standard shape, such as asymmetric, coarse-tailed, or dashed distribution.

Table 2 includes forecast results for the entire period, including the 25th with low and 75th quantile with high growth rates. In the table, when looking at the economic growth-foreign direct capital investment inflow (FDII) relationship, the impact of foreign direct capital inflow on GDP per capita is quite different between countries with low and high growth rates. Although positive and significant in both quantiles at the coefficients, we see that the FDII variable's coefficient in the 25th quantile is significantly higher than the coefficient in the 75th quantile. In other words, in countries with high economic growth rates, FDII's have significantly higher effects of economic growth than countries with low economic growth rates. This is because FDII's are generally turning to more reliable countries. On the other hand, one unit increase in FDIIs in the 75th quantile increases GDP approximately nine times.

From the perspective of foreign direct capital investment outs (FDIO), the variable in question on economic growth is similar in coefficients for countries with high and low growth rates but has a negative and meaningful effect. When looking at net portfolio indents, the coefficient in the 25th quantile (countries with low growth levels) is higher than the 75th quantile. Its impact on economic growth is positive and significant in both quantiles. The conclusion is that foreign portfolio investments are more important for countries with low growth levels than countries with high growth rates in economic growth.

The results also provide essential information in terms of control variables. The inflation control variable has no statistically significant economic growth effect for countries with high and moderate growth rates. In contrast, in countries with low growth rates, it significantly negatively affects growth. When we look at the balance of current transactions, there is a significant impact on economic growth compared to countries with high and low growth rates. Especially in countries with low growth rates and significantly driven by economic policies, the balance of current transactions supports growth.

Table 2

QRM Output

Variables	Quantile	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.250	0.974582	0.002942	331.2862	0.0000
	0.500	0.979501	0.002918	335.7202	0.0000
	0.750	0.973599	0.006827	142.6032	0.0000
IN(-1)	0.250	0.000181	3.76E-05	4.817523	0.0000
	0.500	0.000121	5.75E-05	2.098620	0.0361
	0.750	8.97E-05	3.95E-05	2.273780	0.0232
OUT(-1)	0.250	-0.000193	4.99E-05	-3.859718	0.0001
	0.500	-0.000107	0.000106	-1.014615	0.3105
	0.750	-0.000102	3.85E-05	-2.660475	0.0079
PRT(-1)	0.250	0.000958	0.000199	4.821828	0.0000
	0.500	0.000775	0.000186	4.160772	0.0000
	0.750	0.000535	0.000211	2.535211	0.0114
INF(-1)	0.250	-0.000213	7.89E-05	-2.694653	0.0072
	0.500	0.000534	0.000327	1.631048	0.1032
	0.750	0.000652	0.001185	0.550372	0.5822
CAB(-1)	0.250	0.001545	0.000345	4.484430	0.0000
	0.500	0.000631	0.000313	2.017575	0.0439
	0.750	-0.000741	0.000296	-2.499866	0.0126
C	0.250	0.103757	0.011825	8.774500	0.0000
	0.500	0.103583	0.012598	8.222088	0.0000
	0.750	0.154722	0.031889	4.851922	0.0000
Pseudo R^2	: 0.919732				

Conclusion

Considering the theoretical findings and suggested approaches, there are conflicting predictions about international financial integration and the effects of this process on growth. Considering the previous studies in the literature that can be regarded as fundamental studies on the subject, it is suggested that financial integration increases and facilitates the sharing of risk, along with some theories, thus improving specialization in production, capital distribution, and economic growth (Obstfeld, 1994; Acemoğlu, Zilibotti, 1997). In the standard neoclassical growth model, international financial integration facilitates capital-scarce countries' capital flow with positive output effects. On the other hand, financial integration can contribute positively to the intensification of competition with its growth effects and local financial systems' functioning through importing financial services (Klein, Olivei, 2000; Levine, 2001). However, there have been approaches that suggest that financial integration can retard growth. Boyd and Smith (1992) suggested that IFI in countries with weak institutions and policies (e.g., weak financial and legal systems) might cause capital outflow from countries with capital shortages to better institutions and capital-abundant countries. Therefore, some theories predict that international financial integration will only support growth in countries with strong institutions and good policies (Edison et al., 2002, p. 3).

This study aims to take a different approach by using two different panel data analysis methods to compare financial integration and economic growth. Although there have been discussions and many theoretical and empirical studies on this subject for many years, this is

still one of the controversial economic and financial issues. For this purpose, 52 countries were analyzed using GMM and QRM based on financial and economic data. Considering the results of this study, in line with the GMM analysis, direct foreign capital inflows positively affect economic growth, and direct net capital outflow negatively affects economic growth. On the other hand, portfolio investments have a positive effect on economic growth. While the inflation variable affects economic growth negatively, the current account balance affects economic growth positively.

According to the QRM analysis results, foreign direct investment (FDII) on GDP per capita differs in countries with low and high growth rates. In countries with high economic growth rates, the effect of FDIIs on economic growth is significantly higher than in countries with low economic growth rates. The reason for this may be that FDIIs generally head towards more reliable countries. On the other hand, foreign direct investment outflows have a negative impact on economic growth, regardless of the countries with high and low growth rates. The coefficient of net portfolio inflows is higher in countries with low growth levels than countries with high growth levels. Its effect on economic growth is positive in both quantiles. We concluded that foreign portfolio investments are more important for countries with low growth levels than countries with high growth rates in terms of economic growth.

On the other hand, the inflation control variable has no effect on economic growth in countries with high and medium growth rates. It negatively affects growth in countries with low growth rates. It has been observed that the current account balance has a significant impact on economic growth for countries with high and low growth rates. Especially in countries with low growth rates and economic policies that significantly drive economic growth, the current account balance has been found to support growth.

In summary, the phenomenon of financial integration has a significant impact on economic growth. This effect indicates a positive effect in general. In this context, this study's results are consistent with previous studies' findings in the literature. Findings from this study are in accordance with the findings of the studies conducted by Olofsdotter (1998), Borensztein et al. (1998), Reisen and Soto (2001), Bengoa and Sanchez-Robles (2003), Alfaro et al. (2004), Li and Liu (2005), Batten and Vo (2009), Soltani and Ochi (2012), Ameer and Xu (2017), and Bermejo Carbonell and Werner (2018).

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QUASI-RISK AND FRAUDULENT FINANCING MODELS: THE CASE OF FIRMS WITH NEGATIVE EQUITY IN UKRAINE[3]

In this paper, we aim to explore and explain the rise in the number and magnitude of negative balance equity (NBE) cases in Ukraine over the last decade. We systematize existing approaches to interpret NBE and scrutinize the interrelation between zombie firms and firms with NBE. We use an original database of 212 big Ukrainian firms to study basic dynamics of the number, volume and longevity of NBE cases in 2006-2019. Our findings indicate that a sufficiently large share of Ukrainian NBE cases does not appear to fully adhere to any of the existing hypotheses, and their number and longevity tend to be abnormally high. We offer two possible explanations for such a phenomenon. The first is a quasi-risk financing model, based on substituting equity with debt financing from associated firms usually registered in tax heavens. The second one is a fraudulent financing model, based on the exploitation of legal and political backing discrepancy between debtor and creditor. The use of said models is indicated by positive operational cash flow in conjunction with the continued business activity of NBE firms that otherwise qualify for bankruptcy. We suggest the Value Gap Ratio as a rule of thumb indication of these financing models being used.
Keywords: corporate finance; capital structure; net equity; bankruptcy; zombie firms
JEL: G32; G33

Introduction

Ukrainian economy appears to be relatively unique. It bears a strong similarity to a colonial economy with its resources being slowly drained by an outsider group, its people's interests being safely ignored and its laws being rather selective in their application. Unlike a typical colonial economy, however, the outsider group in question is not foreign in its origins or enforcement. In fact, the majority of country's resources are owned by local elites, in a

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fashion, similar to other post-soviet states. This peculiarity is reflected in the quality and availability of financial statistics and in apparent distortions in the logic of economic relations underneath it. One of the prominent examples of such breaches of economic logic would be an abundance of firms with negative balance equity (NBE) among Ukrainian firms. To reiterate, the ever-increasing number of NBE firms in Ukraine in conjunction with their illogically prolonged existence was neither properly detected nor researched before.

It is not typical for firms to have NBE for a number of reasons. For one, negative equity is generally linked to the firm's poor performance and thus is often expected to be an indicator of financial distress. Firms with NBE rarely exist for prolonged periods of time due to the loss of their creditor's trust, which usually results in the bankruptcy procedure. In the case of Ukrainian firms, this is not backed by factual evidence, however, for even though the NBE firms indeed tend to show poor performance, they also tend to exist in this state for decades, including 5 or more consecutive years of NBE. A similar pattern can be observed for so-called zombie firms, which are fairly described by Ahearne and Shinada (2005) as "highly inefficient and debt-ridden" firms, that receive financial aid predominantly from related banks. Similarities between the two include industry, performance issues and receiving loans from related parties, but the most prominent difference appears to be that Ukrainian NBE firms sometimes do not appear to show signs of distress, such as halting of production or downsizing.

Modern corporate finance provides a number of plausible explanations for this, most notably the non-recurring shock hypothesis (Ang, 2010) or "veiled value" hypothesis (Fairchild, 2018). And while some of the precedents fall within the boundaries of these interpretations, others still remain unexplained. For instance, the majority of Ukrainian NBE firms simply do not have enough intangibles in order to create any "veiled value", for most of them are old-fashioned heavy industry plants with little to no R&D going on. Moreover, real estate re-evaluation tends to be done on a yearly basis by most of the Ukrainian firms, leaving out the possibility of unaccounted for value growth. The non-recurrent shock hypothesis, on the other hand, predicts short periods of NBE superseded by a relatively fast and consistent return to normal, non-negative values, with no apparent loss of the firm's profitability. In Ukrainian practice, however, it is not uncommon for firms to effectively disregard their NBE, which is further reinforced by the lack of a functional stock market. To summarize, Ukrainian firms tend to show similarities with zombie firms, firms hit by a non-recurring shock, and firms with undervalued assets often without tangible evidence of having suffered any of these conditions. To reiterate, even though some western researchers have discovered similar trends over the world, the question of the rise in the number of NBE firms remains largely unexplored, and the existing explanations do not seem to be fully applicable to Ukrainian cases.

The thesis of this article is that willingness of Ukrainian creditors to continue their support of firms with abnormally long periods of NBE is not irrational. We see it as an indication of usage of what we call "quasi-risk financing model", which appeared as a response to the unstable macro-financial and institutional environment in Ukraine along with low levels of property rights protection. The gist of this model is that owners prefer to finance their firms not by official increase of registered capital, but by using quasi-loans, which are given to Ukrainian firms by business entities, registered in tax heavens and tend to have the same

owner as of the Ukrainian firm in question. Such practice essentially means that these business owners are not using loans at all, and therefore any assessment of credit risk of such firms must account for that by considering such loans hidden equity.

Thus, in this research, we aim to explore the hike in the number and magnitude of NBE cases in Ukraine and provide explanations for the irregularities and breaches of economic logic we encounter.

The object of this study is the relation between the negative equity of a firm and its survival prospects. The subject of this study is a set of NBE firms within the Ukrainian economy.

The tasks of the study can be formulated as follows:

1) to review recent literature on negative equity and its occurrences worldwide, hypotheses on its origins and impact;

2) to formulate the methodological framework to research and sample selection;

3) to make an overview of NBE cases in the Ukrainian industry, using available data;

4) to provide a detailed account on the most interesting cases of negative equity discovered;

5) to explain whatever deviations from the common practice we will be able to locate.

Literature Review

NBE in and of itself is by no means a new or unheard of occurrence. For the most part, such firms are being excluded from the economic research due to the additional difficulties they bring into any sort of value calculations. Many ratios are simply not designed to use near-zero or negative balance equity, and firms with such parameters normally are indeed a small minority.

Moreover, having NBE contradicts one of the basic assumptions of corporate finance theory, namely the maximization of the owner's wealth as the main objective of any business activity. NBE indicates that the owner lost all previously invested capital, since amounts of creditors' claims exceed total assets book value. Under such circumstances, creditors would try to rescue their investment by initiating bankruptcy procedure. As a result, the insolvent debtor loses control over his assets, which then are managed or sold by the appropriate authorities in order to ensure fair distribution of losses among creditors according to local legislation. Furthermore, under the assumption of creditors' rationality, initiating a bankruptcy procedure immediately after being informed about delays in payments is within their best interest.

According to Mayers (1984), a rationally acting firm would try to mitigate or avoid excessive costs caused by financial distress. The magnitude of such costs is determined mainly by an excessive debt burden, for only the creditors can initiate bankruptcy. The higher the probability of bankruptcy is, the lower would be the market value of the firm reflected in its book-to-market ratio. This ratio is higher for more heavily leveraged firms, as shown by Garlappi, L. & Yan, H. (2011).

Current methods of assessing risk of bankruptcy are generally a variation upon Altman's Z-score model, which made bankruptcy predictions based on firm's ROA, cumulative profitability, stability of earnings, capitalization, debt service, liquidity, and size (see Altman, Haldeman, Narayanan, 1997). The modern takes on the model usually focus on altering the weight or composition of aforementioned factors in order to adjust for changing global conditions (for instance, Naresh Kumar and Sree Hari Rao, 2015). Having NBE usually reflects capitalization, stability of earnings and cumulative profitability well within the boundaries that indicate imminent bankruptcy.

Thus, historically, the most common explanation for NBE would be, how Ang (2010) has put it, "persistent losses hypothesis". This assumption explains negative equity with chronic underperformance by the firm in question, which results in losses big enough to exceed firm's shareholders' equity, reducing it beneath zero in the consecutive period. Persistent losses hypothesis can be inferred to be used as an explanation for NBE by many classical researches, which use book equity-based performance metrics (for instance, Fama and French, 1992) as well as by some of the more conservative new works (for instance, Urionabarrenetxea, San-Jose and Retolaza, 2016). It is consistent with the traditional approach, which views negative equity as a last stepping stone before bankruptcy.

However, the «persistent losses hypothesis» says nothing about NBE cases of excessive duration. Traditionally, the prolonged existence of firms under financial distress is explained by the financial support of banks. Sustaining vitality of dead firms is an old idea about the preference of tradeoff between labour and efficiency resolving in favour of the first. These financial practices were investigated by R. I. McKinnon (1991), who made an important conclusion that crediting non-viable firms leads to capital misallocation in the economy. In more recent studies, cases of excessive NBE periods duration got a good explanation within the concept of so-called "zombie firms". They were first recorded during the 1990s crisis in Japan, but since then widely accepted to be relatively common worldwide (see, for instance, Ahearne and Shinada, 2005 or Caballero, Hoshi and Kashyap, 2008). The number of such firms appears to grow with each economic downturn, and not to shrink accordingly after the crises (Banerjee, Hoffman 2018). The practices of rolling-over distressed firms' debts spread widely along with the 2008-2009 crisis. Papworth (2013) explained the Britain's "productivity problem" partially by zombie firms' holding up capital and labour in relatively unproductive sectors, raising the costs of entry for new, innovative firms. It should be pointed out that not all zombie firms have NBE. Urionabarrenetxea, San-Jose, Retolaza (2016), referred to Cabballero (2008), pointed out that NBE firms are the *"most extreme type of zombie companies"*.

More recent studies tend to conclude that NBE by itself is not an indicator of firm's lacklustre performance. For instance, Ang (2010) conducts a study of a wide selection of stock exchange-listed firms from 1962 to 2006 and concludes that not all of the firms which show NBE are in financial distress, which he defines as firm either failing to repay its obligations or being delisted due to corporate failure. Ang explains this with the *"non-recurring shock hypothesis"*, which states that a number of non-recurring expenses and write-offs, suffered during specific activities like corporate restructuring or asset re-evaluations, could potentially drop book shareholders equity below zero without affecting production activity in any negative way. Therefore, the NBE firms that are not in financial distress are highly likely to

quickly regain positive book equity values. The non-recurring shock hypothesis assumes the NBE being covered by high returns in the future. We agree with Ang's (2015) conclusions that firms with NBE caused by a one-off negative shock should not have a high default risk or low survival rate. NBE does not necessarily mean an inability of financial recovering. The idea that firms with NBE are not financially distressed got a lot of empirical evidence. Mokrova and Zinecker (2016) empirical studies of manufacturing companies from the Czech Republic, Slovakia, Hungary, Poland and Germany for the 2006-2011 time period show that NBE is not a sign of a firm's bankruptcy or insolvency.

Fairchild (2018) reports, some of the better performing firms on the market (HP, McDonalds and Motorola, to name a few) appear to be content with NBE for prolonged periods of time. He explains it with firms having "veiled value" from undervalued intangible assets and real estate or lack of R&D capitalization. These firms are not risking the loss of their creditor's trust, and as long as they can reliably pay their current liabilities, they can afford to have negative book shareholders equity. Jan and Ou (2012) found NBE to result from accumulated R&D expenses over the years. This helps to explain NBE firms having a positive market value as also an ability to continue an activity for a long time. Some industries are more prone to such behaviour than the others – notably the ones with little need of tangible assets such as pharmaceutical or software companies, and as their number grew since the 1980s, so did the number of negative equity firms in general. Fraction of negative equity firms, listed on NYSE, AMEX and Nasdaq, reported by Ang (2010) for 1980-2006 was around 4%; he also states that there was little evidence of such firms before this period. A study of negative equity firms in Europe in 2009-2012, conducted by S. Urionabarrenetxea San-Jose and Retolaza (2016), concludes that the fraction of negative equity firms across Europe varies from 0 to 25% with an average of 6%. The fraction of negative equity PJSCs in Russia in 2009-2013 was reported by Grechenyuk, Grechenyuk and Sogacheva (2015) to be as high as 2.8% for PJSCs and 7.5% for PrJSCs. It is worth noting, that all these figures might not be directly comparable due to the differences in the selection and calculation methods, but all of them separately recognize the phenomenon of the growing number of NBE firms and its relative novelty. The latter means that such tendency is not covered by the more classic corporate finance researches written in the 1980s.

Researchers from the post-soviet countries appear to be less interested in the phenomenon of NBE than their western colleagues, even though this problem is more apparent for them. One of the main reasons for this is the aforementioned valuation complications, introduced by including NBE firms in the sample. Additionally, the very environment of a non-developed market introduces even more valuation problems. For instance, firms in post-soviet countries tend not to be traded on local stock exchanges, and hence feel no urge to maximize their stock worth by paying any dividends (Savchuk, Voloshchanyuk, Tereshchenko, 2019). This, incidentally, effectively excludes the dividend payouts as a likely reason of NBE for such firms. Local stock exchanges in post-soviet countries also tend to be effectively non-functional, providing no useful data on the market processes and housing little to no actual deals (Kerimov, 2019). The lack of need to maintain public image and virtually non-existent minor shareholders' property rights protection also allow for owner's income optimization strategies based on minimizing taxes by understating profits, which, in turn, tend to generate a sustained loss of equity capital over prolonged periods of time. Unsurprisingly, those researchers from post-soviet countries, who do mention NBE phenomenon, view it as an

exclusively negative occurrence and a sign of firm's total inaptitude or fraudulent nature (for instance, Abryutina, 2001, or Zemskov, 2008).

To summarize, there are currently three main approaches to interpret NBE. The persistent losses hypothesis explains NBE as a result of firm's chronic underperformance and views it strictly negatively. Non-western researchers tend to agree with such assessment, *making an emphasis on the high possibility of fraudulent nature of NBE firms,* due to the peculiarities of business practice in the post-soviet economies. The non-recurrent shock hypothesis views NBE as a neutral factor which is meaningless by itself and can occur in both prosperous and ruined firms, and therefore demands further investigation on an individual basis. The number of firms with NBE appears to be growing since the 1980s, and the firms, which naturally have less tangible equity, are more prone to having NBE. The veiled value hypothesis sees NBE as a result of failure on the part of modern accounting methods to accurately capitalize R&D and marketing expenses (Figure 1).

Figure 1

Causes for negative book equity
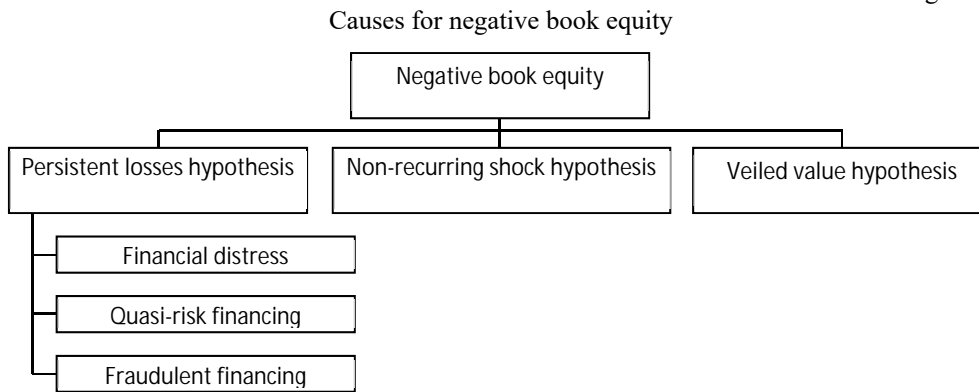
Source: author's generalization based on Ang (2015), Fairchild (2018), Jan and Ou (2012) and Zymovets (2019).

We add quasi-risk and fraudulent financing models as specific instances of persistent losses hypothesis. Unlike the original assumption used by Ang 2015, we believe that in some cases, the losses suffered by a firm are intentional and serve to avoid taxation, to minimize possible losses in case of a hostile takeover or to exploit vulnerable creditors.

The macro-financial consequences of the increasing number of NBE firms appear to be out of focus of the recent NBE studies. The impact of zombie firms, however, garners much more attention. Following Ahearne and Shinada's (2005) conclusions about the negative effects of higher zombie firms' concentrations on productivity growth, we can assume that increase of NBE firms' number has similar results. Caballero, Hoshi, and Kashyap (2008) showed zombies to crowd the market and that such congestion affects the healthy firms negatively. They predicted the prevalence of zombie firms to depress total productivity, since inefficient firms are preserved at the expense of potentially more productive newcomers.

While receiving financial resources directly from associated financial or non-financial entity might seem harmless, it has wider implications. Capital misallocation, caused by such practices, facilitates the "freezing" of valuable resources in the hands of businesses that are incapable of using them to their full potential. It is a consequence of all forms of sustaining non-viable firms, including NBE or zombie firms, which otherwise would fall to Schumpeter's creative destruction. If banks or other financial intermediaries engage in such practice, this appears to undermine R. Levine's (2004) idea of the positive impact of financial development on economic growth, specifically the assumption about more optimal allocation of financial resources via the financial sector.

Nevertheless, different cases of NBE have similar consequences for a financial system and economy as a whole. On the aggregate level, an increase of NBE firm's number results in the decline of the total equity of non-financial corporations, causing a debt burden on the sectoral level and upping systematic risk. NBE firms' proliferation negatively affects financial markets due to a decrease in the number of creditworthy borrowers, thus restraining capital reallocation and slowing economic growth. Therefore, the question of NBE firms is growing more significant, which calls for a solid classification of such cases. It stands to reason that a firm that has NBE due to an accounting quirk requires a vastly different approach in appraising and regulating than a firm, which uses underreporting its earnings for tax avoidance.

Methodology and Data

The usual practice is to assume NBE firms' recovery or liquidation within the normal period of up to three years. We assume that NBE cases, induced by financial distresses and one-off shocks, would indeed finalize over this normal period. Cases of NBE duration exceeding normal period, however, are considered to be a manifestation of foul play due to creditors' reluctance to withdraw debts. This reluctance may be intentional or forced.

Intentional reluctance to withdraw debts indicates the use of the *quasi-risk financing model* when creditors are associated with the firm's owners. It is a relatively common practice in Ukraine, when business owners withdraw cash from their firm registered in Ukraine as expenditures towards another of their firms registered off-shore, and then return said cash as quasi-loans from one of their off-shore firms. Usually, firms manage cash withdrawal using the tax avoidance procedures like causing artificial losses and liquidity gap covered by quasi-loans inflows from off-shore facilities and shadow economy (money laundering). Thus, in such a financing model, some debts are not real liabilities, but rather quasi-loans from related parties. We consider such quasi-loans to be hidden capital. Choice of the quasi-risk model may be forced by the poor institutional environment with weak protection of property rights. Using it allows to secure firm's assets against a hostile takeover by raiders as was pointed by Zwiebel (1996). The quasi-risk financing model echoes with the pecking-order theory's assumption about the avoidance of external sources of funding. Such form of business financing is typical for Ukraine and often includes the creation of artificial debts before associated companies (mainly registered off-shore) or other tax avoidance vehicles, as shown by Zymovets (2019). Such tax avoidance vehicles often take a form of a private joint-stock

company with little to no registered capital, no actual production or personnel, which officially buy and re-sell products from their affiliate creator firms, often at non-market prices. In this case, nothing restricts the duration of the NBE period until a firm's cash flow is enough to meet its obligations.

Forced reluctance to withdraw debts is often the case in a situation when a bigger firm refuses to pay off its accounts payable. It is mostly possible due to major discrepancies in legal position and political backing between debtor and creditor, which makes the debtor practically unable to initiate and manage bankruptcy proceedings against an insolvent NBE firm with better political and legal backing. In this case, we can conclude that the debtor firm uses a *fraudulent financing model*. The use of this model helps business owners to extract capital from weaker creditors, which are usually small and medium firms whose claims to the debtor are often less than the court costs would be, while their expected debt recovery rate is only around 9%, as opposed to 70,2% in OECD high-income countries, as is shown by World Bank's statistics. Final beneficiaries in the case often are owners of big enterprises, so-called «oligarchs». Their ability not to pay off debts allows them to manage the business with no equity at all. In the high inflation environment, the benefits of using such a model for the debtor are amplified by the fact that accounts payable do not involve any contractually fixed interest payments, while their value decreases drastically over time.

We chose to study NBE on Ukrainian data because we believe that some peculiarities (like tax-avoidance or controlled bankruptcies) are more pronounced in Ukraine due to more overt symbiosis between business, law-making, and law enforcement. It will hopefully allow us to fill the grey area of non-bona-fide instances of NBE and to produce tell-tale signs of such foul play.

For our research, we have gathered a small database of 212 Ukrainian firms. All of our data originates from open sources, such as the Stock Market Infrastructure Development Agency of Ukraine official website (smida.gov.ua), the sites of individual firms of the sample and a number of websites that aggregate open data on Ukrainian entities (youcontrol.com; opendatabot.com). The data on bankruptcy cases, which we included in this paper, was taken from the Unified State Court Decisions Registry (reyestr.court.gov.ua) on an individual case basis.

Information from periods before 2006 and after 2019 is not included due to its inconsistent availability. All the data is indicated for the beginning of the year. More details on our sample can be seen from Table 1.

Industries in the sample are grouped using the national Classification for Types of Economic Activities, which is a rough equivalent to ISIC Rev.4 classification used by, for instance, OECD statistics. The sample, as a whole, accounts for 16.8% of total aggregated revenue and 17.3% of total aggregated assets in the Ukrainian economy for the period. It is the most complete coverage one can reasonably achieve by using open-source data. Sample composition also indicates rather high levels of concentration of Ukrainian industry, most notably the coke and refined petroleum industry where 9 firms account for 73% of industry's revenue and 68% of industry's assets. Thus, any conclusions reached for a sub-sample with more than 20% of revenue and/or assets would be indicative for the corresponding Ukrainian industry.

Table 1

Ukrainian industrial enterprises sample parameters

Industry	ISIC Rev 4 Code	Number of firms in the sample	Portion of total industry revenue, covered by the sample, %	Portion of total industry assets, covered in the sample, %
Crop and animal production, hunting and related service activities	A01	17	31.59	20.83
Mining and quarrying	B	14	57.31	50.21
Food products manufacturing	C10	44	21.18	19.46
Coke and refined petroleum products manufacturing	C19	9	73.05	68.72
Chemicals and chemical products manufacturing	C20	9	41.39	37.05
Basic metals manufacturing	C24	15	76.83	37.05
Machinery and equipment manufacturing, including transport manufacturing	C26-30	41	30.98	36.28
Electricity, gas, steam and air conditioning supply	D35	16	55.64	56.92
Construction	F	24	4.71	4.53
Wholesale and retail trade, repair of motor vehicles and motorcycles	G	23	54.19	17.94
Total	-	212	-	-

Source: authors' calculations.

Portions of total industrial revenue and assets, shown in Table 1, are arithmetic means of corresponding portions, calculated for the 2013-2016 time period. The 2013-2016 time period for average values is chosen due to the availability of aggregated data, provided by the State Statistics Service of Ukraine in their "Activity of business entities" annual statistical publication. Since the Statistics Service constantly amends the structure of said publication, it is nigh impossible to form a consistent aggregated data time series.

To assess the scale and dynamics of the NBE in Ukraine, we calculate ratios using the data of NBE volumes on the firm level, number of NBE firms and compare obtained results with empirical observations of our predecessors. The study is built as follows.

1. We calculate the fraction of NBE firms in the sample and compare it to the percentage of NBE firms taken from other empirical studies. According to Ang (2015), about 4% of firms listed on NYSE/AMEX/Nasdaq have been reporting NBE since 1985. As pointed by Brown et al. (2008), the number of stocks with NBE increased to approximately 5% of all listed stocks since the late 1980s. Urionabarrenetxea, San-Jose, Retolaza (2016) estimated the average percentage of firms with NBE at 6% of their total number. We assume those rates are close to the «normal» NBE rate and exceeding it indicates the use of a quasi-risk or fraudulent financing model. We also check whether our NBE cases show signs of being zombie firms. For this, we define zombie firms as firms having three consecutive years of less-than-one interest coverage ratio (same as Banerjee and Hofmann, 2018). This allows us to obtain the percentage of NBE firms that have financial distress as zombie firms. Further comparison of the total NBE firms' number per industry

with the number of bankruptcies and number of zombie firms allows us to check the assumption about the use of quasi-risk or fraudulent financing.

2. We calculate the value gap ratio (VGR_A) on the aggregate sample level as total assets (A) divided on total liabilities (L) subtracted from 1.

$$VGR_A = (1 - A/L)$$

L – total assets of the sample

A – total liabilities of the sample

The ratio shows the percentage of liabilities not covered by assets at the level of the aggregate sample. An abnormal increase of VGR may be a sign of the quasi-risk/fraudulent financing spreading, which would require further study of VGR at the firm level confirm. On the firm level, we calculate the VGR_F ratio that shows creditors' percentage losses compared to their total claims.

$$VGR_F = (1 - A_{NBE}/L_{NBE})$$

L_{NBE} – liabilities of firms reporting NBE;

A_{NBE} – assets of firm reporting NBE.

We compare the median of VGR on the firm-level with empirical results by Ang (2015) about the median BE/TA (balance equity to total assets ratio) transforming BE/TA into VGR as following:

$$VGR = 1 - 1/(1 + BE/TA)$$

We presume that an abnormally high level of VGR may be a sign of an intentional substitution of equity by debts, i.e. of usage of quasi-risk or fraudulent financing model.

3. To identify atypical NBE cases of quasi-risk/fraudulent financing, we calculate the NBE durations on the firm level to compare with normal duration taken from Ang (2005) about the median NBE duration up to 3 years. If NBE duration exceeds this period, it may be an indication of quasi-risk or fraudulent financing model usage. We investigate whether bankruptcy proceedings were initiated against firms with an NBE duration of more than three years. Non-initiating of bankruptcy procedures confirms the use of a quasi-risk/fraudulent financing model.

Finally, we develop on the practical guidance to identify the abnormally high NBE levels, using deviations of actual NBE metrics from those, taken from empirical observations of previous papers about the subject.

4. In order to support our hypothesis of usage of quasi-risk/fraudulent financing models, we investigate the financial performance of NBE firms. For this purpose, we divide NBE firms into two groups: those that had NBE and went bankrupt and those that had NBE for 3 and more years, yet retained their operational activity. We include the results achieved by Altman, Haldeman, Narayanan (1977) as a general benchmark, but we only calculate some of the key indicators, for accessing the risk of bankruptcy among our sampled firms would be entirely different research. Namely, we include such indices: EBIT/TA

(Earnings Before Interest and Taxes/Total Assets, benchmark value – below -0,00555 for bankruptcy-prone firms), RE/TA (Retained Earnings/Total Assets, benchmark value – below -0,00066 for bankruptcy-prone firms), CF/TD (Cashflow/Total Debt, benchmark value – below -0,0173 for bankruptcy-prone firms) and NS/TA (Net Sales/Total Assets (1,312). Additionally, in order to illustrate the common practice of debt-paying among Ukrainian industrial firms, we provide average values of Days Payables Outstanding (benchmark – 60 days, after which it is legally possible to initiate bankruptcy) among the NBE firms. We expect that non-failed NBE firms should have better financials than bankrupted firms with NBE, and that both of them would have a legitimate cause to be proclaimed bankrupt. The continued existence of such firms we see as proof of their use of quasi-risk or fraudulent financing models.

Results

To assess the general dynamic of NBE firms' quantity, we calculate the fraction of them in the sample. We found the fraction having increased drastically over 2006-2019 from 4.3% to 18.9%, as can be seen from Figure 2. Up to 2010, the fraction was lower than 5% except for climbing in 2009 because of the financial crisis impact.

Figure 2

NBE firms' fraction in the sample over 2006-2019
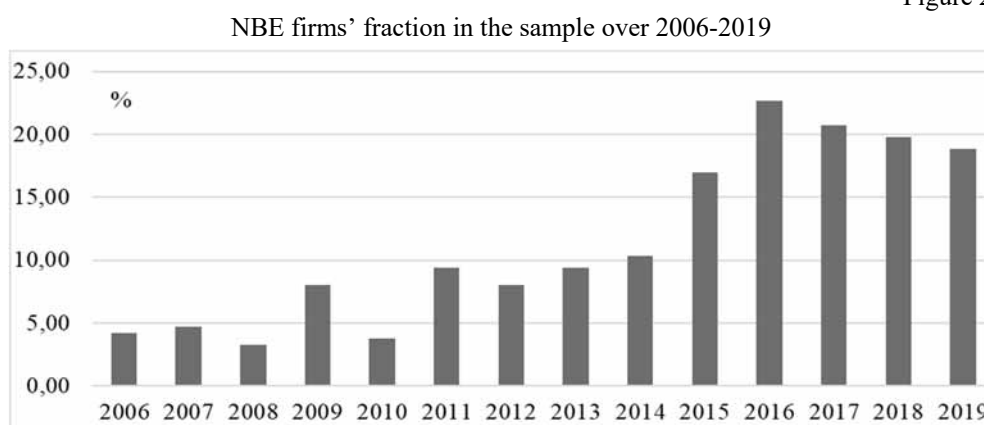
Source: financial reports of Ukrainian firms, www.smida.gov.ua.

Over 2010-2016, the actual NBE firms' fraction increased up to 22.6% that is substantially above its conditionally normal rate of 5%. The climbing of NBE firms' fractions may reflect the wider use of quasi-risk/fraudulent financing since 2010. In the meantime, we also do not exclude the impact of the financial crisis and other external shocks on the NBE firms' fraction increase. The yearly distribution of the NBE cases frequency shows their massive increase in 2014, which coincides with the beginning of the war with Russia. The majority of firms that got NBE in that period were the machinery producing firms that depended on Russian-made materials and the Russian market and had to re-establish their production chains according to the new situation (for details, see Annex 1). There was a much smaller hike in a number

of NBE firms after the economic crisis of 2008, caused by the plummeting of hryvna exchange rate and the discrepancy between the firm's income in hryvna and their debt payments in foreign currency. Most of the firms affected by it appear to be in trade, energy supply or food production – all of which depend heavily on imported materials and used borrowed money to acquire them. Hike in negative equity after 2011 mostly affected metallurgy and chemical products manufacturing, which is likely to be attributed to price changes on the global market. Trade, construction, mining and agricultural industries appear to consistently have NBE firms regardless of circumstances, i.e. zombie firms likely supported by quasi-risk financing.

To check the assumption about the spreading of quasi-risk financing, we compare the fraction of NBE firms in the sample to the fractions of bankruptcy cases and zombie firms in NBE firms (Table 2). A lower fraction of bankruptcies and a higher percentage of firms, classified as zombies, point to the usage of quasi-risk/fraudulent financing models. A zombie firm with NBE can only be viable due to external financial support from related banks.

Table 2

Fraction of NBE and bankrupted firms in the sample per industry, 2006-2019, %

Industry	NBE firms' fraction	Bankrupted firms' fraction	Zombie firms' fraction
Crop and animal production, hunting and related service activities	23.5	-	75.0
Mining and quarrying	21.4	-	33.3
Food products manufacturing	27.3	8.3	75.0
Coke and refined petroleum products manufacturing	33.3	-	66.7
Chemicals and chemical products manufacturing	66.7	-	100.0
Basic metals manufacturing	53.3	20.0	100.0
Machinery and equipment manufacturing, including transport manufacturing	34.2	28.9	71.4
Electricity, gas, steam and air conditioning supply	22.2	-	60.0
Construction	37.5	8.3	50.0
Wholesale and retail trade, repair of motor vehicles and motorcycles	39.1	25.0	66.7
Total NBE	34.9	16.2	71.6
Total sample	34.9	8.0	42.0

Source: authors' calculations.

As shown in Table 2, over 2006-2019, the fraction of NBE firms in the sample was 34.9%, which is considerably higher than the conditionally normal level of 5%. No industry has a percentage of NBE firms lower than 20%. It may point to the use of quasi-risk/fraudulent financing models over all industries. A substantially higher percentage of NBE firms was in the highly concentrated chemical industry (66.7%) and basic metals manufacturing (53.3%). The mining and quarrying industry, on the other hand, which is the third most concentrated industry in the sample, has the less NBE firms. We also observe a slightly higher than average percentage of NBE firms in less concentrated construction and trade. Therefore, there appears to be no clear relation between the level of concentration of industry and the fraction of NBE firms, even though it might have something to do with other attributes of the firms in question, for instance, their size.

The logical outcome of the poor performance of a firm is bankruptcy. Despite the high fraction of NBE firms in our sample, there aren't many actual bankruptcies, and the majority of them have been initiated only recently. Of the total number of NBE firms, only 8% underwent bankruptcy. It can mean that creditors were not willing to initiate bankruptcy procedures because of the many reasons inherent with quasi-risk methods of business financing. Being a zombie firm appears to be more closely related to the possibility of bankruptcy, with 82% of bankruptcy cases concerning such firms, although the latter could be the result of a much higher number of zombie firms in the sample. This may also mean that zombie firms in question have true liabilities, unlike other NBE firms that didn't undergo bankruptcy.

The small number of bankruptcies allows us to explore them on the case to case basis. Annexe 2 includes all of the bankruptcies in the sample, initiated from 2006 to 2020. The observed data makes it obvious that the absolute majority of firms that went bankrupt were subsidiaries of larger holdings, or, more precisely, financial-industrial groups (FIG). These huge conglomerates are often loosely connected and owned by a few or a single owner via a number of holdings registered off-shore (notably in Cyprus). As a general rule, such owners would-be oligarchs and members of Ukrainian parliament.

Half of the bankruptcies are not concluded, most of which are newly initiated. This allows to highlight the fact that the bankruptcy procedure in Ukraine lasts on average longer than a year. In such cases like Kreatyv PrJSC, Pervomayski MCC PrJSC, AvtoKRAZ PrJSC and Kvazar PJSC – much longer than a year. All of these cases included multiple appeals to cancel the bankruptcy procedure, which allowed to lengthen the corresponding procedures for multiple years. Around 1/3 of bankruptcy cases do not record NBE whatsoever. Most of such cases are swiftly concluded. Cases with NBE, record 5 years of NBE on average.

It is also worth noting, that around 30% of bankruptcy cases were initiated by a minor creditor with debt less than UAH 10 mln. This is unusual for the Ukrainian environment since the minor creditors that do not have a backing of a FIG would have been forced to withdraw their applications by the bigger creditors. This is mostly due to the low bankruptcy repayment rate (around 10%) and the fact that bigger creditors potentially lose much more than the smaller ones. This rule is broken, however, in the event of a hostile takeover or guided bankruptcy. For instance, a typical scheme used for a takeover in the sampled bankruptcies includes using an affiliated minor creditor to buy out debt from a minor creditor of a target firm and then immediately initiate bankruptcy procedure. Sometimes the procedure can be enhanced with bribing the target firm's management into wide cooperation and/or reinstating loyal managers via court. The latter is made possible by the peculiarities of the Ukrainian judiciary system.

Guided bankruptcies include deliberate misrepresentation of firm's financials by relocating parent firm's profitable activities to an often newly-created affiliated firm by "selling" its goods at unreasonably low prices or even giving goods away on the pretext of paying off similarly artificial debts for services. Thus, it is relatively safe to conclude that any judiciary active Ukrainian small firm is likely to be affiliated with one or bigger participants of the trial.

The study of bankruptcy cases shows that only about 8% of NBE firms went bankrupt over the regarded period. It means a majority of NBE firms managed to escape bankruptcy

procedures. While accessing the risk of bankruptcy of the sampled firms is not the focus of our research, our findings suggest that the percent of bankruptcies in the sample should be higher. The number of zombie firms indicates that 42% of sampled firms struggle with paying off debts for three or more consecutive years. Having prolonged periods of NBE for sampled firms indicates low returns on assets and inadequate cumulative profitability, and even without further calculation, it is clear that firms that are both zombie firms and have prolonged periods of NBE (of which there are 24.9% of the sample) would have a dangerously low Z-score and would likely to be considered bankrupt.

And while few NBE firms underwent bankruptcy, the majority of them (71.6%) show signs of being zombie firms (Table 2). The high fraction of zombie firms reflects the unwillingness by banks to initiate bankruptcy and liquidation procedures for NBE firms. Among many possible reasons for such seemingly irrational behaviour, we think that in the case of Ukraine, the most likely one is collusion between banks and borrowers. It is when banks and NBE firms shareowners, such financing schemes become not only possible, but usual. The unusually high percentage of zombie firms in an industry might coincide with higher levels of political and legal support for the firms that represent that industry.

To assess the overall spread of zombie firms, we calculated the fraction of them in the sample. Judging from the available statistics, one could conclude that Ukraine potentially has an above-average level of zombie firms per industry, for the normal share of such firms in 14 advanced economies, as reported by Banerjee and Hofmann (2018), was 12% in 2016. The average share of zombie firms across the main sample is almost 42%. Unlike these researchers, however, we disregarded the condition of the firm being over 10 years old due to local specifics. The absolute majority of zombie firms in the sample were registered in the late 1990s and at the beginning of 2000s, and at the most part, they were created by re-organizing former state enterprises. Therefore, even if they were not exactly 10 years old by the time they had their three consecutive years of less-than-one interest coverage ratio, they could hardly be considered "new" firms. The difference between shares of zombie firms may indicate the more widespread use of the quasi-risk financing model in Ukraine.

The increase of NBE firms' number impacts the financial system negatively because of upping the risks measured with the value gap ratio (VGR_A). As shown in Figure 3 up to 2014, the VGR_A was below 2%. It means that less than 2% of the total liabilities of the sample were not covered by assets. In further years, the VGR_A skyrocketed up to 11% at the beginning of 2019. We assume that if we are to include the SME's financial data, the VGR_A would be even higher due to the chronically worse financial performance of SMEs, as was pointed by Zymovets (2019).

To examine the NBE spreading inside the sample, we calculated VGR on the firm level (Annex 3). The breakdown of VGR into quartiles shows the increase in all of them. Over the whole period, the median VGR increased from 19 to 45%, surging after 2014. Over 2015-2019, the median VGR of the sample of 35.16% appears substantially higher than the conditionally normal VGR calculated from NE/BA data in Ang (2015) of 21.9%. We recognize the drop of equity below zero for many firms as a consequence of the sharp hryvna's depreciation over 2014-2016 set in motion by the annexation of Crimea and subsequent seizure of assets in both Crimea and Donbas by Russia. The abnormally high level of VGR may be a result of the reappreciation of debts to related parties, including banks,

nominated in foreign currencies. Therefore, the surge of VGR reflects the impact of worsening macro-financial conditions and the widespread use of the quasi-risk financing model on Ukrainian firms.

Figure 3

Value Gap Ratio (VGR), an average of sample of 212 Ukrainian firms
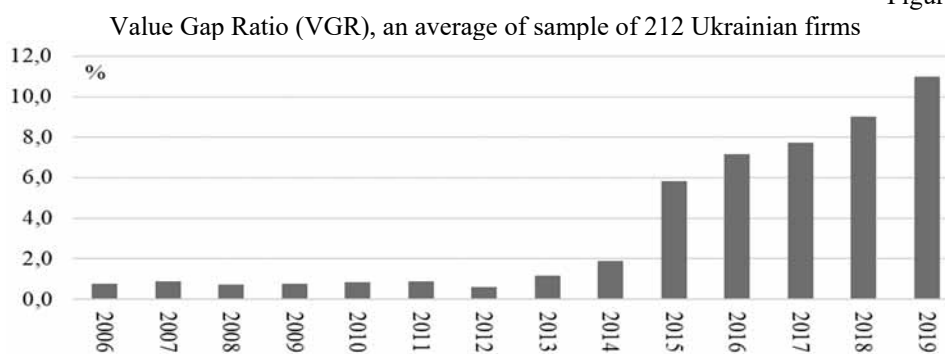
Source: Data of financial reports of 212 Ukrainian firms, www.smida.gov.ua.

Along with abnormally high VGR, the prolonged NBE duration also points to the use of quasi-risk and fraudulent financing models. To sort the NBE cases in line with typical ones, we calculated the actual NBE duration for every firm in the sample. We compared the results with the findings of Ang (2005) about median NBE duration up to 3 years. The exceeding of this period may mean the use of quasi-risk financing.

Table 3

Sample firms' NBE periods duration

Duration, years	NBE		Bankruptcy/termination	
	Cases	Fraction of main sample, %	Cases	Fraction of NBE cases , %
Total NBE	74	35	13	18
1 - 3 year	33	16	5	15
over 3 years	41	19	8	20

Source: financial reports and legal data of 212 Ukrainian firms over 2006-2019.

It is worth noting that almost 20% of the sample show prolonged periods of NBE, with relatively few of them (15%) ever facing the bankruptcy procedure. Moreover, the bankruptcy cases captured in the sample generally have one or more signs of fraudulent elements like abnormally long or short procedure duration, atypical initiating parties or collusions between debtors and creditors. NBE appears to be a minor factor in the bankruptcies of the sample's firms.

Due to the quality of available data (specifically, abundance of periods when some of the firms of the sample did not provide their financial statements), it is likely the number of NBE periods is higher as is their median longevity. With the amount of NBE firms being abnormally high as is, it indicates strongly towards our hypothesis that there are specific quasi-risk and fraudulent models of financing used by Ukrainian firms.

Table 4

Select financials for NBE firms, 2006-2019

	EBIT/TA	RE/TA	CF/TD	Days Payables Outstanding	NS/TA
Benchmark	-0,00555	-0,00066	-0,0173	60	1,312
Bankrupted NBE firms					
1q	-0,19093	-1,33152	-0,00102	18710,1	0,005
2q	-0,07536	-1,03968	0,00440	132,4	0,190
3q	0,00000	-0,70433	0,02611	31,1	1,420
4q	0,09659	-0,44410	0,10447	5,1	2,005
Firms with 3 or more years of NBE					
1q	-0,05311	-1,19914	-0,02109	3223,3	0,322
2q	0,00391	-0,69985	0,01192	199,6	0,849
3q	0,03772	-0,29947	0,03808	76,6	1,321
4q	0,44793	-0,05322	0,83187	20,9	20,430

Source: financial reports and legal data of 74 NBE firms over 2006-2019.

As can be seen from Table 4, the average financials of bankrupted NBE firms are indeed worse than those of non-bankrupted NBE firms, mostly due to the worst cases weighting them down considerably. However, even the non-bankrupt NBE firms show an immense delay in repaying their debts (3 or more times the limit that allows creditors to initiate bankruptcy), and thus their continued existence could only indicate that their creditors are somehow content with such a state of affairs. Moreover, both bankrupted and non-bankrupted NBE firms show clearly worse RE/TA ratio than the bankrupted firms in the sample provided by Altman, Haldeman and Narayanan (1977), which indicates that in normal circumstances, all of them would be considered prone to bankruptcy. However, slightly positive median EBIT/TA of NBE firms that did not undergo bankruptcy procedure in conjunction with their above-zero median CF/TD imply that most of these firms have enough cash flow to continue the operational activity. This supports our hypothesis of Ukrainian NBE firms surviving due to the usage of quasi-risk or fraudulent financing models.

Conclusions

The fraction of NBE firms in Ukraine demonstrates a fast increase over 2006-2019 up to 18%, which is substantially higher than its conditionally normal level of 5%. This exacerbates financial risks due to an increase in value gap ratio (VGR) calculated as the percentage of creditors' claims not covered by available assets. The abnormally high VGR on the firm level in Ukraine appears to be a strong argument for the quasi-risk financing spreading over the last decade, i.e. business financing through quasi-loans granted by related parties, including ones registered off-shore. The other model, which we define as a fraudulent financing model, is used to extract capital from the weaker creditors by exploiting their lack of legal and institutional backing. Both of the models are actively used in tax avoidance. Since the majority of big industrial enterprises, if not all of them, are both owned by oligarchs via their vastly profitable financial-industrial groups and have continued functioning in NBE-state for years, it is quite likely that their losses are deliberate. Such state may be used in order to optimize taxation (i.e. avoid paying taxes in Ukraine) while using enterprises' protected state

(for most of them are unique providers of their goods in Ukraine) to continue generating profits, that are redirected to tax heavens via a number of schemes, like lending by captive institutions.

Generally, the quasi-risk and fraudulent financing models should be considered within the frame of two existing approaches – the «persistent losses hypothesis» (although remarking that the losses are deliberately created) and the concept of zombie firms. External shocks (war with Russia and related capital outflows) seem to exacerbate the NBE volumes because of substantial debts outstanding, nominated in foreign currency, on the background hryvnia depreciation. Therefore, we can relatively safely assume that the number of NBE firms partly may result from external shocks.

The assumption about the quasi-risk/fraudulent financing model usage is further confirmed by the abnormally long NBE periods observed across Ukrainian firms suggesting the strange vitality of them. The average length of the consecutive NBE period of the enterprises of the sample is 4 years and more, up to 12 consecutive years. The NBE firms have the ability to survive for long periods because of the creditors' reluctance to initiate bankruptcy procedures. Bankruptcy procedures were initiated only against 20% of firms having an NBE duration of more than three years. Moreover, with a decent probability, we can conclude that most of the bankruptcies analyzed were not driven by the firm's bad performance, but by other motives, most of which were connected to abusing bankruptcy procedure in order to write off debts, establish control over the firm or to deny another party a possibility to acquire the firm.

Based on the research made, it is possible to formulate the following hypothesis. A weak institutional environment and high systematic risks push businesses in Ukraine to find safer than traditional models of financing. Therefore, businesses choose the quasi-risk financing model in which their deliberate losses create abnormally long periods of NBE. The lack of equity is substituted with B2B lending from related parties. The manifestation of this phenomenon is the abnormally high duration of the non-financial current liabilities turnover period allowing to maintain the positive cash flow of the firm for a long time. Unless creditors seek redemption they are considered to be related parties with full direct or shadow control over the firm. At the same time, fraudulent financing model have spread, which is based on non-return of funds to weaker counterparties. This hypothesis is likely to be universally applicable.

We believe that the NBE cases highlighted in this article are not unique for Ukraine or countries with weaker institutions or legal environment. And while the fraudulent financing model is hard to use in countries with a developed legal environment, the quasi-risk financing model is used to an extent by most of the multinational corporations for tax avoidance. And while the Ukraine's example shows more crude and obvious patterns of such behaviour, the framework used to explore it is potentially useful for other countries.

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Annex 1

NBE firms' frequency (percentage of total number) across industries

Industry	Section	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Crop and animal production, hunting and related service activities	A01	0.0	0.0	0.0	0.0	0.0	11.8	11.8	5.9	5.9	11.8	17.7	11.8	11.8	11.8
Mining and quarrying	B	0.1	7.1	7.1	7.1	7.1	7.1	0.0	0.0	0.0	0.0	7.1	7.1	0.0	0.0
Food products manufacturing	C10	0.0	2.3	0.0	6.8	2.3	6.8	4.6	4.6	0.0	6.8	18.2	20.5	15.9	15.9
Coke and refined petroleum products manufacturing	C19	0.0	0.0	0.0	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	22.2	33.3
Chemicals and chemical products manufacturing	C20	0.0	0.0	0.0	0.0	0.0	22.2	22.2	33.3	55.6	55.6	66.7	66.7	66.7	66.7
Basic metals manufacturing	C24	13.3	0.0	0.0	0.0	0.0	0.0	13.3	20.0	26.7	40.0	46.7	33.3	40.0	26.7
Machinery and equipment manufacturing, including transport manufacturing	C26-30	0.0	2.4	0.0	2.4	4.9	7.3	4.9	7.3	7.3	17.1	24.4	26.8	22.0	22.0
Electricity, gas, steam and air conditioning supply	D35	18.8	18.8	25.0	25.0	6.3	6.3	0.0	0.0	0.0	0.0	6.3	6.3	6.3	6.3
Construction	F	0.0	8.3	8.3	8.3	4.2	12.5	8.3	8.3	16.7	20.8	16.7	20.8	20.8	20.8
Wholesale and retail trade, repair of motor vehicles and motorcycles	G	4.4	8.7	0.0	21.7	4.4	17.4	17.4	21.7	17.4	30.4	30.4	13.0	17.4	13.0
Total sample			4.3	4.7	3.3	8.0	3.8	9.4	8.0	9.4	10.4	17.0	22.6	20.8	19.8	18.9

Data from the firms' financial statements at the beginning of the year. Database available from:
https://drive.google.com/file/d/1A92fHlbty5I9OslYkc7Szx8RCciPxljj/view?usp=sharing

Annex 2

Bankruptcies in the sample

№	Name	ISIC	Affiliation with FIG	Negative equity periods	Case initiated	Initiator	Case concluded
1	PrJSC Kreatyv	C10	Yes	2015-2018	06.06.2016	Self-initiated	16.04.2018
2	PrJSC "Pervomayskiy MCC"	C10	Yes	-	12.07.2016	Creditor	In progress
3	PrJSC "Rosava"	C19	Yes	-	15.11.2018	Self-initiated	04.12.2018
4	PJSC DMK	C24	Yes	2012-2018	31.05.2019	Minor Creditor	In progress
5	PrJSC YENAKIIEVE STEEL	C24	Yes	2018	01.07.2019	Minor Creditor	In progress
6	PJSC Cominmet	C25	Yes	2012-2016	05.09.2017	Self-initiated	26.09.2017
7	PrJSC AutoKRAZ	C26-30	Yes	-	24.09.2018	Creditor	In progress
8	PrJSC ZTR	C26-30	Yes	2015-2018	17.10.2019	Self-initiated	In progress
9	PJSC "Druzhkivka Machine-building plant"	C26-30	Yes	-	17.12.2019	Creditor	17.12.2019
10	PJSC Kvazar	C26-30	Yes	2016-2018	06.03.2019	Creditor	In progress
11	PJSC Borex	C26-30	No	-	25.09.2018	Self-initiated	02.10.2018
12	PJSC SumyKhimProm	C26-30	No	2010-2018	24.10.2011	Creditor	30.10.2012
13	PJSC KHSP	C26-30	Yes	2015-2018	04.08.2014	Minor Creditor	19.08.2016
14	PJSC Trust Kyivmiskbud-3	F	No	2017-2018	26.06.2019	Creditor	In progress
15	PrSC HBC №3	F	No	2018	31.07.2019	Creditor	In progress
16	LLC Evrotek RC	G	Yes	2013-2016	31.01.2019	Minor Creditor	20.06.2019
17	PrSC Carlo Pazolini Trading	G	No	2009-2016	07.07.2016	Minor creditor	25.10.2016

Annex 3

Value Gap Ratio (VGR) on the firm level of the main sample (212 firms)
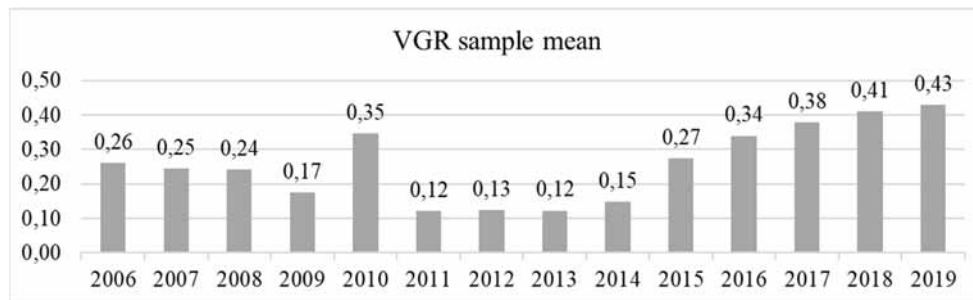
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mean	0.26	0.25	0.24	0.17	0.35	0.12	0.13	0.12	0.15	0.27	0.34	0.38	0.41	0.43
1q	0.08	0.10	0.06	0.09	0.12	0.02	0.07	0.05	0.04	0.11	0.17	0.16	0.21	0.20
2q	0.19	0.14	0.10	0.10	0.20	0.10	0.12	0.11	0.10	0.27	0.33	0.34	0.39	0.45
3q	0.41	0.31	0.31	0.16	0.36	0.18	0.18	0.19	0.25	0.38	0.51	0.54	0.57	0.64
4q	0.63	0.63	0.81	0.84	1.00	0.35	0.29	0.28	0.46	0.74	0.93	0.89	0.91	0.91
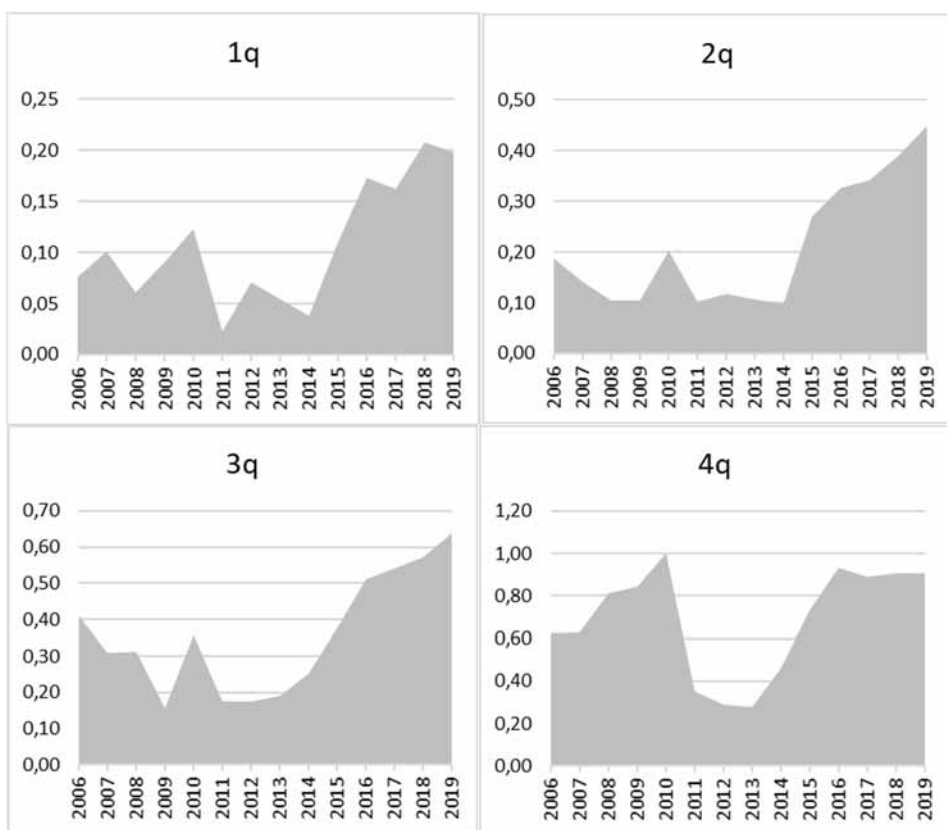
Charbel El Ammar[1]

TALENT MANAGEMENT PHILOSOPHY IN PUBLIC SECTOR: A KEY FOR MANAGING CONFLICTS AND CONTRADICTIONS[2]

Nowadays, economic globalisation has developed an increasingly challenging and competitive market environment that many firms should adapt to perform adequately in order to ensure profitability, sustainability, and economic development. Workers across the globe are becoming bigger, diversified, further cultured, and dynamic. A substantial existing proof demonstrates that firms around the world experience a powerful challenging situation concerning talent. Attracting, developing, and keeping highly talent individual is considered critical in private and public sector. These sectors are faced with condensing talent competitiveness between each other. Yet, talent management is an understudied area of discussion in public organisations. The objective of this article is to define and describe talent management based on a public sector framework through placing it within the human resource management system and relating it to developments, improvements, and trends of the public sector. This paper employs a comprehensive approach for talent management drawing on experiences based on public management and administration, and human resource management. Firstly, this paper identifies features and improvements related to the public industry. Second, it describes and defines talent and talent management from public perspectives focusing on recent studies and publications; it analyses talent management major problems, internal and external influences, conflicts, and contradictions in the public sector. Lastly, this paper recommends a potential road map for the research and discussion of talent management in the public industry and raise several suggestions for future studies.
Keywords: Public Sector; Public Administration; Talent Management; Public Management; Human Resource Management
JEL: H83; M12; O15

Introduction

The fierce competition that hits the global market and economy represents a critical path for organisations performance to adopt talent management. The major obstacles and challenges in managing organisational workers are to build and maintain the potential and opportunity for organisations for a talent competition. Management of talent is dynamic and affected by

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environmental elements like global development, mergers and acquisitions, economic growth, and sustainability. Talent management (TM) is a pivotal element of modern economic development because it permits companies to attract and keep the best and superior talent while raising production efficiency and effectiveness. In early 1990, the notion of TM was a method to make sure that companies and organisations have skilled and creative persons, in other words talented individuals. Today, TM is known as an essential resourcing and wealthy tasks (Armstrong, 2009). The introduction and execution of TM strategy seek superior qualified managers and leaders from upper level, executives, and human resource management (HRM) (Younger, Small Wood, & Ulvich, 2007). The concepts of TM, performance and quality management (Girneata et al., 2015; Dobrin et al., 2015), and evolution of leadership are common for corporations in private industry (Stahl, Bjorkman, & Farndale, 2012). Both performance and leadership have discovered the road toward public industry and studies (Van Dooren, Bouckaert, & Halligan, 2015). In public industry or sector, TM is in the context of exploration and still incomplete and need more investigation in this area of study (Gallardo & Thunnissen, 2016). However, in concept and execution, TM probably appears as the main source of focus and concern in the long run. This article is extremely concentrated and based on the importance of context. Particularly, in TM studies and scholarly works, focusing on the effect of organisational structure and context, employees and staff qualification and traits based on TM are quite poor (Collings, 2014). The article purpose is: first of all, to identify TM in public sector setting by placing it within the scope of HRM in the public sector; second relating and connecting TM to improvements and trends in the public sector attempting to address certain main problems, complexities, conflicts, and contradictions concerning TM in public industry. Finally, we discuss potential and future study and certain functional implementations. In order to accomplish such objectives, the paper employs TM comprehensive approach drawing on experiences based on public management and administration, and HRM.

1. Theoretical Concept: Human Resource Management in Public Sector

Throughout history, public sector circumstances have been complicated, due to the substantial influence of organisational processes and it is frequently powerful than from the private sector (Christensen, Laegrid, Roness, & Rovik, 2007). Public sector background is distinguished by problems of governance, existence and effect of several stakeholders within and around public service entities, governmental functions, significance of political life, effect of organisations and culture-related public beliefs and values, and occupations of specialists and experts in serving the public like tribunal judges, doctors and professionals in the health care centre, and instructors in schools and public universities teaching (Leisink, Boselie, Van Bottenburg, & Hosking, 2013). Due to such reasons, the public industry is a varied and diversified sector. It doesn't exist just one context, background, or history for the public sector despite the fact that important correspondence appears in the various public sectors, such as in educational services and medical services. Furthermore, the evolution of New Public Management (NPM) along with ownership and service transformations from government and public to the private sector resulted in the shifting of certain public institutions such as the aviation sector to be tightly attached to private companies. In addition,

there are disparities and variation among nations that will ultimately lead to distinctions in organisations, political situations, culture, rules, and regulations. To summarise, entities in the public industry are overwhelmingly distinct from those in a private one. Eventually, due to macroeconomic gaps, there are big holes among public service entities. Organisational elements influence specific principles of the organisation, like the theory of organisation and employee performance, the idea of personal encouragement and commitment, and the road toward public institutions and human resource management. Some researchers incorporated public management and administration perspectives and HRM philosophy (Vandenabeele, Leisink, & Knies, 2013) within the value-added chain of human resources (Wright & Nishii, 2013). (Figure 1). Vandenabeele et al.'s framework presented in 2013 varies from Wright and Nishii one in the same year because it provides an overall context of the human resource life cycle and involves a variety of functions, which are considered helpful in understanding HRM and TM nature in the various settings of the public sector.

Figure 1

Integrated Framework of Public Management and Administration perspectives and HRM process
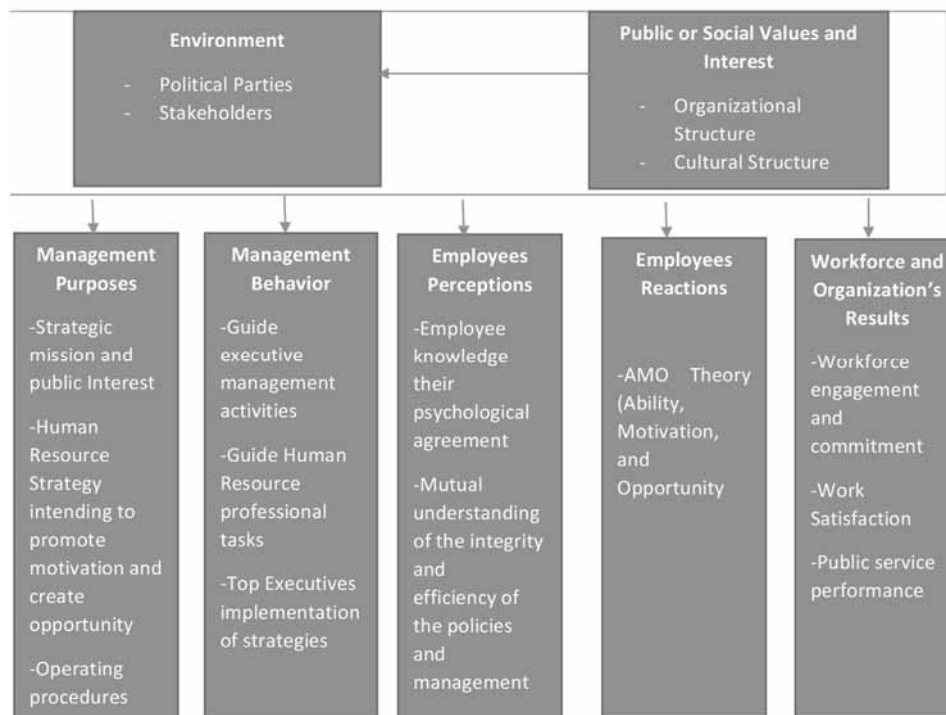
Source: (Vandenabeele, Leisink, & Knies, 2013) Creation of Public Value.

In its top half, the framework shows the immediate and ongoing effect of the elements of the contexts that introduce and adopt HR processes on public institutions. Vandenabeele and

workmate provide and offer a differentiation between the value and beliefs of the public and the authorising environment. The latter includes the effect of policymakers or political individuals and stakeholders. Government strategy planners, politicians, employers, audit departments and government consultancy councils, and further administrators and public sector employees inside the organisation are an example of stakeholders that exists both inside the organisation and outside. Public beliefs and values contribute to public sector commitment toward the community, such as sustainable development, social responsibility, and economic and political stability, in addition to the way public institutions and public workers must act and operate in the public setting and environment like political leaders and residents that referred to standards for example commitment, responsibility, transparency and trust (Jorgensen & Bozeman, 2007).

The present and current organisational and cultural context defines and describes public values. The second half of the framework is oriented toward HRM cycle. Concerning employees' reactions to HR application procedures, the framework is tailored to the unique features, traits, and qualities of public sector employees. It contains perspectives and observations based on abilities, motivation, and opportunity (AMO) of public workers to engage and participate, particularly, the motivation that is considered convenient and suitable to the commonly discussed principle of PSM public service motivation in the public sector (Vandenabeele & Perry, 2015). PSM represents a special model of workforce engagement, encouragement, and satisfaction in relation to public industry.

We consider that the awareness of the significance of human resources management to the overall health of an organisation has increased significantly in recent years. This awareness of HRM's impact extends to both public and private organisations as they often face problems with staff management that can have a decisive effect on business performance.

2. Attributes and Evolution in Public Sector

To better understand the contextual debate on TM, three interesting attributes of public service entities are taken into consideration and must be put emphasis on. Firstly, throughout several nations and traditional history, government represents the perfect employer, placing the welfare of workforce at the centre point with regard to job protection, salary and compensation, and growth; resulting in organisation future career and profession (Baron & Kreps, 1999). Being a good or perfect employer, the government's goal isn't to develop a strategy for its institutions and entities, yet, it has widely turned into the existing path and breathe for organisations in public industry.

The uncertainty and doubt whether such baseline could be retained taken into account the required institutional employment ability concept and flexibility is still under question. Secondly, based on powerful legacy, several public entities employ the concept of equality, stating that employees, as a whole, are equivalent and must be served and handled to the most extent they can (Boselie, Leisink, & Vandenabeele, 2011). Trying to adapt such an idea within any organisational structure means that all workers will have equivalent opportunities for development and growth, including a fair chance for promotion. This drops out limited scope for differentiation and also contributes to further processes, like different chances and

potentials for internally and externally complaint processes, for e.g., labourers or workforce who do not obtain a raise, bonus, or promotion can submit a written complaint or claim against the public entity. Thirdly, many governmental institutions have unique regulations for government officials and workers, varying from highest employment level, job security, and protection to a special tribunal for army forces staff sector (Leisink, Boselie, Van Bottenburg, & Hosking, 2013). This implies that it is much harder and complex for public entities to fire workers than it is for private entities.

However, there are also professional agencies and associations associated with highly qualified people employed in a public institution, for e.g., physicians, doctors and other healthcare providers, judges, scholars, and scientists who set professional quality requirements, offer continuous improvement, and even they possess special laws. Most occupations are constitutionally regulated and thus strongly organised. The organisations can't fully regulate the socialisation and growth of public employees. However, it is also in control by outer and foreign institutions or structures. Those three Government sector features are under tension and thus evolving. Many states confront government minimisation and reduction in many public services, mostly associated with the 2008 worldwide financial crisis (Vos, Boselie, Brewster , & Vos, 2013). These adjustments could be, specifically, governmental in public industry, or in the country in general. To illustrate this, the medical service faces critical efforts and challenges, taking into consideration the rising value and price of such service and the resident's age issue.

For certain nations, budgetary and financial plans for army forces are decreased as a consequence of political intervention and public perception, while in many other nations, due to the acts of terrorism or armed conflict, this financial service plan is raised. Also, aside from the fiscal reductions, there is a trend in several Western nations to minimise government scale and public service institutions toward further private contract and outsourcing and reduction in governmental services resulted in minimising the overall workforce number in the public sector. Improvement in the volume of workers under flexible contractual process along with a reduction in fixed employment are critical objectives toward increasing the stability and resilience of the organisation (Boselie & Thunnissen, 2017). Furthermore, in light of the above argument, the concept of NPM emerged as a key player on enhancing efficiency, effectiveness, performance, transparency, and responsibility in public institutions. NPM dominates both administrative and organisational performance reasoning (Noordegraaf, 2015).

Due to NPM several private business strategies have discovered their path to public entities, like lean and performance (Van Den Brink, Fruytier, & Thunnissen, 2013). In addition, the growing pressure from the community on governmental agencies in order to be accountable and legitimate towards the society requires a socially responsible stand from these agencies, such as senior executives' salaries, bonuses, incentives, compensation, and government expenditures (Vos, Boselie, Brewster , & Vos, 2013). Governmental entities faced a great challenge and pressure in order to provide residents and consumers with better value and significance for money and to extend them with public services efficiently and effectively.

3. Motivational Aspects for Public Sector Function

While certain researchers argue that the public or governmental sector is not considered desirable, many employees throughout this sector, when they serve and operate within it doesn't demonstrate any desire or interest in leaving their jobs (Swailes & Orr, 2008). In Germany, for e.g., less than 33% of public workers tend to be searching for better work or employment showing a clear and particular priority within or in other public institutions (Swailes & Orr, 2008). The propensity to move or seek another employment and jobs often declines dramatically after age 35 (Ministry of Interior and Kingdom Relations, 2015).

Why should individuals want a career or employment in the public field? What are the motives that keep and retain them? Scholars conducted a comparative analysis across several countries, they found that the traits of human beings represent a significant and influential factor for a job in the public domain rather than job market trends at a national level and standard (Van de Walle, Steijn, & Jilke, 2015). Working in the public domain is considered a priority and favourable over other sectors because it provides a future employment and life career structure, that offers greater and superior safety and protection, rather than a situation-based structure. Based on the most recent analysis of Van der Walle et al. (2015), government earnings, economic instability and the rate of unemployment in a country indicate a lower to null effect.

External motivation (EM) and PSM, both are considered essential and desirable factors for an employment in the public domain, basically on the people level (Van de Walle, Steijn, & Jilke, 2015). EM has to do and is associated with employment protection, financial stability and safety, and development opportunities. PSM means that individuals are drawn and motivated for an employment in the public field due to their need for contributing in the community and public benefit. Those who appreciate fundamental work qualities and characteristics, such as an enjoyable and independent job, leisure, gratification, and entertainment, are showing more desire and interest for a position in a private or corporate domain. Thus, researchers end up with two kinds of employees concerned with the public job; the inactive or lazy and the devoted or dedicated.

Because this article is based on TM, we choose to concentrate on the dedicated employees of the public sector and to take further concern about the notion of PSM. This latter could be defined as valuable principles, believes, and behaviours that run behind and further away from beyond selfishness and institutional benefit, which involve the desires of a broader political body, and which inspire and encourage people to behave correspondingly whenever necessary (Vandenabeele, 2007). PMS related-values differ between sub-sectors (Van Loon, 2015). Van Loon (2015) offers a difference regarding providing services between individual shift and transformation of values and individual treatment and development. Providing services based on individual transformation and shift frequently concentrate on helping them to improve and adapt, for example, public education experts, medical professionals, and jails specialists. Such workers have to connect with their end-users, such as, students, sufferers, and prisoners, to realise the way to improve them, thus, strive to promote effective motivations. Contrarily, providing services based on an individual's development cope with consumers of all types and just only improve their position or destination. These involve a municipal government and policemen. Workers in such a process overwhelmingly assign

greater value and importance moral and ethical motivations, for example, responsibility toward community value by the national government through democratic promotion and cautions, and a sense toward the call of duty and commitment by fighting illegal and inequity acts through law enforcement and security forces.

Employment that probably offers a chance to fulfil PSM will result in greater and satisfying work, institutional engagement and dedication, people performance and achievements, and reduce rotation and determination to move (Hondeghem, Perry, & Wise , 2010). Performance and PSM's correlation are notably proven for occupations with strong perception and potential social influence. Workers that possess strong PSM, and on the other hand they don't recognise possibilities and opportunities toward contributing to community development through their work and are not associated with greater performance, lead to run out of steam (Van Loon, 2015).

PSM is subject to change through times and stages, therefore it does not have a constant characteristics or features (Van Loon, 2015). That means that public institutions may affect employee's motivation. Fiscal rewards and benefits are less appealing and efficient for public employees than fundamental and substantial benefits and rewarding's (Perry, Mesch, & Paarlberg, 2006). Moreover, certain external rewards like controlling or performance steering, that represent a critical process in NPM concept, are perceived to be less efficient in enhancing employee's performance in public organisations (Potcovaru & Girneata, 2015).

Perry et al. (2010) state, that Public service entities must provide a wider variety of encouragement and motivation, like work restructuring, promoting the social value of job duties, and workforce engagement in the decision-making process. In conclusion, public entities have changed their human resource strategies and procedures to meet the desires and expectations of their society and community along from the outside setting. Consequently, the smooth development method related to HRM, which was so popular and traditional in public institutions, has changed to performance.

The intellectual and entrepreneurial reasoning supporting NPM, that triggered this change, stands in direct opposition to the reasoning of the profession concerning public institutions employees, who focused their actions and activities on public service purposes and motivations. The foregoing conventional governmental or "good employer" approach towards HRM by centralising the welfare of public workers, appears more acceptable to fulfil the emotional, moral standard, and the motive of workers. Such features and attributes of government service employees and public institutions employers are expected to influence TM in Public institutions.

Career pathing tends to be a struggle, as most civil employees see a career not in the wider public sector, but rather as a journey towards greater things. The organisational framework does not encourage career pathways, flexibility in work practices, the development of integrated skills or results. The emphasis on the strategy of talent management to connect the employee to organisational success is reinforced.

4. Concept Roots of Talent and Talent Management

Based on Latin literature, talent refers to talentum. The root of this term refers to a gift. Talent is often employed as a criterion for persons having specific capabilities, skills, and knowledge. Whenever an individual shows the will, capacity, capability, and competency to do particular or specific things more efficiently than another individual, such individual is identified as talented. Certainly, the word talent is prominent in our daily life and on top of our tongue, however, when it goes to management profession or area, there is no single coherent and compatible meaning for Talent. Talent is considered one of the aspects of individual potentials. Nowadays, due to the development of the world economy, recruiting, attracting, and keeping talent has turned out to be a significant driver for decision and policymakers (Beechler & Woodward, 2009). Creative, skilled, capable, qualified, and brilliant people etc. are mainly called talented individuals or people. They are not conceiving and realising themselves as assistant or supporter, instead they are leaders and should be treated as such. Thus, treating and handling talented individual through conventional management and leadership is not efficient and accurate (Salacuse, 2006).

Some scholars disclosed further complicated conceptions once referred to talent, like the total value of an individual's capabilities, fundamental competencies, expertise, knowledge, wisdom, reasoning, behaviour, personality, and motivation; in addition to people's learning or growth capabilities (Michaels, Axelrod, & Handfield-Jones, 2001). Several entities often agree that, as strategic objectives and goals shift, talent will shift in nature and meaning (Ashton & Morton, 2005). In addition, talent could be a resource to be cultured and educated instead of leaving it to be neglected and weaken persons (Michaels, Axelrod, & Handfield-Jones, 2001). Talent is an aspect of individual resources and capacity that present reform and improvement in the procedure and structure of the organisation and lead to the contribution of organisational quality, efficiency, and effectiveness across its potential (Halim, 2010). TM requires employing an interconnected collection of actions in order to make sure the firms attract, keep, and enhance talent workers they want today, tomorrow, and in the firm's long run (Campeanu-Sonea, Sonea, Gabor-Supuran, & Muresan, 2011). Institutions have their own principles and concepts about a talented candidate, and they differ across each other. Apparently, managers have a transparent knowledge that possessing specific potential and competence in today's marketplace is not only necessary and essential, instead, to utilise and improve such talent throughout the future. Talents are a repeated fashion or type of thinking, feeling, or behavioural patterns that could be implemented efficiently. They're unique and exceptional; and they exist throughout the world, for example, nursing possesses talents for emotional feelings; a doctor specialised in surgery possesses talents for uncertainty and risk. Executives recognise that everybody has potential and talent, which can be found and applied efficiently (BucKingham & Coffman, 1999). Talent can be described as vital, unique, and difficult to emulate, although it is not often obvious what the talent instructions and recommendations are (Heckman & Lewis, 2006).

TM means emphasising and promoting a group of accurately chosen workers, known as talented people. They are recognised as strategically significant for organisational planning, continuity, and performance. Therefore, key challenges involve attracting, hiring, improving and keeping those people in addition, the principle is spreading across a broad variety of

tasks in these distinct stages (Bexell & Olofsson, 2005). Yet, TM often requires consideration for responsibilities, for job flexibility and versatility, leading workers to have the ability to make a further effective performance of their talents (Campeanu-Sonea, Sonea, Gabor-Supuran, & Muresan, 2011). Examining HRM desire and the strategic plan to meet such desire is the sense and purpose of TM (Cappelli, 2008). Evaluating overall professional perspectives in the context of talent and TM, we should acknowledge that every organisation recognising its significance and quality is a unique competency, which generates sustainability and competitiveness in the future (Vladescu, 2012).

5. Talent Management Definition in Public Sector

Modern research on TM illustrates the problems associated with TM in a selected group of entities. Almost all papers and articles on TM concentrate on TM in private businesses, global companies, and institutions in the United States (Vaiman & Collings, 2013). Researches on TM was mainly based on data gathered from a certain empirical procedure in private and public institutions; however, the importance of the context of the organisation is not considered because the authors did not explain the difference among both types of organisations in interpretation and analysis of results. In addition, several articles on TM in the public sector were published, however, such theoretical articles consider and generally address TM and do not relate it to the public context (Calo, 2008). Altogether, only a relatively small number of articles are aware of the problems of TM in public service institutions like the medical care institutions (Groves, 2011), educational institutions (Davies & Davies, 2010), or national governmental entities (Glenn, 2012). Searching and seeking for pertinent literature, information was gathered from eighteen published resources, containing textbooks, articles, reports, and book sections with primarily concentration and emphasis on public sector TM. The article examines and addresses the most important matters in the TM context, in addition to the particular problems and concerns presented and posed through the small portion of publications found on TM in the public or government sector.

5.1 Talent Definition

TM is frequently defined as an organised and consistent system that attracts, recognises, grows, engages, retains, and deploys talent (Scullion, Collings, & Caligiuri, 2010). In the concepts or definitions of TM, scholars follow distinct notions for talent, like exceptional skills, yet, include words like core or vital workers, and highly potential people who represent a valuable organisational interest. The diversity of expressions employed in describing talent represents one of the most critical TM discussions and debates; whether TM is an inclusive method based on skills or capabilities of all workforce, or an exclusive method intended to attract, recruit, and retain a specific type of workers (Gallardo , Dries, & Conzalez-cruz, 2013). These specific types of workers belong to a special individual, namely, highly potential people, or to certain limited and influential roles in an organisation such as a managerial or leadership posts. Based on scholarly debates and discussions on TM, talent concept appears to move to the exclusive perspectives (Gallardo & Thunnissen, 2016). Some researchers argue that the inclusive method exist practically and operationally, it is also an

integration and mixture of both the TM method, the inclusive and exclusive. Regarding such improvements, lately, TM researchers have begun to discuss and investigate the probabilities of differentiated TM structures and strategies. This concept is taken from the marketing context, where the unique wants and desires of different types of workers are treated jointly.

The literature reveals that in public or government sector institutions, the inclusive and exclusive methods exist, but a small amount of work published contribute to the reasons and logic behind TM methods. Glenn (2012) states that the inclusive method much probably takes place in mutual and combined bargaining settings. Improvements in the job market, both internally and externally, are also affecting the approaches to TM. The increasing number of retired individuals or the lack of jobs in the market, public institutions reveal a propensity to establish an exclusive method for filling the gap with limited and desirable roles (MacFarlane, Duberley, Fewtrell, & Powell, 2012). However, to which degree is this emphasis on an entirely modern, exclusive, or unique group of workers for public institutions? There is an extensive legacy in the international relations and affairs domain in order to attract, select, and develop the superior candidate for becoming a potential policymaker. Fewer applicants are chosen and overwhelmingly, such recruiters get an HRM exclusive method. A further illustration of commonly adopted TM concepts in public sector settings is managing foreign employees who work in foreign government agencies like the UN, IMF, World Health Organization, World Bank (Vos, Boselie, Brewster , & Vos, 2013). Such workers travel and are transferred to other nations and frequently followed by their belongings (wife/husband and kids). Those ex-pats also receive significant attention, care, and advantage through exclusive human resource programs and an impressive bundle of compensation. Also, the implementation of the TM concept is specifically linked to the HRM of practitioners, including public officials, teachers, judges, technical experts, and health care professionals. Considering the professionalism of their job, they are granted unique education, advancement, incentives, and privileges in accordance with fairly high levels of independence. Despite the fact that such specialists are facing an increased tension and scrutiny, many experts holding such professions are obtaining exceptional care or holding a pivotal role throughout public or government institutions and are also recognised as the institution's highly successful and efficient public employees (Schneider, Noordegraaf, Boselie, & Van Rensen, 2016). With the exception of certain published papers by academics who work on the high-educational field. The literature offers scarcity of resources to the problems of TM relevant to such professionals. Almost all public sector TM published papers concentrate on attracting and retaining executives (Bradley, 2016). The public or governmental sector seeks the greatest and intelligent executives, administrators, and leaders (Day, Shickle, Smith, & Zakariasen, 2014), in addition to a unique TM system aiming to attract, recruit and keep talented people, namely senior management, in order to set the rule of the game and be the fight winner to the road for talent (Tummers & Knies, 2013).

5.2 Limitation on Implementing Talent Management

Authors proposes several elements and determinants that are willing to push or prevent the adoption and application of TM in business or private industry, namely, external and internal elements (Rani & Kumar, 2014). External significant elements are either related to a wider background in which a company works, like population variations (Festing & Schafer, 2014), workforce adaptability (Collings & Mellahi, 2009), fiscal condition (Nolan, 2011), rules and regulations (Sidani & Al Ariss, 2014), cultural structure (Iles, Chuai, & Preece, 2010), political environment (Vladescu, 2012), in addition to specific background, including business talent scarcity (Farndale, Scullion, & Sparrow, 2010), sectoral characteristics (Burbach & Royle, 2010), and competitiveness (Ready & Conger, 2007). Internal significant elements are either relate to roles that would promote TM and make it more easy and smooth like incentives for staff improvement and professional advancement and evolution (Grégoire, Cornelissen, Dimov, & Van Burg, 2015), business strategy (Joyce & Slocum, 2012), workforce engagement and contribution (Mochorwa & Mwangi, 2013), managing staff recruitment (Frank, Finnegan, & Taylor, 2004), recruiting and selecting highly qualified persons or talent people (Lewin, Massini, & Peeters, 2009), information technology existence (Al Ariss, Cascio, & Paauwe, 2014), the provision of objective and subjective motivating activities (Annakis, Dass, & Isa, 2014), or hard institutional factors including the promoting brand name of the entity (Theurer, Tumasjan, Welpe, & Lievens, 2016), institutional cultural identity and structural framework (Gallardo , Dries, & Conzalez-cruz, 2013), organisation social situation (Kunisch, Menz, & Ambos, 2015) and managerial support and guidance (CIPD, 2010). Similarly, the effective adoption of TM in the public industry can be affected internally and externally (Clarke & Scurry, 2017). Although the number of significant internal considerations exceed the outer elements ones, it is important to emphasise the importance of both elements if institutions want to achieve favourable results while managing and implementing a TM approach.

5.3 Impact of the Internal Elements on TM in Public Industry

Organisation reputability is regarded as a technique in order to win and draw talent from public industry or sector (Glenn, 2012). Therefore, TM implementation improvements toward the public sector and attraction of talented people, tasks must be matched with organisational strategic goals of public interest to involve existing and future employees (Garrow & Hirsh, 2008). Furthermore, extremely dedicated workers may help TM in encouraging debate between workers at a different level of the organisation (Kock & Burke, 2008) and improving every worker's specific commitment to the achievement of institutional objectives (Thunnissen & Buttiens, 2017). In the light of the key concepts of the public sector, which depends on social rights and equality, TM inclusive approach promotes the general public value objectives by enhancing the participation of all workers (Glenn, 2012). Encouragement from top managers and leaders is also significant, since they could accelerate or restrain TM adoption (Reilly, 2008). Apart from stakeholders' positive involvement, organisational culture will motivate or restrict TM adoption. Culture in the public industry is fundamentally bureaucratic in nature, frequently preventing creative activities, namely TM as an example (Troshani, Jerram, & Hill, 2011), because TM adoption could contradict such cultural value and might end up failing to meet

the employee's expectations (Garrow & Hirsh, 2008). Whatever TM approach is applied, TM in public sector requires integrating the potential social effects through its priorities. Namely, TM will identify the main public context and social value goals (Thunnissen, Boselie, & Fruytier, 2013). TM may further promote specific human resource related activities like attracting and keeping talented workers, that will facilitate the development and enhancement of such people careers in the public sector (Kock & Burke, 2008). A wide variety of substantial and unessential incentives may further maintain the ego-motivation of public workers to meet institutional objectives. These activities may allow TM to build a continuous inner source of talent (Harrisr & Foster, 2010). Development in information technology related to fundamental TM activities may further increase public TM efficiency. Government sector agencies may, for instance, use advertisement through social media in order to attract future talented candidates (Tufts, Jacobson, & Stevens, 2015). Information technology could further be valuable in terms of audit objectives, for e.g., workers operational rates or levels, and thus ensuring that talented workers are retained (Troshani, Jerram, & Hill, 2011). In addition to the rise of e-recruitment across several worldwide cities as a major and creative technology to attract talented people (Llorens, 2011).

5.4 Impact of the External Elements on TM in Public Industry

The role and effect of politics, rules and regulations, culture and economic conditions are crucial in adopting TM in the public industry (Kravarity & Johnston, 2019). Variations in political agendas, for example, indicating budgetary adjustments, therefore, it will probably reduce the fiscal wallet that supports the adoption of TM (Troshani, Jerram, & Hill, 2011). Laws and regulations always affect the implementation of TM, like in china, talented people education and training is promoted by the public service legislation in china (Yang, Wu, Xu, & Chen, 2012). Effective adoption of TM may be influenced by demographic characteristics and qualities. Considering that several baby boomers, today, are at the retiring stage, organisations must seek methods to attract youth people and change their TM based on such methods (Glenn, 2012). It appears more complicated whenever recognising that the new generations with greater desires and ambitions are further interested in job quality and support flexibility (Van Den Brink, Fruytier, & Thunnissen, 2013). Institutions, therefore could not last on relying on the loyalty and have to find paths for attracting and maintaining talent. The worldwide crisis in 2008 had provided many potentials and opportunities in order to attract talent into the public industry (Reilly, 2008). Scholars argue that the competitiveness of talent in private industry is because of the public sector bureaucratic nature. (Poocharoen & Lee, 2013). In contrast, it is hard to recognise talents from the public sector, like humans that have specific skills, values, abilities, and expertise that represent the basic tenets of the public sector, that in effect causes talent gaps and deficiencies (Thunnissen & Buttiens, 2017). To demonstrate effectiveness in public sector, TM strategy should be assessed in order to improve organisational capacity to handle long term workforce functions and tackle specific social concerns (Kock & Burke, 2008).

5.5 Talent Management Results

The measurements of expected TM results are a key subject in the research on TM. Why should talent be managed? For what aims? Regarding such questions or concerns, TM researchers agree that achieving organisational objectives is dominant (Thunnissen, Boselie, & Fruytier, 2013). Nevertheless, prominent TM researchers like Collings (2014) highlight the significance of performance-taking in a wider spectrum and examine the quality of worker, institutional, and social degree based on TM value. Particularly, the debate of the importance of TM at the large society scale (social, economic, cultural, and so on.) is modern and prominent, yet, certain academics have begun to investigate such approach and have taken into consideration "Global Talent Competitiveness Index" or work on shortage of capabilities or excess in an area or nation (Rodriguez, 2015). Thunnissen et al. (2013) contend that due to stakeholders' variety and institutional goals, such result-perspectives are extremely important for public service institutions. However, the publications on TM in the public industry took little care of TM results and of the significance of quality and achievements, by means of performance, in public sector entities (Vandenabeele, Leisink, & Knies, 2013).

5.6 Talent Management Methods

Till nowadays, almost all TM published works have missed a concise definition of specific TM methods (Dries, 2013). A wide range of tools have been identified and recommended concerning recruiting, hiring, growth, and retaining, without any more classified or structural manners. Present literary writings on TM appears to support the hard TM production-oriented method, mainly the exclusive method, through its preferred choice for highly organisational goals and performance (Thunnissen M., 2016). TM soft process could be related to the inclusive TM method, which is embraced by certain TM academics highlighting the improvement and development of overall workers talents. Literary texts on TM suggest that TM strategies are weakly implemented in public entities, TM could be described as reactive and dispersed (Lynn, 2001). Several researches refer to TM hard process undergoing organisational examination. For example, in the United Kingdom, Health Service TM is highly rational, bureaucratic, centralised, and performance and structural based (MacFarlane, Duberley, Fewtrell, & Powell, 2012). The researchers argue that such public organisations have implemented a TM strategy which is much more challenging than those of other private institutions. Even if effective private firms support hard TM, they follow a much more complex strategy that acknowledges the limits of increased standard processes and simplified performance measures (MacFarlane, Duberley, Fewtrell, & Powell, 2012). In her research on TM in German National colleges, Thunnissen (2015) often reports a hard TM process. The researcher reveals that the Flemish governmental administration plans to follow an inclusive method to TM and still follows an exclusive method in operation, namely, an exclusive disguised method (Buttiens, 2016).

As a result of social growth and the NPM reform process, particularly, based on efficiency, effectiveness, and contest for talent, TM is probably to achieve awareness in the everyday activities of public service institutions. The way the government or public institutions work

in various communities is complicated and challenging. The approach through which TM is applied relies heavily on contextual matters, either if it is inclusive or exclusive.

6. Talent Management: Managing Conflicts and Contradictions

In this section of the article, we discuss the conflict among the logical and administrative reasoning derived from HRM and NPM philosophy in the public sector, in addition, the technical reasoning of public or government employees through their behavioral focus on an inherent desire to support citizens and provide great public value services. This study believes that such conflict will affect the overall-sector strategies to TM. Whereas several important problems are discussed in the existing literature on TM, the latest works on public-sector TM do not discuss these conflicts in detail. Particularly, regarding the talent concept, the degree of worker specialisation, and the relation among performance and commitment and TM, we recognise problems of dualism, contradiction, uncertainty and equilibrium as explained below.

Table 1

TM discussion factors and Concerns in Public Sector Perspectives

TM Discussion Factors	Concerns
Government or the "Good Employer"	1. Ancient: Internal Labor market 2. Current/Long-run: Higher Commitment System, Higher Performance Work System, and Higher Involvement-Work System 3. The effect of potential changes from the internal labour market to creative and revolutionary platforms, and their impact on TM
Equality	The extent of feasible and appropriate distinction of workers considering the standards of equality inside public sector environments
Relevant laws, rules and processes applied in the public sector in addition to the professionalism standards	Potential complaint processes, organisational obstacles and constraints, and bureaucracy inside the entity, the sector, and professional structure
Government Cuts	The scope for TM programs and developments
New Public Management and modern management systems like performance, lean, and TM	The TM perception and value concerned to such models and their influence on workforce behaviours and beliefs.
Institutional performance, employee's objectives, and TM consequences	The driving factors toward public sector employees, the influence of PSM on worker's performance, TM effect, and meaning of worker's objectives and nature of TM taking into account the complexity of public industry performance measurements
Integrating exclusive and inclusive TM concepts	The degree to which TM methods that represent a more exclusive for experts and management be mixed with TM inclusive methods for the whole staff

6.1. Differentiation vs Equality: Recognising Talent

Depending on the analysis above, we believe that the concept of talent is among the fundamental problems facing TM in the public sector. Public debate regarding talent conceptual framework is heavily affected by differentiation and equality conflict. As is proposed in the exclusive method, workforce differentiation is most probably creating conflict through the concept of equality or fair treatment; treating employees equally, and

that's strongly associated with TM inclusive method (Lepak & Snell, 1999). TM exclusive method reveals a clear comparison is drawn regarding talented people and non-talented people , suggesting that talented people are a little bit happy and the non-talented ones are not at all. Workers differentiation toward professionals, like distinct health care professionals in the medical centres, is most likely widely agreed in terms of the unique experience, competencies, and capabilities of professionals combined to the institutionalisation of such occupations. Nevertheless, implementing the differentiating concepts of HRM and TM to less-skilled positions and roles, including administrative trainees, and executives can trigger equality concerns and problems in public sector environments. Such a class of workers is prominently positioned in public sector publications on TM. Based on their research on TM in United Kingdom health service, researchers raise a query if TM must concentrate on employee's commitment to public service rather than on potential leaders due to the reasons that taking care of a sick person is not delivered by executives; instead, it is given by health care professionals (MacFarlane, Duberley, Fewtrell, & Powell, 2012). Many scholars examine the conflict among the conventional public principles of equality, justice and rightness and the exclusive perspective suggesting that not all employees are similar and equal or equally managed and treated (Lynn, 2001) (Harrisr & Foster, 2010). Due to such conflict, Harrisr and Foster (2010) noticed that senior executives preferred an inclusive method in United Kingdom public service institutions. Thus, the researchers emphasise the significance of practical and fair distribution articulated in a clear, consistent, and equal method of selection.

6.2. Talent Management Results: Providing Social Interest vs Organizational Performance

Certain Scholars employ the AMO (Ability, Motivation, and opportunity) framework arguing that only one declares of talent when strong motivational, in order to support the consumer and community, combined with powerful skills contributes to superior performances. However, still efficient behaviour and performance in the public industry is a complex structure (Ulrich & Ulrich, 2010). Existing TM studies brings special awareness in order to boost and control personal performance, yet, public service and social interest are frequently not provided independently, instead, they are the outcome of a collective endeavour of the group. In addition, several HRM authors have trouble identifying performance within public entities, considering that such entities have various objectives and agendas that frequently clash between each other due to the pressures of diverse stakeholders such as the government, residents, client or end-users service, and political parties. Efficient, Effective, and quality of fund e-for-money are desires that represent the cornerstone of NPM, may walk in severe disparity with the development of public or social interest and value. Such uncertainty regarding performance often influences the public sector discussion on TM results (Boselie & Thunnissen, 2017).

6.3. Processes of Talent Management: Commitment Impact and Motivation vs Performance

The "good employer" or government that provides lifelong jobs, job stability, strategic growth and development, and wage and salaries improvements that are closely connected to

positions, which represent the components of the internal labour market system and still prevalent in almost all public and governmental institutions, does not match the complexities and challenges faced by public institutions (Baron & Kreps, 1999). Such obstacles contain government cuts, private ownership contracts and removal of restrictions, bureaucracy minimisation, NPM, and heavy reliance on transparency, accountability, and legality. The main challenges and threats of TM in public sector environments are government or policy cuts, that impose severe restrictions on HRM activities like recruiting, selecting, educating, preparing, growing, and compensating employees. The latter may further have a bad effect in investing in TM programs, precisely since such strategies lack financial resources. The growing awareness to improve performance management strategies like lean management system represents a reflection of NPM. Such initiatives have turned into light with consideration of the modern efficient and effective emphasis on performance and quality as a consequence of government cuts and responsibility and obligation toward the public. Nevertheless, the implications of such initiatives are frequently recognised as extremely related to top management, and may have a potential influence on workers' performance and expectations (Buttiens, 2016). Rather than a challenging performance focus, Public sector principles and employees in this domain especially highlight the value of improving people and social welfare (Boselie, 2014). As opposed to the influence of the internal labour market, many writers propose something like a strong dedication solution or greater involvement working method (Boxall & Macky, 2009). Trying to adopt such a method to TM in the public sector will indicate that the emphasis is not specifically based on raising and managing performance, as mentioned in TM "hard" process, however, it explores the unintended way of motivation for performance enhancement, therefore, fitting the significance of the above mentioned PSM. Emphasising on motivational aspects is in accordance with the focus for human resource activities that must be based on creating motivation, involvement, and growth of participants in the talent challenge, and moving from a temporary transaction-based behavioural framework towards a future relation-based behavioural framework (Collings & Mellahi, 2009). Based on such highly commitment solutions, the government, as the major player in the public industry, can involve training and improvement focused on employment prospects, horizontally developmental aspects based on role enhancement and independence, the spread of competence in coordination with expertise and capability, renovation of task by promoting the public meaning in job activities and exchange of information within the group, expanding workforce engagement in the process of making decisions, and incentives for outstanding results by the team member. However, to choose the correct set of activities, motivational approaches rooted in PSM must be considered.

We are conscious that the implications of implementing these creative programs suggest a more distinction of HRM rules and procedures between individual and team of workers, as mentioned earlier. A potential shift from an internal labour market system to novel solutions of HRM structure in the public sector environment is in itself a struggle between both concept and practice. However, we agree that TM differentiation and competitiveness, when viewed like a mix of exclusive strategy and inclusive one, represents a fascinating choice to public institutions toward meeting various stakeholder desires.

6.4. An Agenda and Research Plan

We have defined, both internally and externally, the conceptual influences that are responsible for the effective adoption of TM. Consulting firms offered perspectives into how TM can help the public sector in enhancing human capital development and workers recruitment, which may possess an effect on the provision of public service, efficiency, creative and innovative thinking (Australian Public Service Commission, 2013). The public industry wants to address issues concerning its cultural values, the essence and complexities of the implemented TM activities, and the involvement of major stakeholders, before adopting TM. Therefore, a study plan on such subjects is recommended. Because most of TM study and application is in the private industry, we contend that it is essential to understand the bureaucratic and regulatory complexities of the public industry when seeking to hire and assign talent while pursuing an exclusive strategy.

The implementation of NPM throughout public institutions in addition to reform impact on the public industry to attract talent from the public or government sector, has resulted in a reduction in both workforce involvement engagement and governmental confidence (Dougherty & Van Gelder, 2015). NPM initiatives and financial plan cutbacks kept several governments without defining and attracting long term required talent (Hay Group, 2011). The study is needed on the obstacles and impacts of austerity policies on the ability of the public sector to draw, handle and position talents so they can make a contribution to the quality and performance of the industry. Furthermore, developments relating to individual building capabilities and particularly the implementation of TM are seen as weakening fundamental principles of fair treatment and accountability in the public industry (Van Den Brink, Fruytier, & Thunnissen, 2013). Researchers discovered that honourable admission test criteria were considered a threat to attract extremely talented public individuals. Governments or the good employer experience a trade-off among ideals of fair treatment and efficient methods to recruit skilled workers because public sector is based on values instead of talents (Poocharoen & Lee, 2013). In this sense, TM is a rapier, because it may frustrate individuals not recognised as a talent, and create scepticism regarding the processes for recognising talented people (Harrisr & Foster, 2010). Talent differential care is in conflict with fair opportunity and treatment standards in public industry.

In public institutions, implementing TM decentralisation methods is indeed a challenge (Poocharoen & Brillantes, 2013), since these institutions operate based on legitimate-bureaucratic organisational reasoning instead of business-managerial reasoning that represents NPM (Thunnissen & Buttiens, 2017). For instance, recruiting and selecting processes hinder interaction with talented people, given that in certain environments such as in the United Kingdom, each applicant must undergo, regardless of circumstances, entrance exams that are expensive and require a lot of time (Hudson, 2017). Thus, talents are easily discovered and hired into the private industry with very few bureaucratic criteria for legitimate hiring and choosing. This leads to important job opportunities positions in the public sector not being replete (Van Den Brink, Fruytier, & Thunnissen, 2013). Therefore, the public sector must have to recognise diverse approaches like e-recruiting programs, as stated earlier, for the attraction and retention of talented people. Long term study may investigate the efficiency of those approaches in enhancing talent development in the public domain.

Performance measurements in the private sector is evaluated based on fiscal and monetary goals and results (Hudson, 2017), while in public industry, they are further complicated due to the efforts made to evaluate intangible results (Kock & Burke, 2008). Political and social responsibility towards accountability and transparency place a burden on public shoulders and lead it to sidestep risk and the inflexibility of bureaucratic regulations on wage levels and external rewards limits the adoption of public sector TM (Delfgaauw & Dur, 2010).

In addition, public sector environments include transformations, such as the shift from internal labour market systems to a highly job performance process designs, inconsistent objectives and results, like conflicts among various stakeholders, and concepts competition, such as, professional reasoning against performance, industry, management and leadership reasoning, that mostly lead to "evil issues" which could not be not simply resolved. Such concepts, desires, and results live together within contemporary public sector entities and generate conflicts that influence TM policies and procedures (Thunnissen M., 2016). They generate conflicts, duplicity, inconsistencies, and contradictions that institutions in the public sector need to work with. Authors proposed that future study on TM in the public sector may take advantage of the paradoxical concept framework (Smith & Lewis, 2011). They describe a paradox as conflicting but interdependent items that appear together and remain throughout the moment; these items appear reasonable when perceived isolated, but illogical, conflicting and ridiculous once mixed (Smith & Lewis, 2011). The analysis of the paradoxical framework, situational problems and environmental elements is interconnected with organisational strategies, initiatives, expectations and results (Vandenabeele, Leisink, & Knies, 2013). For both conceptual observations and different and innovative methods, the paradoxical concept framework may be a great commencement for more TM studies in public sector environments.

Such framework could serve in examining the challenges, conflicts and contradictions of public-sector TM in further depth and provides prudence of the way through which public entities operate through them. Comparing this concept with studies and analysis based on contradictions and conflicts in TM private industry to figure out whether such conflicts are limited to public industry or even exist in private one would be a fascinating insight. Institutional theory is commonly applicable in public management and administration, and even to a certain extent in HRM (Paauwe & Boselie, 2003). It creates a solid foundation for long term study on TM in various public domains, especially considering the potential distinctions among specialists employed in such environments, for example, judges, academics, instructors, and healthcare professionals. Though that, several TM researchers contribute their works to the institutional theory, which is included in 10% of TM published works, those academics frequently neglect to adopt this theory that represents an overall and detailed structure for collecting information and results analysis (Gallardo-Gallardo, Nijs, Dries, & Gallo, 2015).

Thus, we propose that authors and researchers in the TM field consider a more stringent and accurate research model. Rather than focusing on which conceptual frameworks to choose, it is more critical than academics take strategic theoretical positioning decisions and continuously implement them within the same study, thus, assisting to resolve qualitative study frameworks and define and explain relationships and causality among factors and indicators (Gallardo-Gallardo, Nijs, Dries, & Gallo, 2015).

PSM is extensively debated in public administration management field (Vandenabeele & Perry, 2015), and much more study may be based on, including, integrating AMO (Ability, Motivation, and Opportunity) philosophy into HRM and the insights gained from past PSM research while examining TM and the relationship among TM, performance, and PSM in public environment. A previous published works Harvard paradigm modified version after 31 years of its emergence in 1984 may expand the connection among TM, performance, and PSM (Beer, Boselie, & Brewster, 2015). Such paradigm illustrates the importance of a complex performance framework, considering organisational efficiency and people and social welfare.

Moreover, the researchers note that worker's effect by means of engagement, commitment, and organisation, is extremely significant in the area of HRM, and the latter is a public and social network in a typical environment. Such arguments take place perfectly within public sector setting, given its diverse stakeholders, legislation, commitment process, engagement, and organisations and its highly complex results, such as effective and efficient organisation procedures, personal welfare by means of the government, and societal interest , which represent the connection to social welfare. Vandenabeele et al. (2013) tend to be a successful concept model and incorporate some of the aforementioned conceptual basic components. It is a strong basis for a study on HRM in public institutions and also for long term study on TM.

Nevertheless, we need to extend an aspect to the conceptual model concerning TM. This framework relies just on organisational processes and eliminates market processes. However, many researches on public sector TM suggested that internally and externally job markets adjustments have influenced organisational TM strategy.

Our study demands further work on problems and solutions to TM in public or Governmental institutions at large. Furthermore, a comparative analysis among various types of institutions in the public industry may be especially useful in determining the effect of institutional variables on TM. Such comparative analysis will assist in explaining more what institutions in the public sector seek to accomplish through TM, for what purposes, and the effectiveness of such performance. A multi-dimension method that involves both organisational leaders, namely, HRM and executives, and workers, is important for an effective and efficient TM. In addition, we suggest further comparative analysis across countries.

Conclusion

This article offers a summary of fundamental concerns for long term TM study in public sector environments and addresses a range of important concerns that may have significant effect and value for public sector professionals involved in implementing TM, namely specific problems and concerns issues like TM perception, the value and importance provided by concerned people in TM field, and the effect of TM on worker's behaviours and performance. There are no clear approaches for TM in public entities and there is little chance that "best practices" would occur on a widespread basis. Thus, it is necessary to prevent copying TM oversimplified activities from other public or governmental or private entities without a careful examination of organisational context both internally and externally.

El Ammar, C. (2021). Talent Management Philosophy in Public Sector: A Key for Managing Conflicts and Contradictions.

The article provides a precise description of talent and TM in public sector along with an analysis of the opportunities, problems, and matters embracing TM adoption in the public sector. Thus, Talent in the public industry can be identified as those people who have skills, abilities, expertise and beliefs that represent the basic tenets of public and social service and value for the benefit of society. Furthermore, TM in the public industry is described as human resource essential application practices, ensuring that talent from the public sector works into this framework to handle challenges, resolve conflicts, and achieve strategic goals of the public.

Also, inner and outer influences criteria probably affect the effective adoption of TM and the requirements that should be taken into consideration by public institutions. The crucial internal elements were split in, first of all, activities that might enhance the adoption of TM, like hiring and selecting, and second, soft organisational aspects that might push or restrict adoption of TM, like cultural aspects of the organisation. The influence of the outer elements was also classified by activities that contribute to the wider contextual background of the organisation, like local cultural values, and activities that are unique, specific, and relevant to the institutional context, like talent's gaps. Ongoing and long-term studies need to examine if it exists good or worse TM methods that may contribute to a debate about why and how a particular TM strategy functions in only certain cases. TM public sector agencies, in a particular sense, is a type of mini-HRM. Several HRM's current contextual discussions and debates are significant and able to be compared to modern TM discussions and debates within public institutions. Concluding, context and situations vary and in such specific challenging situations, solutions for TM are not simple.

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THE S&P 500 CURRENT RECORD-HIGH LEVELS AGAINST FUNDAMENTAL PE AND PBV RATIOS[2]

The subject of this research is the performance of the S&P 500 index during the last decade, including in the context of the 2020 Covid pandemic. The main issue of interest is whether the index price levels are supported by fundamentals, or there is a bubble on the US stock market. The study is based on the use of the price-earnings ratios (PE) and price-to-book ratios (PBV) of the index during this period. The 2020 PE and PBV of the index are compared with historical market PE and PBV ratios. Another aspect of the analysis also involves fundamental PE and PBV ratios of the S&P 500 index, which are derived from the fundamentals, determining the value of stocks in the index. The results of the analysis do not confirm the validity of the high current PE and PBV ratios and do not justify the high stock price levels of the S&P 500 during most of 2020.
Keywords: stock markets; PE and PBV ratios; fundamentals; stock market bubble
JEL: G11; G12; G15

1. Introduction

One of the main questions that has constantly excited analysts, investors, investment bankers and everyone else interested in the capital markets at each stage of their development, is whether price levels of traded securities are justified or not. This issue is even more acute in times of uncertainty, turmoil and crisis, such as the current one, due to the COVID-19 pandemic.

For most of the last decade, stock markets in general, and the US market in particular, have set new and new price records. Thus, in the period after the global financial crisis, this used to give rise to another discussion about whether the US market is again in the situation of another bubble. The prevailing opinion is that the big collapse of the stock markets during the global financial crisis of 2007-2009 was due to the previously formed price bubbles. Proponents of this understanding are generally more likely to see another bubble in the US market, and not only in it, for most of the post-crisis period. However, according to other analysts, before the global financial crisis, there was no price bubble, and the collapse in stock prices only reflected the deterioration of the fundamental indicators of companies and

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the economy as a whole. According to this second group of market participants and observers, the levels of stock-market indices in the post-crisis years and at the present stage are fully justified and supported by the significantly increased earnings potential of companies. Among these analysts, there are those who have predicted and continue to predict serious potential for further growth in stock prices, above previous record levels.

The probable movements in the stock market in the short run remain outside the present study. In this regard, temporary, short-term factors and influences on market movements remain in the background. The focus is entirely on the sustainable, medium-term and long-term values of the important variables that should determine stock prices in the long run.

2. General Approach of the Analysis of Stock-Market Price Levels

As typical indicators for the existence of a price bubble on the stock market Henry Blodget points out (Blodget, 2011):

1. Excessive stock prices compared to fundamentals;

2. Everyone participates in the market and everything rises;

3. Skeptics have been alarmed about the presence of a bubble for years;

4. People say en masse that "This time is different";

5. There is a huge leverage in the system.

According to Blodgett, a significant factor for the long duration of sectoral or general market bubbles are the huge waves of capital that flood the market along the lines of the "Three I":

- Innovators

- Imitators, and

- Idiots (virtually everyone else).

Innovators are the first to identify high-potential stocks and make big profits. Imitators simply copy them and also achieve relatively high profitability. "Idiots" step in at the end when the potential for additional returns is virtually exhausted. As a result, prices continue to rise and there is a widespread fraudulent feeling that this will be a long-term trend.

At the present stage, however, people are not en masse with such an attitude - they are more likely divided. There are those who expect the market to continue to rise steadily, others claim that most of the shares have unreasonably high prices.

Regarding indicators 2, 3 and 4, a lot could be discussed, as there are signs and arguments for their manifestation. Definitely, the markets have been growing rapidly in the last 7-8 years and set record after record. During all this time, there have been numerous warnings about the presence of a bubble, including from well-known experts with a high reputation. The arguments for the "new economy" and the "new factors" for future growth, familiar from previous bubbles, have been heard again. Nevertheless, these three indicators have not

manifested themselves so strongly, as compared to the technology bubble from the late 1990s.

This is not the case with the fifth indicator for a market bubble mentioned above – ***the huge leverage in the system***. The problem is not really new and the danger in this aspect remains rather real, given the zero (or close to zero) interest rates for more than a decade, the ongoing government "incentives", the huge government deficit not only of the United States, but also too high levels of consumer and government debt in the world as a whole. There is unprecedented printing of money by leading central banks, and so-called "quantitative easing", intensified sharply in order to overcome the economic difficulties caused by the Covid-19 pandemic. In other words, the "records" in this aspect seem to be much more impressive than the above-mentioned stock market price records. All this inflates stock prices. It is in this regard that back in 2013, Aswath Damodaran said that it is very possible that the market is in the centre of a bubble, caused by the Federal Reserve Bank, which traditionally never ends well (Damodaran, 2013). For this reason, Damodaran makes the following statement: "The market is dancing to the music of the Fed. The question is not whether the music will stop, but when?" (Damodaran, 2013).

According to Ray Dalio of Bridgewater Associates, founder of the world's largest hedge fund, "Today the economy and markets are run by central banks in coordination with central governments. As a result, "capital markets are not free markets that allocate resources in the traditional way" (Infostock, 2020).

According to Nobel laureate Robert Shiller, the global financial crisis of 2007-2009 once again reminded of the need for a qualitative analysis of stocks and their price levels, both for the individual investor and for the better functioning of markets as a whole (Shiller, 2012; 2015). The same is especially true in the context of the current crisis in the markets, caused by the Covid pandemic.

In the present study, the focus is on *the first indicator* – what stock prices look like in relation to *fundamentals*. The main consideration is that the proposed study is mainly in the context of fundamental analysis. In other words, the logic that follows is that the source of the value of companies, and hence of shares, is the expected future income that they can bring to their owners (Nenkov, 2005). Thus, in the end, the value of the company is a function of:

- *the earnings potential (cash flow potential),*

- *the expected growth of earnings (cash flows),*

- *the level of risk.*

An appropriate way to analyze the market as a whole is to use market ratios such as the price-earnings (PE), price-to-book value (PBV) and others. It is natural to ask the question "Why exactly market ratios, given that we are talking about research in the context of fundamental analysis?". Fundamental analysis is logically related mainly to the models of discounted future cash flows – they are designed to determine the fundamental value of stocks. The use of relative valuation methods based on these same market ratios has traditionally been considered as an alternative to DCF models, i.e. an alternative to fundamental analysis. According to Damodaran, they are used to determine primarily the market price, not intrinsic

(fundamental) value. Thus, comparative evaluation methods seem far from fundamental analysis. This division is directly related to the question raised by Prof. Damodaran: "Are we pricing or valuing?" (What are we looking for – price or actual value?) (Damodaran, 2012). According to him, DCF models (fundamental analysis) are aimed at determining intrinsic value, and relative (market ratio) methods are aimed at determining the market price (Damodaran, 2012).

Damodaran's views on relative valuation methods are far from unfounded. Comparative valuation methods are particularly desirable for use in long-term bullish markets, where optimism has gripped almost all market participants, prices are inflated and continue to rise. In such conditions, the reason for the preferences for comparative methods are not only their advantages, but also their disadvantages. These methods are particularly convenient for "justifying" apparently inflated stock market prices during upside markets (Nenkov, 2017).

In reality, however, there are also other views on this issue. To the extent that market ratios have become (standardized) forms of stock prices, they should also be a function of the ***three fundamental variables*** discussed above: *the earnings potential, the expected earnings growth and the level of risk*. This is natural and logical, as long as any prudent investors, regardless of their preferences for one or another valuation approach, are guided primarily by their ideas and expectations about these three variables – sometimes explicitly (in DCF models), sometimes implicitly (in relative valuation, while using market ratios).

For example, Burton Malkiel clearly links fundamental stock valuation analysis to the use of the PE market ratio. When explaining the techniques of fundamental analysis, he does so in the context of the interpretation and application of the PE ratio. According to Malkiel, "The fundamentalist uses four basic determinants to help estimate the proper value for any stock". They are as follows (Malikel, 2015):

- Determinant 1: The expected growth rate;

- Determinant 2: The expected dividend payout;

- Determinant 3: The degree of risk;

- Determinant 4: The level of market interest rates.

In fact, Malkiel refers to the same fundamental factors (variables) that determine the value of shares and which have been commented above. At the equity level, suitable indicators of the three fundamentals are respectively (Nenkov, Bathala, 2008):

- ROE – synthesized expression of the earnings potential (per 100 units of equity invested);

- g – expected growth rate of EPS (net earnings per share);

- R_E – cost of equity (expressing the degree of risk of the respective stock).

In this case, Malkiel's four determinants are another combination of the above *three indicators (variables) of fundamentals*, that determine the value of a stock. *Determinant 2 –* the expected dividend, concerns the potential of the share to generate income for its owners, but in absolute terms. More generally, it can be represented by the dividend payout ratio (1-b), which in turn should be equal to: $(1\text{-}b = (1\text{-}g/ROE = (1\text{-}g/(EPS/Equity))$. In other words,

the dividend (*determinant 2*) is a function of the stock's earnings potential (ROE) and the projected growth rate (g). *Determinant 1* – the expected growth rate (g), is the indicator of the second fundamental variable. *Determinants 3 and 4* in combination are an expression of the cost of equity – risk-free interest rate, plus a risk premium for the respective stock. In other words, *determinants 3 and 4* together are an expression of the indicator of the third fundamental – risk.

It is no coincidence that the price-earnings ratio (PE) is the oldest market ratio used to analyze stocks and make investor decisions. In other words, from the group of market ratios, it is the one with the "longest experience". This is quite logical. The main reason for its great popularity among the investor community is that it shows one of the most direct relationships of interest to investors – the relationship between the price they pay per share of stock and the income that this share brings. This is actually the relationship between price and the first of the three fundamental variables - *the earnings potential*. Apparently for this reason, James O'Shaughnessy says that "The PE ratio per share is the most widely used measure of how cheap or how expensive a stock is compared to other stocks. Many investors tend to pay above the average price based on current profits because they believe that the company can achieve high growth once it has high PE. Thus, most people equate high PE stocks with so-called *growth investing* (O'Shaughnessy, 2005).

At the same time, investors who buy shares of low PEs think they are making a very profitable deal. They usually believe that when PE is high, buyers have unrealistic expectations about the growth of earnings per share. As a result, the prices of these shares are inflated. Conversely, proponents of this position believe that stocks with low PE ratios are unreasonably undervalued and when profits recover, their prices will also go up. This group of investors is known as *value investors*. Accordingly, this method of stock selection is known as *value investing* (O'Shaughnessy, 2005).

The situation is similar to the price-to-book value ratio (PBV). There is a direct logical connection between PE and PBV. Clyde Stickney decomposes the actual PBV ratio and presents it as the product between PE and ROE (Stickney, 1996), i.e.:

$$PBV = PE \times ROE \qquad (1)$$

The reason for deriving this dependence is seen by presenting the PBV as a function of what it is equal to:

$$PBV = \frac{P}{BV} = \frac{P}{EPS} \times \frac{EPS}{BV} = PE \times ROE \qquad (2)$$

In other words, the PBV ratio also represents a direct relationship between the price per share and the fundamental variable *earnings potential* – in absolute terms (EPS) and in relative terms (relative to equity – ROE).

Market ratios, also called market performance indicators or market multipliers, are one of several important sets of ratios for financial analysis of public companies (Brigham, Gapenski, 1994; Hristozov, 2020). What sets them apart as a group, is that in the numerator of each of them is the market price per share (P_0) or, alternatively, the enterprise value (EV) of the company. This specificity of the market ratios allows for their use in several different directions:

- In the analysis of the financial performance of the respective companies, whose stocks are traded on the capital market;

- In the analysis of the stock market as a whole, of different sectors, including for comparison between markets and sectors;

- In relative valuation methods, for valuing other companies (multiples approach or peer companies approach).

An important advantage of market ratios is that they provide comparability for the needs of comparative analysis, both between different companies, sectors and markets, and in a dynamic aspect – between different historical periods. This is due to the fact that market ratios are a kind of "standardized" share prices, or prices on a common basis (Damodaran, 2012). According to Burton Malkiel, market multipliers (such as the price-earnings ratio (PE)) provide a good yardstick for comparing different stocks that have different prices and different earnings per share in absolute terms (Malkiel, 2015).

One of the problems with market ratios research is that relatively little is written about it. According to Emanuel Bagna and Enrico Ramusino, "market multipliers are used more than they are studied. Stock analysts, investment bankers and other practitioners make extensive use of market multipliers to determine the value of companies. However, the literature on multipliers is not as rich as the widespread use of these assessment tools in practice suggests." (Bagna, Ramusino, 2017). The current price-earnings (PE) and price-to-book (PBV) ratios will be used in this specific market price analysis. With the help of these ratios, the current levels of the stock market indices can be analyzed as follows:

- By reviewing the dynamics of the actual PE and PBV ratios in historical terms, and comparing them to the current PE и PBV levels;

- By determining fundamental PE and PBV ratios and comparing them to the current actual PE and PBV ratios.

In the first case, the current price levels against the average historical values are tested. In the second case, the current price levels against what the fundamental variables dictate are tested, insofar as the fundamental ratios are entirely their function. In this regard, it is useful to know that *the actual market ratios show at what price the **stocks are traded**, and the fundamental ratios show at what price the **stocks should be traded***.

Both proposed aspects of the analysis seem extremely simple and clear and create an expectation for easy and definite conclusions. However, their application is actually quite demanding in itself and usually raises more new questions than originally asked. Almost always (in fact, always) additional analysis of each of the input variables is required, as a result of which many different assumptions and variants are invariably reached. This usually blurs and calls into question the conclusions as to whether the market is overvalued, undervalued or adequately valued. However, despite these conventions, the analysis in the above two aspects usually leads to a much better and more informed view of where the market should be at this stage.

3. Historical Levels of PE and PBV Ratios and Comparison with Their Current 2020 Levels

The appropriate stock index for the purpose of this analysis is the S&P 500. The reasons for choosing this particular index are as follows:

- The US market was the one that recorded the most remarkable price records throughout the post-crisis period. In this sense, it is the most interesting to analyze in terms of the question *"Is there (or has there been so far) a stock market bubble?";*

- S&P 500 is one of the most widely monitored indices in the world. It is a very broad index, including 500 large public companies in the US, traded on US stock exchanges, and according to many experts, is the most representative of the US stock market as a whole. It is considered that its structure by sectors and industries replicates the structure of the US economy as a whole;[3]

- The S&P 500 is also highly representative of the global stock market, as it represents over 30% of the market capitalization of all public companies in the world. The total market capitalization of the S&P 500 as of June 30, 2020, amounts to about 27 trillion US dollars, which is about 80% of the total market capitalization in the United States.[4]

As of March 13, 2020, the breakdown of the S&P 500 by sector is as follows:[5]

- Information Technology: 24.4%
- Health Care: 14%
- Financials: 12.2%
- Communication Services: 10.7%
- Consumer Discretionary: 9.9%
- Industrials: 8.9%
- Consumer Staples: 7.2%
- Energy: 3.6%
- Utilities: 3.5%
- Real Estate: 3.1%
- Materials: 2.5%

Table 1 shows the average values of the PE ratios of the S&P 500 index for a period of almost 150 years – from January 1871 to August 21, 2020, for trailing PE, and from January 1881

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[3] Data source: https://www.thebalance.com/what-is-the-sandp-500-3305888.
[4] Data source: https://www.google.com/search?q=s%26p+500&rlz=1C1GCEU_enBG895BG 895&oq=S%26&aqs=chrome.1.69i57j0l5j46j0.3051j0j8&sourceid=chrome&ie=UTF-8; Data source: https://www.thebalance.com/what-is-the-sandp-500-3305888.
[5] Data source: https://www.thebalance.com/what-is-the-sandp-500-3305888.

to August 21, 2020, for Shiller PE. The latter are Cyclically Adjusted PE, known by the abbreviation CAPE. Also included for comparison are the current values as of August 21, 2020, and their percentage difference from the arithmetic mean.

Table 1

Average PE Ratios of the S&P500 for the Period 1871-2020

Indicator	Shiller PE (CAPE)	Trailing PE
Mean	16.73	15.81
Median	15.79	14.83
Minimum	4.78 (December 1920)	5.31 (December 1917)
Maximum	44.19 (December 1999)	123.73 (May 2009)
PE Ratios as of August 21, 2020	**31.26**	**29.20**
Difference from the mean (%)	**+86.85**	**+84.69**

Source: http://www.multpl.com/s-p-500-price-to-earnings/table/by-year (21.08.2020).

It can be seen that Shiller PE varied in a fairly wide range, with a minimum value of 4.78 in December 1920 and a maximum value of 44.19 in December 1999, in the midst of the Internet bubble. The fluctuations of the trailing PE are even bigger, reaching 123.73 as of May 1, 2009. This is not due to high stock prices, as at that time they were almost at the bottom. The reason is too low profits in the midst of the crisis. Table 1 also shows that the average values of the Shiller PE ratios of the S&P 500 index for the period 1881-2020 differ very little from the trailing PE ratios. The arithmetic mean for the former is 16.73, and for the latter – 15.81. The medians are 15.79 and 14.83, respectively.

Against the background of these historical averages, the current levels of market PE ratios (as of August 21, 2020) of **31.26** (for CAPE) and **29.20** (for trailing PE) seem to be very high. Shiller PE ratio is by **86.85%** higher than the arithmetic mean. The trailing PE ratio is respectively by **84.69%** higher than the arithmetic mean. Since the historical average values of the ratios for a long period of time are considered normal, it is logical to conclude that the current higher PEs are most likely an indicator of unreasonably high stock prices.

Table 2

Price-Earnings Ratios (Trailing PE) of the S&P 500 for the period 1999-2020

End of Year	1999	2000	2001	2002	2003	2004
PE	29.04	27.55	46.17	31.43	22.73	19.99
End of Year	2005	2006	2007	2008	2009	2010
PE	18.07	17.36	21.46	70.91	20.70	16.30
End of Year	2011	2012	2013	2014	2015	2016
PE	14.87	17.03	18.15	20.02	22.18	23.59
End of Year	2017	2018	2019	April 1, 2020	August 21, 2020	
PE	24.97	19.60	24.88	24.97	29.20	
Mean	25.61		Minimum	13.50	Sep 2011	
Median	22.18		Maximum	123.73	May 2009	
Difference: current-mean (%)	+14.02					

Source: https://www.multpl.com/s-p-500-pe-ratio/table/by-year, (21.08.2020).

One of the arguments in favour of the validity of the current high PE ratios is that the lower average historical values are mainly due to periods quite distant in the past, which are not representative of the conditions of the 21st century. With regard to this, Table 2 presents the current PE ratios only for the last 22 years, from 1999 to August 2020. The aim is to see how they have moved over the last two decades and what the averages are, based on this period alone. This period is supposed to be much more representative of current and future market developments, according to opponents of the use of long historical periods as a base. The arithmetic mean value of PE for this period is 25.61, and the current PE as of August 21, 2020, is 29.20, exceeding this average by 14.02%. On this higher basis, the S&P 500 index in August 2020 again seems overvalued, but with very little. The question remains whether there are enough arguments to accept the significantly higher average of the last two decades of 25.61 as normal.

Table 3

Price-to-Book Ratios (PBV) of the S&P 500 for the Period 1999-2020

End of Year	1999	2000	2001	2002	2003	2004
PBV	5.05	4.05	3.39	2.73	3.03	2.92
End of Year	2005	2006	2007	2008	2009	2010
PBV	2.76	2.81	2.77	2.00	2.17	2.17
End of Year	2011	2012	2013	2014	2015	2016
PBV	2.05	2.14	2.58	2.83	2.76	2.91
End of Year	2017	2018	2019	March 31, 2020	August 21, 2020	
PBV	3.23	2.94	3.53	2.92	3.84	
Mean	2.83		Minimum	1.78	March 2009	
Median	2.77		Maximum	5.06	March 2000	
Difference: current-mean (%)	+35.69					

Source: http://www.multpl.com/s-p-500-price-to-book/table/by-year (8.07.2020).

Table 3 shows the values of the price-to-book (PBV) ratios of the S&P 500 for the period 1999-2020. It is noteworthy that there is no year that ends with a PBV ratio lower than 2.00. For different years (as of December 31), it varied between 2 at the end of 2008, at the height of the financial crisis, and 5.06 at the end of 1999, during the internet bubble. By quarters the lowest value is from the end of March 2009 – 1.78, and the maximum is from the end of March 2000 – 5.06. The arithmetic mean and median are 2.83 and 2.77, respectively. Logically, the question arises as to what is the source of value-added, which makes it possible for the market price to be almost three times higher than the book value. And the current value as of August 21, 2020, of 3.84 is as much as 35.69% higher than the average for the period. Interestingly, as of March 31, 2020, at the height of the market crash caused by the Covid pandemic, the PBV ratio dropped to 2.92, i.e. still higher than the average value for the entire 20-year period.

It is indisputable that in both studied ratios, the current values are significantly higher than the historical averages. This is especially evident with the PE, if the whole historical period since 1871 is used. Assuming that historical averages are an indicator of the normal level of PE and PBV, this should mean that current stock prices in the S&P 500 are seriously overvalued.

The only counter-argument remains the possibility to assume that the average historical values of the two market ratios are not representative for the current stage. In other words, this would mean agreeing that there is now a "new normality" in this respect, for example, in the context of another "new era" in business. This is an important aspect of further analysis in the current research.

4. Fundamental PE and PBV Ratios of the S&P 500 at This Stage

The fundamental PE and PBV ratios are entirely a function of the already discussed three fundamental variables: earnings potential, earnings growth rate and risk. As it has become clear, the appropriate indicators for these three fundamental variables at the level of equity are:

- Return on equity – $\boldsymbol{ROE}$;

- Expected EPS growth – $\boldsymbol{g}$;

- Cost of equity – $\boldsymbol{R_E}$.

Fundamental ratios for the S&P 500 index are calculated below, based on the characteristic values of the fundamental variables at this stage. Current fundamental PE is used, which should ensure comparability with current and trailing actual PEs. The specific one-step model used is as follows:

$$PE = \frac{(1+g) \times (1-b)}{R_E - g} = \frac{(1+g) \times (1 - g/ROE)}{R_E - g} \tag{3}$$

Where:

    PE – fundamental price-earnings ratio,

    ROE – return on equity,

    g – expected growth rate of earnings per share (EPS growth),

    b – plowback (retention) rate,

    R_E – cost of equity.

Respectively, the model for determining the fundamental PBV ratio is as follow:

$$PBV = \frac{ROE \times (1+g) \times (1-b)}{R_E - g} = \frac{(ROE - g) \times (1+g)}{R_E - g} \tag{4}$$

Where:

PBV – fundamental price-to-book value ratio

The input variables are the same as in the model for determining the fundamental PE: ROE, g, b, R_E.

Each of the two fundamental ratios is then calculated on the basis of two-step models, the results of which are much more reliable. In order to correctly determine the fundamental PE

and PBV, the appropriate input variables must be derived, that are sufficiently representative of what will happen in the future (Hristozov, 2020). This in itself is more difficult, given the many options and sources for deriving these input variables – ROE, g, b and R_E.

4.1. Selecting the appropriate input variables for the model

Return on equity (ROE)

The return on equity (ROE) is a key variable for the fundamental ratios PE and PBV, not only because of its direct participation in the model. ROE is also often used in forecasting another key variable – EPS growth rate (g).

ROE can be taken from different sources and on different bases, incl. current value, average for the last 5 years, average for the last 10 years, etc. The aim is to choose the ROE that we believe is most representative of the future. The ROE ratio of the S&P 500 for the last full year – 2019, is 15.92%. The average for the last 5 years is 14.61%, for the last 10 years it is 15.35%, since the beginning of this century it is 15.37% (Aleksandrova, 2012). In its models for determining the current market risk premium (ERP), incl. as of September 1, 2020, and to determine the value of the S&P 500 index, Damodaran used a trailing ROE of the index for the last four quarters of 16.29% (Damodaran, 2020). The good thing, in this case, is that ROE does not vary significantly in different sources and for different sub-periods within the current century. For example, if we choose the current one as more representative, we will bet an ROE of about 16%. If we choose a more representative average for the last few years (5, 10, 20), we will focus on a coefficient of about 15%, or the difference is insignificant. For the needs of this model, for the fundamental PE and PBV an **ROE** of **15.50%** will be used.

Expected growth rate (g)

The expected EPS growth rate (g) can be determined in several ways (Nenkov, 2015):

- as historic growth rate;

- as internal (fundamental) growth rate;

- by using the forecasts of security market analysts;

- by using the sector average or the market average growth rate (when a forecast about (g) for a specific stock has to be made).

The specific way in each case depends on the available data, as well as on whether a *temporary growth rate* (for the next few years) or the so-called *stable growth rate* is being forecasted for an indefinitely long period in the future.

The growth rate of earnings per share (EPS) of the S&P 500 varies significantly across periods, unlike ROE, as discussed above. Combined with the fact that there are a number of ways to determine (g), it makes it difficult to decide which is the most representative growth

rate. For example, the historical growth rate of earnings per share of the index, calculated as a geometric mean, from point to point, is as follows: [6]

Period	S&P 500 EPS Growth
1871-2019	1.94%
1979-2019	2.61%
1989-2019	3.72%
1999-2019	3.25%
2006-2019	2.30%
2010-2019	4.90%
2015-2019	10.36%

It can be seen that the historical growth rate of EPS of the S&P 500 index seems quite uneven and very dependent on the specific selected period. One important reason, in this case, is the way of calculating the average – it is a *geometric average*, from point to point. In principle, it is an adequate measure of actual growth for a given period, but it is very sensitive to the indicators for the first and last year. If the first year of the selected period has an atypically low EPS, then the average will be skewed upwards. This is the case with the period 2015-2019. If the last year has an atypically low EPS, the average will be skewed downwards. One way is to use some smoothing, by calculating the geometric mean, but "from average to average". And an even better option is to use least squares regression - the average thus obtained should generally be the most representative of the actual historical growth rate. In addition to these weaknesses, the historical growth rate has another – it is that the historical growth rate is often not indicative of what the future rate will be.

This is one of the main reasons for using quite intensively the so-called *internal growth rate*, in which (g) is defined as a function of the current earnings potential of the company and the plowback (retention) ratio of profit:

$$g = ROE \times b \tag{5}$$

Where:

   g – the forecasted EPS growth rate,

   ROE – return on equity,

   b – plowback (retention) ratio.

The main advantage of the internal growth rate is that it takes into account the actual potential of the company to generate a specific growth rate at this stage. This means that the following are taken into account: the rate of return on invested equity and the company's policy for reinvestment of profits, in the pursuit of EPS growth. In this sense, this way of predicting (g)

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[6] Data source: https://www.multpl.com/s-p-500-earnings.

can be considered firmly grounded. This approach is particularly suitable for forecasting growth for the next few years, or the so-called *temporary growth rate*.

It is very clear from the model that this way of predicting growth rate (g) is very sensitive to the correct selection of ROE and retention ratio (b). For the present analysis, it can definitely be said that there is no serious case with ROE – we have already decided that it is correct to use ROE = 15.5%.

The plowback ratio (b), is a direct function of the payout ratio, which is (1-b). Regarding the historical payout ratio of the S&P 500, the data show that in the past it was much higher, but decreased in the last one or two decades. For the whole period 1871-2019, the average payout ratio is 61%. From 1871 to 1960, it was 68.86%, and from 1961 to 2019, it dropped to 49.02%. From 2010 to 2019, it was 39.47%, and from 2015 to 2019, it was 45.07%.[7]

Does this mean that there is a steady downward trend in the payout to shareholders by the 500 companies in the index? On dividends – yes, but on cash flows to shareholders - no. It is very important to take into account the widespread share repurchase (or stock buybacks) policy since the 1990s. These could be considered as a kind of "hidden dividends", "extraordinary dividends", "special dividends", paid to shareholders in addition to regular, traditional dividends. For this reason, the classic payout ratio is, in many cases, quite misleading. This is exactly the situation with the S&P 500, because the policy of repurchase of shares has been intensively applied by the companies in the index for the last 2-3 decades. In this regard, in his models A. Damodaran deals with an extended payout ratio, which is determined by adding to the dividend the cash flow from share repurchases and the amount divided by the net profit, or:

$$Payout\ (1-b)_{modified} = \frac{Dividends+Buybacks}{Earnings} \tag{6}$$

This could be called a *modified payout ratio*. This seriously changes the picture in terms of the actual part of the profit that has been directed to the shareholders during this period. It turns out that the share of profits paid out during this period is much higher than the traditional payout ratio shows. Respectively, the share of the profit that remains for reinvestment during this period is much smaller. Thus, this modified payout ratio, according to the data used by Damodaran, for 2019 is as much as 93.08%. For the last 10 years it is 87.96%, and for the last 5 years – 97.85%.[8] These high values of almost 100% should not be a surprise, given that since the beginning of this century, cash flows to shareholders through share repurchases in most years have exceeded cash flows in the form of dividends. Thus, the average annual dividend yield for shareholders in the companies of the S&P 500 for the period 2001-2019 is 1.94%, and their average annual yield from stock buybacks is 2.77%.[9]

Based on the above data, a high payout ratio to the shareholders of the S&P 500 companies of the order of 90% is not far from reality. This would mean a profit retention ratio (b) of

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[7] Data source: https://www.multpl.com/s-p-500-earnings.
[8] Data source: http://pages.stern.nyu.edu/~adamodar/, 6.09.2020.
[9] Data source: http://pages.stern.nyu.edu/~adamodar/, 6.09.2020.

about 10%. Thus, with an expected ROE of 15.5% and a retention rate (b) of 10%, the expected internal (fundamental) growth rate for the next 4-5 years should be:

$$g = ROE \times b = 0.155 \times 0.1 = 0.0155 = 1.55\%$$

A very modest and conservative growth rate is obtained, which is due to the extremely low projected profit retention ratio. This could be adjusted in view of the current situation, which requires additional investment by companies to restructure and adapt to the new conditions. Thus, repurchases are likely to shrink sharply, and dividends will be negatively affected for many companies. On the other hand, it should not be forgotten that one major reason for buybacks by companies is the lack of good opportunities for new successful investments in the real economy. In this respect, the economic environment is unlikely to improve in the next few years. Things are not limited to the desire and intentions to invest in real assets, but also to the availability of favourable opportunities for this.

When forecasting the growth rate of EPS during the period of the so-called stable (sustainable) growth, a recommended and reliable way is by forecasting the nominal growth of the economy as a whole in the long run. In this approach, the future growth rate (in the more distant future), for a long period of time (ideally – until infinity), is determined by adding the projected inflation rate and the projected growth (real growth) of gross domestic product (GDP).

In the longer term. Forecasts for this approach should, as a rule, be more conservative, given the long (unlimited) period in the future. One commonly used benchmark for long-term growth is the *current yield* of long-term treasury bonds (Damodaran, 2020). This same indicator is often used as a risk-free rate for the needs of CAPM (capital asset pricing model) and will be commented on later in the analysis (*This is the approach used for the purposes of this analysis.*)

Short, medium and long-term forecasts of specialized investment and consulting firms can also be used. It is useful to check these forecasts to what extent they are supported by the growth rates that are projected through the alternative ways presented above to determine the growth of EPS. Commonly used forecasts are those of Thomson Reuters, Factsheet, Yardeni, S&P Capital IQ and others. The latest forecasts for the growth rate of EPS of the S&P 500 index since July 2020 take into account the effects of the current Covid 19 pandemic. Various sources predict between 20% and 26% decline for 2021 and subsequent recovery within 2021 and 2022. The average cumulative growth rate (geometric average) by the end of 2024 varies from 3.28% at Yardeni (Top-Down Estimates), 4.7% for Thomson Reuters (Bottom-Up Estimates), 4.7% for Analyst Consensus (Bottom-Up Estimates), to 4.89% for S&P Capital IQ (Bottom Up Estimates).[10] The average value of the four forecasts is 4.39%.

In this analysis, we use the average annual growth rate of EPS in three variants, corresponding to the three variants of the cost of equity. These three options are based on the yield of risk-free long-term securities – long-term US Treasury bonds, as follows:

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[10] Data source: http://pages.stern.nyu.edu/~adamodar/, 6.09.2020.

- growth rate (g) based on the ***historic yield*** of 10-year US treasury bonds, calculated as **arithmetic average**;

- growth rate (g) based on the ***historic yield*** of 10-year US treasury bonds, calculated as **geometric average**;

- growth rate (g) based on the ***current yield*** of 10-year US treasury bonds.

At the time of the study, the current yield of 10-year US treasury bonds is at a record low level – only 0.72%, mainly as a result of the Federal Reserve's policy of close to zero interest rates. The geometric mean for the longest period (1928-2019) is 4.88%, and the arithmetic mean is 5.15%, respectively. Reasons to use exactly these rates, equal to the corresponding risk-free rate, become clear in the context of the logic of determining the price of equity.

Cost of equity (R_E)

Usually, the most complicated is the case with the third fundamental variable – the risk expressed in this case by *the cost of equity*, i.e. *the required rate of return on common stocks* (R_E). This is probably the most controversial input parameter for the model for calculating the fundamental ratios. Table 4 shows the determination of the cost of equity on the market portfolio of common stocks in the United States by 2020. The capital assets pricing model (CAPM) is used. The beta coefficient is equal to 1, because the object of analysis is the market portfolio as a whole. The risk-free rate is represented by the yield on 10-year US treasury bonds, and the market risk premium is the difference between the yield on the market portfolio of ordinary shares and the yield on 10-year treasury bonds. In this case, the problem stems from the existence of various possible options for determining the risk-free rate of return and market risk premium (Aleksandrova, 2012). The first choice is between the *historical average* and the *current (implied)* value of each. There are pros and cons to using either. If a historical average is chosen, another subsequent choice is required – between *arithmetic average* and *geometric average*. And here are the pros and cons of each.

Thus, in the end, the CAPM model leads to different costs of capital at the same time. The question is which is the most correct, the most appropriate to be used (Hristozov, 2020). It is not the task of the present study to go into the depth of this discussion. We will simply use three different variants of these input variables in the application of the model and then calculate three different fundamental PE and PBV, corresponding to the different variants.

The historical averages for the risk-free rate and the risk premium are based on the longest available period: from 1928 to the end of 2019. The current risk-free rate and the current risk premium are as of September 1, 2020. Academic researchers usually favour historical averages, and managers and analysts in practice almost necessarily adhere to current values. The latter guarantee results closer to the prevailing market view.

Table 4

Risk-free rate, market risk premium and cost of equity (R_E) in the USA for 2020

Indicator	Risk-free rate (%)	Beta coefficient	Market risk premium (ERP) (%)	Cost of equity (%)
Historic – arithmetic average	5.15	1	6.43	11.57
Historic – geometric average	4.88	1	4.83	9.71
Current (implied) – 1 Sep, 2020	0.72	1	4.62	5.34

Source: http://pages.stern.nyu.edu/~adamodar/.

The highest value is for the cost of equity, calculated as historical arithmetic mean – 11.57%, and the lowest – 5.34%, is the cost of equity calculated on the basis of the current risk-free rate and current risk premium. In the middle is the cost of equity-based on historical geometric average – 9.71%. The current cost of equity of 5.34% is at its historic lowest values. The reason was already commented above – it is that "the market plays on the music of the Fed". This also shows the low actual expected and required rate of return by investors in common stock at the present stage and is definitely the decisive factor for the high levels of indices, and for the high levels of market ratios. The atypically low current cost of equity lies in the current risk-free rate of return of **0.72%** (almost zero), as compared to a historical arithmetic mean of 5.15% and a historical geometric mean of 4.88%.

A very important finding in this regard is made by Daniel White, Senior Research and Strategy Manager at Canada Life Investments in London. It is that for many investment professionals, there has never been a world in which interest rates have done anything but go down. He shares: "I started in 1994. Throughout my career, interest rates have been falling. It was a one-way trade to buy growth-oriented stocks" (Infostock, 2020).

The leading reason for this abnormally low risk-free rate of return is the artificially maintained by the Fed low, close to zero, interest rate. At this stage, this is dictated by the need to support an economy that has been hit hard by the Covid crisis. In reality, however, the artificial maintenance of unnaturally low-interest rates and so-called quantitative easing by central banks has been valid for the whole decade since the global financial crisis. It's just that this policy has been further strengthened in the current pandemic crisis. According to Michael Harnett, chief investment strategist at the Bank of America's research unit, "stock prices are rising not because of optimism about the economy, but in fact, because the future looks relatively bleak." (Sokolova, 2020). This leads to the biggest paradox in the current stock market. It turns out that the worse the economy, the better for stock market growth.

On top of that, apart from the very low risk-free rate, the current market risk premium at the moment of 4.62%, is also slightly lower than both historical averages, despite the difficult situation for the economy. In such periods of low-interest rates, as well as in periods of higher uncertainty, the current risk premium rises well above average, as it did at the start of the Covid 19 pandemic. However, with the current stock market frenzy, it has fallen again from 6.02% (or 5.76% excluding the effects of the pandemic) as of April 1, 2020, to just 4.62% (as of September 1 2020).[11]

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[11] Data source: http://pages.stern.nyu.edu/~adamodar/ (1.09.2020).

5. Fundamental PE и PBV Ratios for the S&P 500

The input variables for applying the one-stage models of fundamental PE and PBV have been selected in the previous section, and are as follows:

- Return on equity (**ROE**) – **15.50%**;

- EPS growth rate **(g) – three variants: 5.15%, 4.88%** and **0.72%**, corresponding to the three variants of the cost of equity;

- Cost of equity **(R$_E$) – three variants**:

  ➢ Historic arithmetic average – **11.57%**;

  ➢ Historic geometric average – **9.71%**;

  ➢ Current (implied) – **5.34%**.

The fundamental PE and PBV, calculated on the basis of the one-stage model, are not precise enough. This model reproduces the shortcomings and limitations of the Gordon dividend model from which it is derived. However, the fundamental PE and PBVs thus obtained give some initial idea of what the correct average values of the actual PE and PBV should be. On the other hand, these shortcomings of the one-stage model can also be useful, while illustrating some of the typical gaps that are made in the valuation of stocks and thus provoke analysts to look for ways to avoid them.

In this case, the PE and PBV ratios are calculated in three variants corresponding to the three variants of cost of equity and are presented in Table 5. The growth rates in each of the three variants correspond to the three different risk-free rates, used to determine the cost of equity. At a cost of equity of 11.57%, the fundamental PE is 10.94. At a cost of equity of 9.71% it is 14.88 and at a cost of equity of 5.34% it is 20.79. The values for the fundamental PBV are respectively: 1.70 at a cost of equity of 11.57%, 2.31 at a cost of equity of 9.71%, and 3.22 at a cost of equity of 5.34%. In general, the one-step model is characterized by the strong sensitivity of the calculated fundamental ratios to the different combinations of input variables. This is best seen at combinations of low cost of equity with more optimistic growth rate forecasts, leading to abnormally high or negative ratios. However, in this particular analysis, the sensitivity of the model is not so impressive due to the logically selected growth rates, corresponding to the cost of equity forecasts. Thus, in this case we do not come to negative values in the denominator of the model, and hence to the calculation of negative ratios that have no economic meaning.

Table 5

Fundamental PE and PBV ratios for the USA for 2020 (one-stage model)

Indicator	R$_E$ (RRR$_E$)	(1-b)	ROE	g	PE	PBV
Variant 1	**11.57%**		15.50%	5.15%	**10.94**	**1.70**
Variant 2	**9.71%**		15.50%	4.88%	**14.88**	**2.31**
Variant 3	**5.34%**		15.50%	0.72%	**20.79**	**3.22**

Source: Calculations of the author.

The calculated fundamental ratios based on the two-stage model are also in three variants, corresponding to the three variants of cost of equity. They are presented in Table 6. In this model, the future is divided into two sub-periods – temporary growth period and stable growth period. For the period of stable growth, which is more distant in the future, it is recommended to use more conservative input variables, closer to the average values. This applies to each of the three input variables.

For the application of the two-stage model, additional input parameters are used. The input variables are as follows:

- Duration of the initial period of temporary growth: n = 5 years;

- Return on equity during the initial period of temporary growth: ROE_1 = 15.50%;

- EPS growth rate during the initial period of temporary growth: (g_1) – in three variants: 5.15%, 4.88% and 0.72%;

- Cost of equity during the initial period of temporary growth: (R_{E1}) – in three variants: 11.57%, 9.71% и 5.34%;

- Return on equity during the period of stable growth: ROE_2 = 15.50%;

- EPS growth rate during the period of stable growth: (g_2) = 4.88%;

- Cost of equity during the period of stable growth: (R_{E2}) = 9.71%.

At a cost of equity for the first sub-period of 11.57%, the calculated fundamental PE amounts to 13.87, at a cost of equity of 9.71% it is 14.88, and at a cost of equity of 5.34% it is 17.20. The values for the fundamental PBV are respectively: 2.15 at a cost of equity of 11.57%, 2.31 at a cost of equity of 9.71%, and 2.67 at a cost of equity of 5.34%. Here the opposite of the one-stage model is observed in terms of sensitivity - the obtained ratios vary within a very small range and are always with values that make economic sense. This is due to the fact that for the period of stable growth (after the fifth year) the forecasted values for the cost of equity (R_E) and the return on equity (ROE) are closer to the average. Such forecasts are justified because, in the long run, the average cost of equity and the actual average return on equity (ROE) are expected to converge.

Table 6

Fundamental PE and PBV ratios for the USA for 2020 (two-stage model)

Indicator	RRR_{E1}	$(1-b)_1$	ROE_1	g_1	PE	PBV
Variant 1	**11.57%**		15.50%	5.15%	**13.87**	**2.15**
Variant 2	**9.71%**		15.50%	4.88%	**14.88**	**2.31**
Variant 3	**5.34%**		15.50%	0.72%	**17.20**	**2.67**
	RRR_{E2}	$(1-b)_2$	ROE_2	g_2		
	9.71%		15.50%	4.88%		

Source: Calculations of the author.

What has been discussed above makes the question of the validity of the cost of equity that has been used particularly important. The current implied cost of equity of 5.34% can be considered unreasonably low, mainly due to the low current risk-free rate of 0.72%. The

historical geometric average of 9.71%, which is somewhere in the middle between the three calculated cost of equity, should be considered as the most justified. Hence the conclusion that the most reasonable are the fundamental ratios with average values, those of Variant 2 in the last table - respectively PE = **14.88** and PBV = **2.31**.

6. **Actual PE and PBV of the S&P 500 at the Background of the Fundamental PE And PBV of the Index**

The following Table 7 compares the obtained fundamental PE and PBV ratios with the actual average historical PE and PBV ratios of the S&P 500 for the period 1999-2020. Table 7 does not use the average fundamental ratios under Variant 2, which were outlined as the most logical and reasonable (according to the author's opinion). These are respectively PE of 14.88 and PBV of 2.31. Instead, a compromise is made and the highest fundamental ratios obtained are taken. They are the result of using the low current cost of equity and amount to: PE = 17.20 and PBV = 2.67. The idea is to take into account the prevailing now market view on the expected return on investments in common stock. The table shows that the actual PE and PBV of the S&P 500 for the period 1999-2020 are higher than the relatively optimistic fundamental PE of 17.20 and PBV of 2.67. The actual PE is by 32.84% higher than the fundamental PE and the actual PBV is by 5.65% higher than the fundamental PBV.

Table 7

Actual average Vs. fundamental PE and PBV for S&P 500 for the period 1999-2020

Market Ratio	Actual Average 1999-2020 Arithmetic mean	Fundamental Two-stage model	Difference (k.2-k.3)	Difference (%)
k.1	k.2	k.3	k.4	k.5
PE	25.61	17.20	8.41	32.84%
PBV	2.83	2.67	0.16	5.65%

Source: Calculations of the author.

Table 8 shows that the excess of the current actual PE and PBV ratios as of August 21, 2020 compared to the fundamental PE and PBV, as obtained under the two-stage model, is even greater. Thus, the actual current PE is as much as 41.1% higher than the optimistic fundamental PE, and the current PBV is as much as 30.47% higher than the optimistic fundamental PBV.

Table 8

Actual current Vs. fundamental PE and PBV for S&P 500 as of 21 Aug, 2020

Market Ratio	Current Actual – August 21, 2020	Fundamental Two-stage model	Difference (k.2-k.3)	Difference (%)
k.1	**k.2**	**k.3**	**k.4**	**k.5**
PE	29.20	17.20	12.00	**41.10%**
PBV	3.84	2.67	1.17	**30.47%**

Source: Calculations of the author.

7. Conclusion

In the present study, the current levels of the S&P 500 index have been analyzed using the market ratios PE and PBV. For this purpose, the current actual ratios were compared: 1/ with their average historical values and 2/ with the respective fundamental ratios PE and PBV. The latter have been calculated for this purpose, based on projected values for *ROE*, *g* and cost of equity (R_E).

Thus, in the end, the answer to the question *"Is there a new bubble in the US stock market?"*, is rather *"YES"*, given the tangible excess of current market ratios over their historical averages and even more – over fundamental ratios. Even if the higher average actual PE and PBV ratios of the last two decades and the more optimistic fundamental ratios (at a low current cost of equity) are taken, it still could be concluded that:

- There are strong arguments suggesting the presence of a bubble when comparing current PE and PBV with their long-term historical averages.

- Even more serious are the arguments for the existence of a bubble when comparing the current actual PE and PBV and the average actual PE and PBV from the beginning of this century until now, on the one hand, with the fundamental PE and PBV ratios, on the other hand.

The main factor for this situation is the unusually low cost of equity, mainly due to the Fed's policy of low-interest rates and quantitative easing, which has lasted for a decade, but has been exacerbated by the Covid crisis.

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INDUSTRIAL AND TRADE POLICY IN AGRICULTURAL ENGINEERING: RUSSIAN SPECIFICS AND PROBLEMS OF HARMONIZATION[5]

The purpose of the study is to develop a methodological approach to quantifying the degree of harmonization of industrial and trade policies in agricultural engineering.

The article analyzes the scientific approaches to the study of the problems of harmonization of industrial and trade policy. The authors reveal the specifics of industrial and trade policy in agricultural engineering in Russia, identify the imbalance between supply and demand in the industry, as well as systematize the main problems that prevent their harmonization. The authors propose a methodological approach to quantifying the degree of harmonization of industrial and trade policies based on the use of mathematical integration tools.

The developed methodology for calculating the integral index of industrial and trade policy harmonization allows us to quantify the degree of industrial and trade policy harmonization in agricultural engineering in order to obtain a generalized characteristic for diagnosing the industry situation and making informed management decisions in terms of eliminating the imbalance between the supply and demand of agricultural machinery. Diagnostics of the development of the industry using the proposed integral index is objective, since the integral index has a managerial value not in absolute terms, but in dynamics.

The practical significance of the study. The authors' recommendations can be used to justify the priority areas of harmonization of industrial and trade policies in agricultural engineering.

Originality/significance. The scientific understanding of the harmonization of industrial and trade policies is expanded by applying the author's approach to its

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quantitative assessment using the integral index of harmonization. This creates an additional information base for state regulation of the industry.
Research methods: critical analysis of monographic and periodical literature, general scientific research methods, historical and logical analysis, generalization, economic and static methods, system approach.
Keywords: industrial policy; trade policy; harmonization; agricultural engineering; organizational and economic conditions; integral index; indicators; mathematical statistics
JEL: L16; L52; O24; Q14

Introduction

Currently, the sustainable development of agricultural engineering is a priority direction of the state regulatory policy. The development of agricultural engineering contributes to the achievement of the goals of the policy of import substitution, the elimination of structural imbalances in both domestic and foreign markets, as well as the reduction of imbalances in the provision of agriculture with modern types of equipment.

The analysis of the development of the industry illustrates the main problems of state regulation of agricultural engineering. In the field of industrial policy, the current problems are: 1) excessive dependence of agricultural machinery manufacturers on state support; 2) insufficient financing of the agricultural engineering industry. It should be noted that the financing of agricultural machinery is mainly carried out at the expense of subsidies allocated from the Federal budget. In 2014, 1.9 billion rubles were allocated from the federal budget, in 2017, this figure increased to 15.7 billion rubles, and in the last two years, it decreased to 2 billion rubles (Butov, 2019); 3) the low level of effective demand in the market due to the lack of financial opportunities for agricultural producers.

In terms of trade policy, there are the following problems: 1) high level of localization of foreign agricultural machinery manufacturers in the Russian Federation (Claas – over 60%, John Deere – over 60%, Same Deutz-Fahr – 35%) (Rosagromash, 2016); 2) lack of stable effective demand for Russian agricultural machinery; 3) weak development of agricultural machinery exports.

According to the authors, these problems indicate the existence of an imbalance between the industrial and trade policies of the state. This imbalance should be identified in a timely manner. A tool for identifying this imbalance is a method for quantifying the degree of harmonization of industrial and trade policies.

Methodology

The purpose of the study is to develop a methodological approach to quantifying the degree of harmonization of industrial and trade policies in agricultural engineering.

The research hypothesis is based on the assumption that improving the quality of management decisions that determine the effectiveness of state regulation of the agricultural

engineering industry depends on the degree of harmonization of industrial and trade policies. Special methodological approaches are required to assess the degree of harmonization of industrial and trade policies.

The substantiation of the research hypothesis required the authors to analyze the existing methods of integration of particular indicators (the method of expert assessments, variance, correlation and regression analysis, methods of parametric statistics). The authors chose the method of correlation and regression analysis in relation to the available array of statistical data, which allows us to exclude subjective factors.

The statistics available for analysis are in the form of a panel sample (Cameron, Triverdi, 2015). The authors checked the presence of non-random (systematic) effects in each of the two available panels before their statistical processing as a single data set.

The study of the data for the presence of systematic effects was carried out by the method of time series analysis for stationarity. To obtain more accurate conclusions, the authors used the *F* and *t* criteria for checking the stationarity of time series, using the formula for calculating Student's *t*-statistics (1) and Fischer's *F*-statistics (2) (Afanasyev, Yuzbashev, 2001).

The formula (1) for calculating the Student's *t*-statistics:

$$t = \frac{\overline{X1} - \overline{X2}}{\sqrt{\frac{s1^2}{n1} + \frac{s2^2}{n2}}} \tag{1}$$

where $\overline{X}_1$, $\overline{X}_2$ – the arithmetic mean of the first and second half of the test series (data samples), respectively, S_1^2, S_2^2 – the standard deviations of the first and second half of the series under study, respectively, n_1, n_2 – the amount of data in the first and second half of the row, respectively.

Fischer's *F*-statistics are calculated using the formula (2)

$$F = \frac{S_1^2}{S_2^2}, \tag{2}$$

where S_1^2, S_2^2 – the standard deviations of the first and second half of the series under study, respectively.

The authors examined industrial policy indicators and trade policy indicators that are statistically related to the company's revenue. For this purpose, the authors used the method of correlation analysis (Ratner et al., 2014; Kleymenova, 2019). The Pearson pair linear correlation coefficients between all indicators are calculated using the formula (3):

$$r_{XY} = \frac{\sum\limits_{i=1}^{N}(x_i - \overline{x})(y_i - \overline{y})}{\sqrt{\sum\limits_{i=1}^{N}(x_i - \overline{x})^2(y_i - \overline{y})^2}} \ , \tag{3}$$

where N – number of values in the selection, X and Y – samples of the values of indicators between which the statistical dependence is investigated.

The authors evaluated the impact of each type of policy on the target indicator – the company's revenue-using two types of multiple linear models: the first model reflected the impact of industrial policy indicators on revenue, and the second model showed the impact of trade policy indicators.

The authors also used the method of multiple linear regression to construct an integral index of industrial and trade policy harmonization.

The final expression for the integrated index of industrial and trade policy harmonization (*IG*) was presented by the authors in the following form:

а) when calculating without taking into account inflation (in current prices)

$$IG = 0{,}5457*IP + 0{,}5092*ITR, \tag{4}$$

б) when calculated in base year 2010 prices

$$IG = 0{,}6456*IP + 0{,}4098*ITR, \tag{5}$$

where:

IP – sub-integral index of industrial policy;

ITR – sub-integral trade policy index.

The authors reflected the impact of the integral index of industrial and trade policy harmonization (IG) on the company's revenue using a linear regression model.

The authors also proposed a model for evaluating the impact of the integrated index of industrial and trade policy harmonization on the company's revenue in an interval form:

$$Rev = (1 \pm 0{,}8)*IG, \tag{6}$$

where *Rev* –revenue of the company in current prices

$$\text{or } Rev = (1 \pm 0{,}12)*IG, \tag{7}$$

where *Rev* – revenue of the company in the prices of the base year 2010.

Theoretical Basis of the Study

Rodrik (2004), Okuno-Fujiwara and Suzumura (1985), Otis and Graham (1994), Foreman-Peck and Frederico (1999), Davydova and Vavylova (2004), Danilov et al. (2014), Zavadnikov and Kuznetzov (2007), Idrissov (2016), Nikitin (2017), Sirotkina et al. (2017), Silova and Startseva (2005), Starikov (2017) made a significant contribution to the study of the mechanisms of formation and implementation of industrial policy.

Industrial policy, as an element of state economic policy, is interrelated and interdependent with its other elements, in particular with trade policy (Tonysheva, Mezhetskaya, 2016).

Various aspects of trade policy formation and management are reflected in the works of Jones (1996), Melvin (1987), Hindley and Smith (1984), Kotler and Keller (2014), Mezhetskaya and Mezhetskiy (2015), Obolensky (2016), Stankevich (2013), and others.

Harmonization of industrial and trade policies allows combining the interests of individual enterprises, the industry and the state as a whole. The combination of interests at all levels of the economic hierarchy leads to minimizing damage, even in times of crisis (Tsogoev et al., 2015).

List (2017) justified the need to harmonize industrial and trade policy instruments, while pointing out the priority of industry. Samuelson and Nordhaus (1997), Forster (1987), Tsogoev et al. (2015), Tonysheva and Mezhetskaya (2016), Smolyanova (2012), Sviridova (2016) also contributed to the development of problems of industrial and trade policy harmonization.

Currently, it is quite reasonable to believe that in the conditions of integration of Russian industry into global and regional markets, the sphere of circulation takes priority over the sphere of production, in contrast to the classical ideas of List (Shpak, 2009). In other words, trade is being globalized at a faster pace relative to the industry. This is because industries are more complex and slower to adapt to new markets. Nevertheless, the process of trade globalization is inextricably linked to the process of industrial globalization. Underestimation of harmonization in the economy threatens the asymmetric integration of domestic industry into the global market (Samuelson, Nordhaus, 1997).

In an open economy, it is necessary to ensure the harmonization of economic processes in industry and trade. At the same time, the objects of industrial policy should be the sphere of production, which will ensure integration into the global market and the sphere of circulation.

Thus, under the harmonization of industrial and trade policies, the authors understand the balance of economic relations between the state and business entities, focused on achieving high and sustainable results for both producers and consumers, in order to achieve the goals of import substitution.

This definition contains two theoretical clarifications: first, it takes into account the harmonization of relations not only between business entities, but also the state; second, it is focused on production and trade to achieve the goals of the import substitution policy.

To quantify the degree of harmonization of industrial and trade policies in the industry, it is possible to use methods of mathematical statistics and economic and mathematical methods.

Results

In the Russian economy, the conditions for conducting industrial and trade policies were constantly changing. As a result, the methods and forms of their implementation have changed many times. This led to inefficiencies and the emergence of new problems. Of course, these processes had their own specifics in different industries and industry complexes. In agricultural engineering, the process of harmonizing industrial and trade policies was complex and contradictory. There were stages when the state "abandoned" the industry to market-based methods of regulation, but there were stages when the state helped the industry with state methods and regulatory tools and got the corresponding result.

In recent years, there has been a negative trend in providing agriculture with the main types of agricultural machinery produced in Russia. On the contrary, the demand for its acquisition has a positive trend.

Table 1

Purchase of new and disposal of decommissioned agricultural machinery in agricultural organizations of the Russian Federation

Indicators	Year						Absolute deviation, 2018 from 2013	Growth rate, %, 2018 to 2013
	2013	2014	2015	2016	2017	2018		
Purchase of new agricultural machinery								
Tractors	8492	8595	7907	8082	8655	7889	-603	92.9
Harvesters:								
- grain harvesters	3220	3391	3263	3898	3706	3210	-10	99.7
- corn harvesters	24	37	70	29	19	20	-4	83.3
- forage harvesters	638	686	575	666	628	565	-73	88.6
- potato harvesters	76	111	92	70	85	84	8	110.5
Machines for sowing	4084	3822	4041	4677	4348	3028	-1056	74.1
Plows	2040	2232	2473	2854	2779	2158	118	105.8
Cultivators	3177	3259	3598	3878	3798	2932	-245	92.3
Sugar beet harvesting machine (without batobalani)	96	97	95	170	151	123	27	128.1
Milking machines and units (without irrigation systems)	1099	990	1040	749	685	622	-477	56.6
Disposal of decommissioned equipment								
Tractors	15193	14337	12277	10211	8848	8657	-6536	57.0
Harvesters:								
- grain harvesters	4614	4342	3731	3405	3048	2745	-1869	59.5
- corn harvesters	94	71	78	70	53	36	-58	38.3
- forage harvesters	1331	1166	1064	874	799	738	-593	55.4
- potato harvesters	138	162	118	105	120	118	-20	85.5
Machines for sowing	6732	7044	5908	5307	5153	4428	-2304	65.8
Plows	4260	4576	3430	3008	2902	2877	-1383	67.5
Cultivators	5808	5845	4848	4038	4196	4173	-1635	71.8
Sugar beet harvesting machine (without batobalani)	247	230	188	122	152	138	-109	55.9
Milking machines and units (without irrigation systems)	1501	1489	1159	982	882	892	-609	59.4

Source: compiled by the authors according to Selhoz-katalog (2020), Federal State Statistics Service of the Russian Federation (2018).

Table 1 shows the dynamics of the provision of agriculture with the main types of agricultural machinery of Russian production.

Analyzing the data in table 1, the authors conclude that the incoming new equipment does not compensate for the disposal of the decommissioned one. There are many factors that increase the need for agricultural producers to purchase new and high-quality agricultural machinery to replace obsolete ones. For example, only the first three days of cleaning pass without losses. Next, the grain begins to over-ripen, with every hour the losses grow, increasing by 1.5% per day. Therefore, the need for agricultural machinery, and hence the demand for it, may increase at this time (Avagyan, Kleymenova, 2013). According to academician I. Ushachev, one of the key indicators of the technical re-equipment of agriculture of the Russian Federation is the creation of an optimal machine-tractor park in the amount of 850-900 thousand tractors for the development of 30 million hectares of unused land, 200-250 thousand pieces of combine harvesters, 60 thousand units forage harvesters, increase energy availability per 1 ha of arable land up to 3 horsepower (Polukhin, 2014).

Insufficient equipment of agriculture with the main types of agricultural machinery of Russian production is compensated by the demand for equipment of foreign analogues. Foreign manufacturers offer a wider range of agricultural machinery, primarily combined machinery, replacing several types of agricultural machinery.

In order to determine the growth points of domestic agricultural machinery production, the authors analyzed its structure by types imported to the Russian Federation (Table 2).

Table 2

Import of agricultural machinery to Russia by type

Indicators	2014		2015		2016		2017		2018	
	units	millions of dollars	units	millions of dollars	units	millions of dollars	units	millions of dollars	units	millions of dollars
Combines, total, of them:	2996	127,823	2051	56,399	1976	104,811	2544	163,274	2580	169,335
harvesters	208	39,894	88	15,366	119	19,357	438	62,967	524	79,644
forage harvesters	166	22,203	78	8,327	45	7,306	157	19,456	167	25,842
grape harvesters	4	1,119	2	0,282	2	0,399	2	0,373	4	0,992
for harvesting tubers and root crops	2618	64,607	1883	32,424	1810	77,749	1947	80,478	1885	62,857
The caterpillar tractors	no data	no data	22,5	9,6	28,7	34,8	no data	no data	22.5	9,6
Harvesters	no data	128,9	62.3	105,9	164,3	170,6	no data	128,9	62.3	105,9
Spare parts	no data	no data	190.9	279,8	231	no data	no data	no data	190.9	279,8
Equipment for agriculture	no data	no data	570	547,2	440	no data	no data	no data	570	547,2
Agricultural adapters	no data	358,0	268.7	372	394	no data	no data	358,0	268.7	372

Source: compiled and calculated by the authors according to Selhoz-katalog (2020).

In 2014, imports of combine harvesters amounted to 208 units in physical terms. (6.9% of sales) in 2018 – 524 units (20.3% of sales). Imports of forage and grape harvesters in physical terms for the analyzed period remained almost unchanged. Production of grain and forage harvesting equipment is actively developing in Russia, so the share of imported equipment is low compared to the share of imported combines for harvesting tubers and root crops.

In 2014, $64.607 million was spent on providing the Russian agro-industrial complex with combines for harvesting tubers, and in 2018 – $ 62.857 million. These funds could have remained in the country if the production and support of these types of agricultural machinery had been organized in Russia.

The authors pay special attention to the agricultural equipment market, which accounts for about 50% of all imports.

The largest share in import costs (35.0% in 2017) is the purchase of equipment for the agricultural sector. Agricultural adapters (ploughs, seeders, harrows, mowers, etc.) are in second place, in 2017, the volume of imports of agricultural adapters amounted to $394 million, compared to $268.7 million in 2015. Spare parts for agricultural machinery are in third place, with imports totalling $190.9 million in 2015 and $231 million in 2017 (Bayanduryan et al., 2019).

The authors noted that imports of combine harvesters and crawler tractors in value terms increased significantly with a significant reduction in the physical volume of imports. This fact indicates an increase in prices for these types of agricultural machinery in the world.

The analysis of the import of agricultural machinery in the Russian Federation allowed the authors to systematize the types of agricultural machinery that need to be developed in Russia (Table 3).

Table 3

Systematization of agricultural machinery, that need to be developed in Russia

The leading positions of the Russian manufacturers	Production in Russia in limited quantities	There is no production in Russia
Combine harvester	Self-propelled sprayers	Tractors for gardening and viticulture
Tractors with a capacity of more than 300 HP	Tractors 20-80 HP, 80-130 HP, 130-180 HP, 180-300 HP	Most segments of equipment for animal husbandry (including for loose keeping)
Tillage and sowing equipment	Precision farming equipment	Telehandler
Elevator and grain cleaning equipment	Machines for fertilizer application	Self-propelled beet harvesters
Equipment for forage harvesting (mowers, balers, etc.)	Irrigation equipment	

Source: compiled by the authors according to Selhoz-katalog (2020).

The Russian Federation has a low availability of the following types of equipment: agricultural tractors, especially small-sized, traction class 0.6, 0.9, 1.4, 2, 3, 5 and higher; beet harvesters (import share 100%); gardening and viticulture equipment; milking machines and equipment, forage harvesting equipment; machines, installations, sprinkler and irrigation devices, pumping stations; self-propelled roller reapers and mowers; machinery and

equipment for animal husbandry. The import substitution program should be developed specifically for these types of products.

Competition from the largest foreign manufacturers of agricultural machinery is a factor that encourages the development of domestic production not only for import substitution, but also for the formation of exports of Russian agricultural machinery. It requires the development of innovative models and a range of services for their technical and after-sales service.

Illustrating the imbalance between supply and demand in the Russian agricultural machinery industry allowed the authors to systematize the main problems that hinder the achievement of harmonization:

1. *Dependence of agricultural machinery manufacturers on state support at the federal and regional levels.*

Financing of agricultural machinery is carried out by providing subsidies from the state budget. It should be noted that the conditions for receiving state subsidies are unstable, for example, in terms of rates, which were constantly changing in 2015 and 2017.

Indeed, agricultural engineering companies are experiencing an acute shortage of their own financial resources, which are not enough for innovative development. This is why companies depend on government subsidies and other government assistance.

The issues of formation and management of the company's financial resources are of particular relevance. They determine the financial performance of the enterprise, and, therefore, its investment and innovation opportunities (Forster, 1987).

The study was conducted on the example of two of the largest companies in the industry that produce agricultural machinery in the Krasnodar region. The question of the effectiveness of the use of financial resources will be considered on their example.

The choice of these enterprises was not random, the authors defined the selection criteria:

- scale of production;
- innovative activity;
- participation in international exhibitions;
- supply of products to the domestic and foreign markets;
- participation in state programs.

Table 4 shows the calculations of the efficiency of the use of financial resources by Company 1 and Company 2.

Indicators for evaluating the level of efficiency are the following indicators: return on sales, return on assets, return on equity. Table 4 shows that the profitability indicators of Company 1 for the analyzed period had a growth trend. The return on assets increased from 0.46% to 5.458%. The increase in this indicator was due to the growth of the company's net profit. The return on equity increased from 0.52% to 5.91%. The positive dynamics of this indicator is important for the company's investors, as it characterizes the profit that the owner will

receive from 1 ruble of investment in the company. The increase in the return on invested capital allows us to draw a conclusion about the effective investment of funds in the main activity of the company. During the analyzed period, the profitability of production increased from 4.743% in 2013 to 8.625% in 2017. The growth of this indicator was due to a reduction in the cost of production and profit growth.

Table 4

Analysis of the effectiveness of the use of financial resources

Indicators	2013	2014	2015	2016	2017	2018	Absolute deviation, 2018 from 2013	Growth rate, %, 2018 to 2013
Company 1								
Revenue, thousand rubles	334947	218869	340762	362244	262404	299672	- 35275	89.5
Cost price, thousand rubles	271736	186151	249050	245897	194150	239051	- 32685	87.9
Commercial expenses, thousand rubles	23574	18204	18841	24309	25154	36849	13275	156.3
Management expenses, thousand rubles	26748	20568	26279	28568	26354	43630	16882	163.1
Profit from sales, thousand rubles	12889	-6054	46592	63470	16746	-19858	-	-
Profit (loss) before tax, thousand rubles	3627	12481	47832	93872	35678	28173	24546	by 8 times
Net profit, thousand rubles	2145	7869	32244	67001	26333	22106	19961	by 10times
Return on sales, %	3.848	-	13.673	17.521	6.382	-	- 3.848	-
Return on assets, %	0.460	1.922	8.258	17.043	6.457	5.458	4.998	by12 times
Return on equity, %	0.529	2.091	13.156	19.479	7.260	5.910	5.381	be 11times
Return on invested capital, %	0.894	3.316	13.861	27.291	9.837	7.532	6.638	by 8 times
Profitability of production, %	4.743	-	18.708	25.812	8.625	-	- 4.743	-
Company 2								
Revenue, thousand rubles	195797	173201	247436	353807	363130	296100	100303	151.2
Cost price, thousand rubles	136109	111526	148512	243569	151233	251039	114930	184.4
Commercial expenses, thousand rubles	-	-	-	-	-	-	-	-
Management expenses, thousand rubles	75343	69886	89400	151001	226786	77330	1987	102.6
Profit from sales, thousand rubles	-15655	-8211	9524	-40763	-14889	-32269	-	-
Profit (loss) before tax, thousand rubles	-19890	-14117	22045	13036	-1293	1057	-18833	-
Net profit, thousand rubles	-19890	-14117	22045	11604	-1462	497	-19393	-
Return on sales, %	-	-	3.849	-	-	-	-	-
Return on assets, %	-	-	13.423	6.072	-	-	-	-
Return on equity, %	-	-	20.811	9.453	-	-	-	-
Return on invested capital, %	-	-	20.811	10.620	-	0.830	-	-
Profitability of production, %	-	-	6.413	-	-	-	-	-

Source: compiled and calculated by the authors.

It should be noted that the maximum values of the indicators of the efficiency of the use of financial resources of Company 1 are observed in 2015-2016.

Thus, during the analyzed period, the indicators of the efficiency of the use of financial resources of Company 1 had a positive trend, but it is not possible to compare them with the

indicators of Company 2, since they were not calculated due to the negative values of the indicators required for the calculation.

Thus, the analysis of the use of financial resources of agricultural machine-building companies in the Krasnodar region allows the authors to conclude that the companies are ready to accept measures of state support for the agricultural machinery industry within the framework of industrial and trade policy. In addition, companies have a need for additional resources necessary for investment and innovation development. It is necessary to develop the competitive advantages of Russian agricultural machinery in order to minimize the share of imports.

Thus, the reduction in the effectiveness of state support for agricultural machinery manufacturers leads to a restriction of the ability of agricultural machinery manufacturers to produce modern, competitive and high-performance equipment. In turn, there is a slowdown in the renewal of the fleet of agricultural machinery from agricultural producers.

In addition, the authors note the lack of financial resources among farmers. For example, in 2018, the volume of state support for agriculture from the federal budget amounted to 238.7 billion rubles, but this is not enough for the development of the industry. For comparison, 863 billion rubles were allocated for the transport industry, 538.2 billion rubles for the road sector, and 363.7 billion rubles for applied scientific research in the field of the national economy (Consultant, 2020). The lack of financial resources leads to the fact that only large enterprises can afford new equipment, while other agricultural producers can only buy used agricultural equipment or rent it.

The main measure of state support for agriculture is currently the mechanism of concessional lending, which is also not sufficiently effective. This mechanism can only be used by large agricultural holdings, and small agricultural producers do not use this mechanism due to the lack of funds allocated from the federal budget (Avagyan and Kleymenova, 2013).

2. *Low effective demand for Russian machinery within the country against the background of an increase in the share of localization of foreign agricultural machinery manufacturers operating in the Russian Federation*

The demand for agricultural machinery primarily depends on the economic and production stability of agricultural enterprises. The presence of systemic problems in the agro-industrial complex (disparity of prices for final agricultural products and prices of agricultural production factors; high competition with imported suppliers of agricultural products; lack of qualified personnel in agriculture; low profitability of production) leads to a lack of own funds for the purchase of new machinery and equipment.

Foreign producers with a degree of localization on the territory of the Russian Federation of more than 50% have the opportunity to use state support tools on an equal basis with domestic producers of agricultural machinery. Naturally, in most cases, they displace Russian companies. In addition, the priority of choosing imported agricultural machinery is due to the technical and innovative lag of domestic equipment.

3. The problem of entering foreign markets

The system of state export support in Russia is unsatisfactory. In addition to the existing measures of state support (export credit, insurance, state guarantees), it is necessary to reduce the tax burden, make credit resources more accessible, improve the business climate, create high-quality service in foreign countries (world-class logistics, local warehouses, service centers). The low level of exports does not create effective incentives for competition in foreign markets, which, in turn, negatively affects the competitiveness, technical and innovative level of Russian-made agricultural machinery.

The authors propose a methodological approach to quantifying the degree of harmonization of industrial and trade policies in order to eliminate existing problems and make informed management decisions at the macro and micro levels.

The first stage of the author's methodological approach is the justification of indicators that can be used at the enterprise level to quantify the effects of industrial and trade policies, in other words, to assess the harmonization of these areas (Figure 1).

The authors refer to indicators of industrial policy as indicators that characterize the company's production activities:

1) The growth in production.

2) The share of top-quality products in the total output of products produced. The quality cannot be separated from the quantity of products. To analyze the quality of all products, enterprises calculate a General indicator that shows the share of the most significant products in the competitive market in the total production volume. Quality indicators characterize the compliance of product properties with the requirements of a specific customer, consumer market, and regulatory documents that consumers can refer to. When producing products, it is necessary to take into account the production and consumer properties of products. At the stage of product development, production properties are formed, which are achieved at the manufacturing stage. Consumer properties of products are aimed at meeting consumer demand.

3) The share of innovative products in the total output of products produced. Enterprises need to develop and increase their sensitivity to innovation in the production of agricultural machinery in order to increase consumer demand for their products. An innovative approach in the production of agricultural machinery is the basis for sustainable development and allows the company to gain competitive advantages in the market.

4) The share of products for export in the total output of products produced. Export of agricultural machinery products is one of the drivers of production growth, which allows not only to increase sales, but also to diversify risks, thereby increasing the sustainability of producers. Therefore, an increase in the share of products for export in the total volume of production can also characterize industrial policy: it is necessary to increase not only the volume, but also expand the structure of export supplies, on which the sustainability of the development of domestic agricultural machinery depends.

Figure 1

Methodological approach to assessing the degree of harmonization of industrial and trade policies in the industry
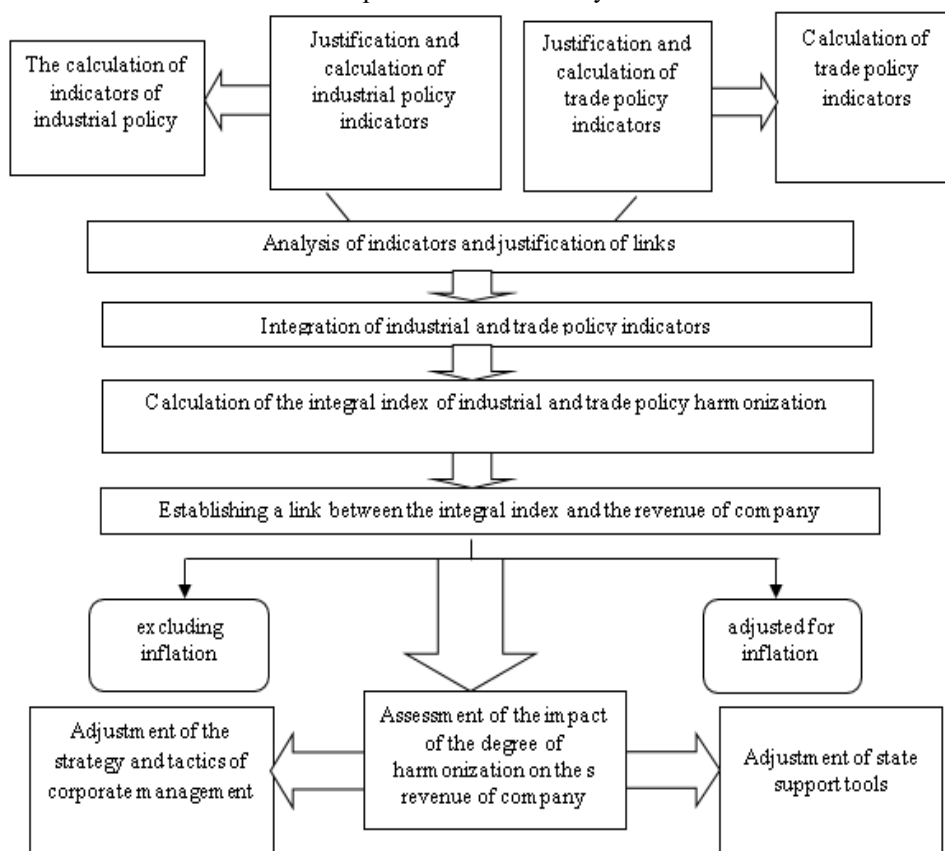
Source: compiled by the authors.

The choice of these indicators is not random. In the federal law "On industrial policy in the Russian Federation" highlighted the priorities in the implementation of industrial policy of the country: the increase in output of products with high added value and support of exports; promotion of stakeholders to implement into production the results of intellectual activity and development of production of innovative products (Consultant, 2019).

The following indicators are considered as indicators of trade policy by the authors:

1) The revenue growth rate. Revenue from sales is the main evaluation indicator of the effectiveness of the company's trade policy. Its volume indicates that the products produced are sold, that is, they meet the market demand in terms of assortment, quality, price and volume. Revenue from sales is a source of covering the current costs of production and sales of products, forms the profit of the organization. Timely receipt of revenue affects the financial

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stability and solvency of the organization, its profit, timely payments to suppliers, personnel, banks, budget and extra-budgetary funds. Late receipt of revenue leads to a delay in payments for raw materials, materials, electricity, etc., which as a result leads to a loss of profit for the supplier and complicates the work of related enterprises.

2) The ratio of product sales prices in the domestic and foreign markets. The indicator of trade policy for an economic entity is the price policy, since the level of set prices depends on the volume of sales and profit. Justification of the organization's pricing policy is due to the fact that by setting a certain price for its products in the market, the organization can maximize its market share, thereby increasing the amount of profit. Prices on the domestic and foreign markets may differ significantly depending on the industry. The enterprise will choose the market based on its corporate interests, and the state should regulate the markets with the help of trade policy (including price). According to the authors, an indicator of trade policy can be the ratio of internal and external prices, which is defined as the ratio of the internal price of a particular product to its external price.

3) The coefficient of territorial sales diversification. By territorial diversification, the authors understand the totality of supply regions, taking into account the distance, and also suggest calculating the coefficient of territorial diversification. Indeed, enterprises may pursue different territorial policies, and the state may use various tools to influence them.

All indicators are calculated according to the objects of the study and are shown in Tables 5 and Table 6. It should be noted that these indicators are of an industry nature and can be used by other enterprises in the industry.

The indicators that can be used to assess industrial policy are presented in Table 5.

Table 5

Industrial policy indicators (%)

Indicator	Year					
	2013	2014	2015	2016	2017	2018
Company 1						
The growth in production volumes	72.3	64.8	117.2	102.9	105.0	140.1
Share of top-quality products in total output	98.1	99.4	99.9	99.8	99.7	97.1
Share of innovative products in total output	79.1	65.2	56.4	48.6	57.9	57.7
Share of products for export in the total volume of products produced	8.6	10.1	12.6	8.9	9.7	3.5
Company 2						
The growth in production volumes	70.9	97.8	138.2	197.4	111.8	146.9
Share of top-quality products in total output	73.3	67.1	80.8	70.4	86.6	70.3
Share of innovative products in total output	18.8	24.9	28.5	31.6	61.8	37.6
Share of products for export in the total volume of products produced	2.6	4.7	3.1	2.2	5.5	6.5

Source: compiled by the authors.

The indicators that can be used to evaluate trade policy are presented in Table 6.

Table 6

Trade policy indicators

Indicator	Year					
	2013	2014	2015	2016	2017	2018
Company 1						
Revenue growth rate, %	83.2	65.3	155.7	106.3	72.4	114.2
Ratio of product sales prices in the domestic and foreign markets	1.2	1.1	1.4	1.4	1.3	1.2
Coefficient of territorial sales diversification	0.1	0.04	0.05	0.04	0.08	0.06
Company 2						
Revenue growth rate, %	105.9	88.5	142.9	142.9	102.6	81.5
Ratio of product sales prices in the domestic and foreign markets	1.4	1.2	1.3	1.7	1.6	1.1
Coefficient of territorial sales diversification	0.1	0.1	0.08	0.05	0.08	0.14

Source: compiled by the authors.

All the considered indicators of industrial and trade policy are directly or indirectly related. The authors identify four indicators among the presented indicators of industrial and trade policy that characterize the process of harmonization of industrial and trade policies:

1) Share of innovative products.

2) Share of products for export.

3) The ratio of product sales prices in the domestic and foreign markets.

4) The coefficient of territorial sales diversification.

All four indicators characterize the harmonization of the results of the state's industrial policy (aimed at increasing market demand and achieving the goals of the import substitution policy) with the trade policy (aimed at regional sales volumes), since the state can influence the price level, thereby increasing or decreasing demand for these products.

All these indicators affect the organization's revenue, so the authors selected sales revenue as the target function for quantifying the degree of harmonization of industrial and trade policies. These indicators can be used to assess both the effectiveness of harmonization and the effectiveness of state support measures.

Justification of indicators of industrial and trade policy harmonization is an important element of the authors' methodological approach. However, it is difficult to make management decisions without a more informative integral indicator.

In accordance with the methodology proposed by the authors, the presence of non-random (systematic) effects was checked in each of the two available panels- data on Company 1 and Company 2. The study of the data for the presence of systematic effects was carried out by the method of time series analysis for stationarity. To obtain more accurate conclusions, the authors used the *F* and *t* criteria for checking the stationarity of time series, using the formula for calculating Student's *t*-statistics and Fischer's *F*- statistics (formula 1 and 2).

The calculation of the Pearson pair linear correlation coefficients between all indicators allowed the authors to determine which of the industrial policy indicators and trade policy indicators are statistically related to the company's revenue. The calculations showed that the

correlation coefficients between revenue and the studied indicators of industrial and trade policy of enterprises have changed insignificantly.

Using a two-type multiple linear regression model to assess the impact of industrial and trade policy indicators on revenue, the authors proved that each of the constructed sub-integral indices approximates the target parameter well only in a certain sample area, while the differences were significant in other areas. This confirmed the hypothesis put forward by the authors that indicators of industrial policy and separately indicators of trade policy cannot adequately approximate the company's revenue: some combination of them is needed. The authors used the method of multiple linear regression to construct the integral index of industrial and trade policy harmonization (Formula 4 and 5). The calculated values of the integral index of industrial and trade policy harmonization are given in Table 7.

Table 7

Values of the integrated index of industrial and trade policy harmonization

Company 1		Company 2	
IG in current prices	IG in 2010 prices	IG in current prices	IG in 2010 prices
380335,5755	316996,8675	203212,8737	139300,7883
379157,0477	311551,4735	202384,9664	134798,2714
377510,1458	309142,2674	203447,5305	135210,3165
378401,591	309124,1958	199003,2913	136122,148
337763,7617	261193,8006	187874,8629	128596,6682
362194,7129	256961,0569	231487,5435	168537,9404
325310,3642	236097,8121	300982,1741	221511,2861
321696,5477	240482,8554	358124,6811	283118,5556
298387,1951	247626,5667	191307,0748	138541,7857

Source: compiled by the authors.

The final stage of implementation of the author's methodology is the formation of a linear regression model that reflects the impact of the harmonization index on the company's revenue (Figure 2).

The conducted research has shown that the approximating ability of the constructed harmonization index is quite high. Significant differences in the values of the harmonization index and revenue are observed only for those values of the initial sample that correspond to the crisis years and can be considered as outliers.

In the interval form, the models for assessing the impact of the constructed integral index of industrial and trade policy harmonization on the company's revenue are presented using formulas 6 and 7.

This model allows to evaluate the results of the harmonization of industrial and trade policies at all levels: the state, industry, and company. Analysis of the impact of the industrial and trade policy harmonization index on the company's revenue will increase the validity of management decisions.

Figure 2

Approximation of the target indicator (revenue) by the calculated value of the harmonization index (taking into account inflation)
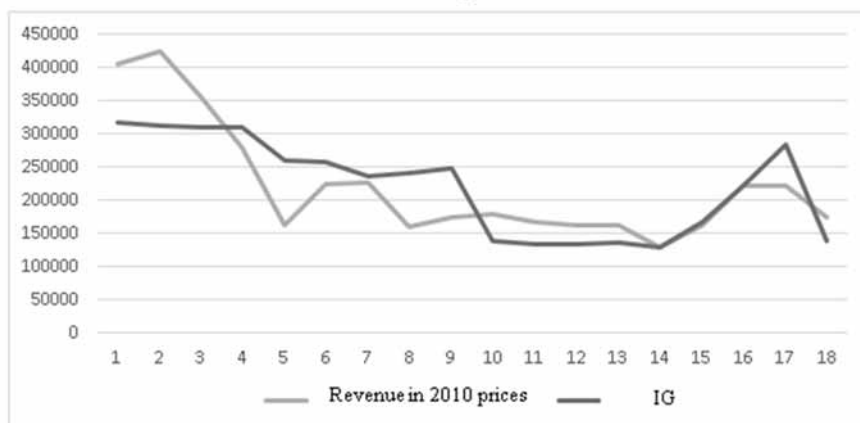
Source: compiled by the authors.

Compliance with the harmonization of industrial and trade policies becomes a significant factor that affects the financial position of enterprises. This is due to the fact that the inconsistency and unbalance of the interests of the state and agricultural machinery enterprises can negatively affect the processes of technical and technological modernization of both producers and consumers of agricultural machinery (Smolyanova, 2012).

Conclusions

The study of theoretical approaches to the harmonization of industrial and trade policies in agricultural engineering, the analysis of the development of the agricultural engineering industry in the Russian Federation showed the existence of an imbalance between the production of agricultural engineering products and the needs of agricultural producers.

The article shows that the decline in production and sales of modern, competitive agricultural machinery of domestic production hinders the innovative and technological renewal of agricultural enterprises. In addition, there is a risk of capture of the market of agricultural machinery by foreign manufacturers.

The system of indicators was chosen as the basis of a methodological approach for assessing the degree of harmonization of industrial and trade policies in agricultural engineering.

The use of the integral index allows us to give a quantitative characteristic of the degree of harmonization based on the use of a multiple linear regression model. The proposed methodology allows us to quantify the degree of harmonization of industrial and trade policies at all levels of management and can be used to make informed management decisions.

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Bozhidar Hadzhiev[1]

MODERN TRANSFORMATIONS IN THE ECONOMIC ACTIVITY[2]

In today's dynamic, electronic and open market world, the focus is on transformations of policies, strategies, systems, models and mechanisms related to the entrepreneurial and innovation potential of the business for effective management of the changes. This direction requires adequate analyses, assessments and control of the entrepreneurial and innovation potential through the prism of an overall view of the changes providing balanced benefits for the business, as well as for the nature and society. The more and more complex and fast transformations of the business require answers to the following questions:

- *What priorities and where should the analysis and control be focused on?*
- *What is the update of the algorithms and the technologies for analysis and control?*

For some answers to these questions, developed and recommended are:

- *algorithm of a modern system for analysis and control in four main directions (value qualities of the subject; quality of the situation of current work or future work; quality of work, activity; quality of the result of the activity);*
- *model for proactive analysis (GS1 system standards are combined with certain QMS standards);*
- *model for analysis and assessment of the entrepreneurial and innovation potential of the enterprises;*
- *algorithm of process innovations in the relation "business – circular economy – complex reengineering";*
- *model of digital infrastructure for the interrelation of the economic entities.*

Keywords: business prevention; complex reengineering; GS1; ISO 14 000; digital infrastructure
JEL: L21; L25; L53

Every society is established to serve the **great goal** – preservation of human life, freedom, creative tension, and property, and to provide the necessary means, political power, laws and courts. This requires, above all, appropriate approaches and methods of management at each level.

Modern management approaches, such as those of open information relations and complex reengineering (CR), could stop or slow down many of the negative development trends.

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However, in order to apply these methods effectively, a suitable environment and business prevention are needed.

The modern environment suffers many and intertwined problems, many of which are unsolvable.

Often, we rush to solve every single problem, but this is not possible and not necessary. Through the complex reengineering, we reveal that we have to work for overcoming the following main groups of problems:

- **Inadequacy of the actions with the ongoing processes of the open economy**, causing many of the negative problems and development trends, including those concerning the growing shortage of energy needed to maintain the comfort and balance that provides benefits to business, society and nature.

- **Damaged moral foundations of the personality and lack of methods and technologies for building and improving current moral foundations is another main problem in the management of the changes.**

- **Perfectionism** has become a main disease in the small business management. There is almost no mention of success, constructiveness and creativity. The price perfectionism in the economy pays is the decline in productivity. There are communication problems, health problems (blocking the activities, especially of small businesses, is accompanied by anxiety and inferiority).

- **Reflection in management** is in some elementary rudiment. Mutual understanding means in your thoughts to put yourself in the other person's shoes, to see and play the situation from his/her point of view and position. Respecting your partner's dignity is an extremely important skill. Is this applied in the drafting of regulations and laws concerning the interests of citizens and organizations? The rating position of the professional reflection is still very low.

- **Damaged foundations of social protection of the population** and lack of methods and technologies for their transformation become a very big problem. It can start with changes in the values and the economic activity of TNCs, banks and energy and water suppliers, which control the market shelves and the main cash flows. Previous studies of scientists from the Economic Research Institute at the Bulgarian Academy of Sciences reveal that this problem is extremely important for the economic policy and for balanced relations in the business.

- **Development of the accompanying** grey and black economy and the related technologies of seizure, suction, fraud, etc., grow.

- **Emergence and development of the system of organized crime and terrorism** and the merging of part of the socio-ideological and political status of the society and certain economic and political circles with it becomes a main problem related not only to the corruption. Power and politics become a territory for enrichment.

- **Status of the microeconomic units and the market infrastructure is a problem.**

- **Demographic crisis and depopulation of the villages** in countries like Bulgaria become a serious barrier to effective economic, social, educational, health and cultural policies.

- **Main problem is the management of the quality of education, science and entrepreneurial and innovation potential.**

Many of the mentioned problems have been outlined years ago by scientists from the Economic Research Institute at the Bulgarian Academy of Sciences and specialists at the Bulgarian Chamber of Commerce and Industry (BCCI), but unfortunately they have not been solved yet. For example, back in 2014, Prof. Mitko Dimitrov has pointed out that "the source of economic growth in Bulgaria should be sought in solving the problems with high levels of corruption, hostile business environment, low-quality services in the judiciary and administration, misuse of natural resources, and demographic crisis" (Dimitrov, 2014).

The interrelation of the mentioned problems outlines three intertwined socio-ideological and economic statuses of the legal, grey and terrorist and criminal economy. The negatives of these statuses are mainly manifested in the less developed countries. There, the ineffectiveness of the management mechanisms and the control and regulation systems create perfect personal marking, not problem regulation. "I deserve" policy, "taking" policy, and bad conditions for the small business dominate, slowing down the legitimate initiatives and creativity. In many cases, the political, legislative and judicial power are inadequate and gradually create a society with criminal intentions, where true entrepreneurship and innovations are neglected. There, the poorer and smarter people are the first to start paying and suffering, and with that, the state system gradually dies. Then everyone else starts paying and suffering. The preservation of the people and the right of every person to do what he/she should absolutely do are neglected. The defining of the situation through complex reengineering reveals that the more and more complex and fast transformations of policies, strategies, systems, models and mechanisms related to the entrepreneurial and innovation potential of the business for effective management of the changes, require the analysis and control through appropriate algorithms and technologies to focus on solving the mentioned main problems. One could start with the approaches outlined in the monograph "Reasonable Management – Reengineering" (Hadjiev, 2000c; as well as Hadjiev, 2000a, pp. 130-135; Hadjiev, 2000b, pp. 135-142). Instruments in these approaches are:

- algorithm of a modern system for analysis and control in four main directions (value qualities of the subject; quality of the situation of current work or future work; quality of work, activity; quality of the result of the activity);

- model for proactive analysis (the standards of the GS1 system are combined with certain standards of QMS);

- model for analysis and assessment of the entrepreneurial and innovation potential of the enterprises;

- algorithm of process innovations in the relation "business – circular economy – complex reengineering";

- model of digital infrastructure for the interrelation of the economic subjects.

The establishment of good governance in Bulgaria has been and is the focus of many scientists (Dimitrov, 2007; Karapchyan, 2007; Beleva, Dimitrov, 2013; Dimitrov, et al., 2014; Dimitrov, 2017; Tanev, 2018; Dimitrov, et al., 2019).

The focus here is on the mechanisms for applying the algorithms and standards for good governance in Bulgaria.

The modern controlling system harmonizes with the main directions for quality management (QM) in the model for complex reengineering (Figure 1).

Figure 1

Technology for forming and developing a modern controlling system in accordance with the main directions of the QM reengineering model
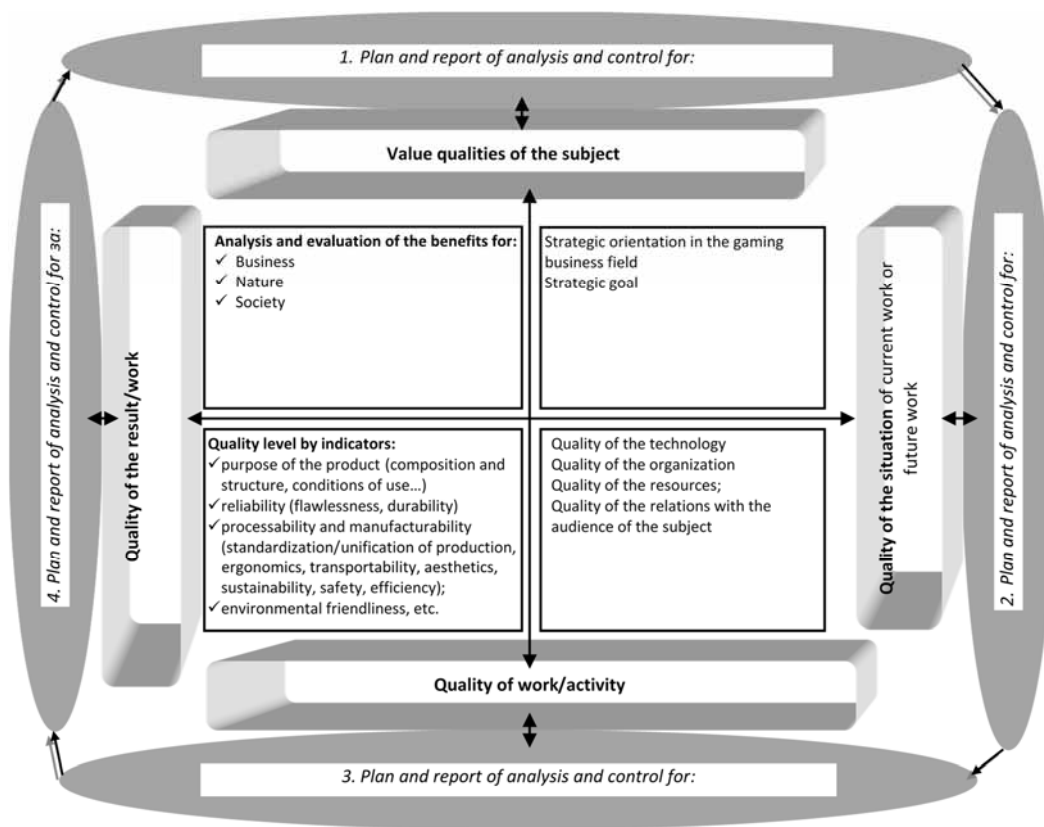
For the enterprises, extremely important is the motivation for forming and developing QMS and the related technologies according to the main orientations for quality management, as well as the level at which the respective change of the processes and products is initiated. The motivation for certain behaviour of the enterprises concerning the control forms different behaviour depending on whether the control is exercised by an external institution or whether

the enterprise has the freedom and potential to form and develop a modern "controlling system".

Another CR instrument that affects the four groups of quality processes is the one that integrates ISO 14000 standards and the GS1 System of Standards.

The proactive model for analysis through integration aims to provide the subjects with an instrument to deal with the barriers to quality affecting the management system of the environment, assessment of the organizations, assessment of the production, information and quality of storage, transportation and sales.

Figure 2

Integrative proactive model of ISO 14000 and GS1 quality management standards
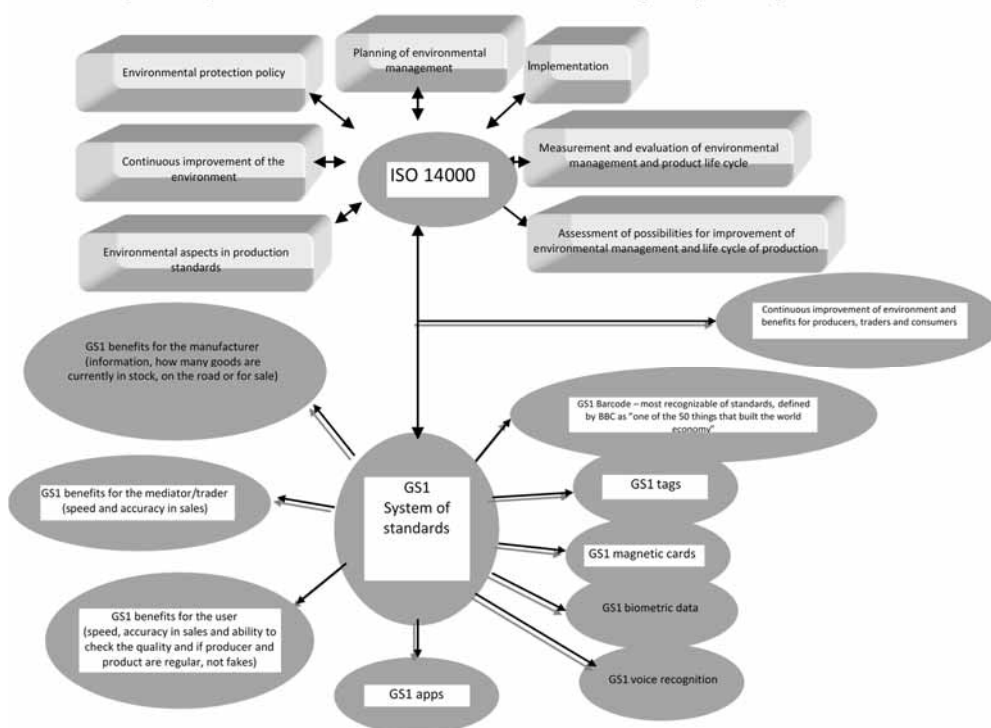
ISO 14000 system of standards provides opportunities for management of the environment through the prism of assessments of the organization and the production.

GS1 System of Standards provides a standardized approach for identifying sales and logistics units and locations, capturing traffic data along the chain and sharing this data within the company and between the business partners.

CR provides opportunities to address quality barriers and other combinations of the GS1 system and the ISO system of standards.

The model for analysis and assessment of the entrepreneurial and innovation potential of the enterprises is the third instrument that can be used by the subjects.

Without claiming to be exhaustive, such an exemplary model for such an assessment is proposed through the prism of CR (Figure 3).

Figure 3

Model for assessing the entrepreneurial and innovation potential of the enterprises

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Block 1. **Current significance of the entrepreneurial and innovation activity for the subject**

A. *Determining the current entrepreneurial and innovation activity for the subject on a basis of:*

- significance of revenues from the entrepreneurial and innovation activity for the subject $S_{rev} = \dfrac{Revenues\ from\ entrepreneurial\ and\ innovation\ activity\ (Rev_{eia})}{Total\ revenues\ of\ the\ subject\ (Rev_t)}$

- significance of profitability of entrepreneurial and innovative activity $S_{prof} = \dfrac{Profit\ from\ entrepreneurship\ and\ innovation\ (Prof_{eia})}{Rev_{eia}}$

- significance of return on assets from entrepreneurial and innovation activity $S_{ra} = \dfrac{Rev_{eia}}{\sum assets\ from\ entrepreneurial\ and\ innovation\ activity\ \ x\ S_{prof}}$

- significance of investments for entrepreneurial and innovation activity of the subject $S_{inv} = \dfrac{\sum investments\ from\ entrepreneurial\ and\ innovation\ activity}{Rev_t}$

- assessment of an existing program for the development of entrepreneurial and innovation activity. It is recommended that the program be linked to interventions in the relation "business – circular economy – CR"

- assessment of available organizational structures, systems, models for activation of participants in entrepreneurial and innovation activity of the subject

- assessment of available regulatory requirements and measures to promote entrepreneurial and innovative activity in the subject

- assessment of the share of entrepreneurial and innovation activity in the vision, mission and the overall strategic program for management of the subject

B. *Ranking of the values of the indicators by the studied subjects.*

Block 2. **Assessment of capacity for entrepreneurial and innovation activity of the subject**

A. *Assessment of the organizational capacity:*

- capacity for effective internal and external communications of the subject related to the entrepreneurial and innovation activities;

- availability of sustainable sources and structures in the subject for generating entrepreneurial and innovation ideas;

- availability of sustainable sources for financing entrepreneurial and innovation ideas;

- availability of sustainable sources and structures for attracting, training, motivating and stimulating the staff related to the implementation of the program for the development of the entrepreneurial and innovation activity of the subject;

B. *Assessment of the digital capacity:*

- assessment of the digital infrastructure of the subject;

Block 2. Assessment of capacity for entrepreneurial and innovation activity of the subject

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- o assessment of the digital culture of the managers;
- o assessment of the digital culture and digital knowledge of the participants in the program for development of the entrepreneurial and innovation activity of the subject;
- o assessment of the used practices and digital technologies for entrepreneurial and innovation activity;
- o assessment of the share of the digital activity of the subject in its total activity;

C. *Assessment of the partner capacity:*
- o assessment of the partnership relations for entrepreneurial and innovation activity with business organizations;
- o assessment of the partnership relations for entrepreneurial and innovation activity with branch organizations;
- o assessment of the partnership relations for entrepreneurial and innovation activity with higher schools and scientific organizations;
- o assessment of the partnership relations for entrepreneurial and innovation activity with clubs and innovators' structures;
- o assessment of the partnership relations for entrepreneurial and innovation activity with clubs and investors' structures;

D. *Assessment of the financial capacity:*
- o assessment of the capital structure;
- o assessment of the budget for entrepreneurial and innovation activity;
- o assessment of the used mechanisms and instruments for financing the entrepreneurial and innovation activity;
- o assessment of the potential for the use of modern technologies such as crowdfunding, etc., to finance entrepreneurial and innovation projects;

E. *Ranking of the values of the indicators by the studied items and subjects.*

Block 3. Assessment of impact of entrepreneurial and innovation interventions of the subject

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A. *Assessment of the change in the industrial and social significance of the subject:*
- o based on profitability;
- o based on the return of the assets;
- o based on investments of the enterprise in nature protection;
- o based on the capital structure of the enterprise – relative share of own capital (OC) in the total financial resource (TFR);
- o based on social image and CSR;

B. *Assessment of the degree of implementation of the program for the development of entrepreneurial and innovation activity;*

C. *Assessment of the degree of improvement of the expert and human resources potential for entrepreneurial and innovation activity based on participation on the market for innovations and intellectual products;*

D. *Ranking of the values of the indicators from the studied items and enterprises.*

When ranking the indicators according to the above model, the ratings are on a scale from 1 (poor) to 10 (excellent) (Hadjiev, 2001, pp. 23-25; Hadzhiev, 2019; Hadzhiev, 2020a; Hadzhiev, 2020b). The same goes for the other CR models and methodologies. It is assumed that the indicators from a certain block and for the respective block in the model have the same weight. A generalized/average indicator of the three blocks is formed for the individual subjects.

It can turn out that the relevant aggregate indicator for a subject is low. However, this is not a reason to neglect its future entrepreneurial and innovation potential if its activity is closely related to a policy and strategy for seeking balanced benefits for business as well as nature and society, or for example, with the relation **"business – circular economy – CR"**.

That is why this instrument is more and more combined with the other two instruments:

- algorithm of process innovations in the relation "business – circular economy – CR";

- model of digital infrastructure for the interrelation of the economic subjects.

In the assessment of the entrepreneurial and innovation activity of the subjects, more and more interesting are policies and strategies concerning the degree of self-sufficiency of the process with waste and with already used products and materials and with optimal natural energy.

This is because through these policies and strategies are formed many interrelated goals, like:

- to reduce raw materials used from nature, like oil, natural gas, coal, ore, wood, etc.;

- to reduce the energy, needed to produce 1 unit of production;

- to reduce losses from waste disposal and from already used equipment and products;

- to reduce losses from storage and transportation;

- to increase the quality of products and services and the coefficient of efficiency of the subjects, machines and equipment that develop, implement and sell them;

- to improve education and culture concerning the relation "business – circular economy – CR".

Taking into account the mentioned trend of development of the policies and strategies of the subjects in the modern dynamic and increasingly electronic world, the scheme on Figure 4 presents a cycle for process innovations in the relation "business – circular economy – CR".

When, through process innovations, the values of operations Z1, Z2, Y1 and Y2 increase, then at sustainable consumption, the values of operation "X" unit of supply of primary natural resources will decrease. This means more benefits for nature, cleaner nature, saving of natural energy and higher quality of production. On the other hand, the reuse of already used raw materials and waste products makes them of better quality raw materials for production and continuously improves the quality of the final product. We should not ignore the fact that in this cycle, in the constant search for effective process innovations for operations Z1, Z2, Z3, Y1, Y2, Y3, the creativity of the subjects increases.

Figure 4

Cycle of process innovations in the relation "business – circular economy – CR"
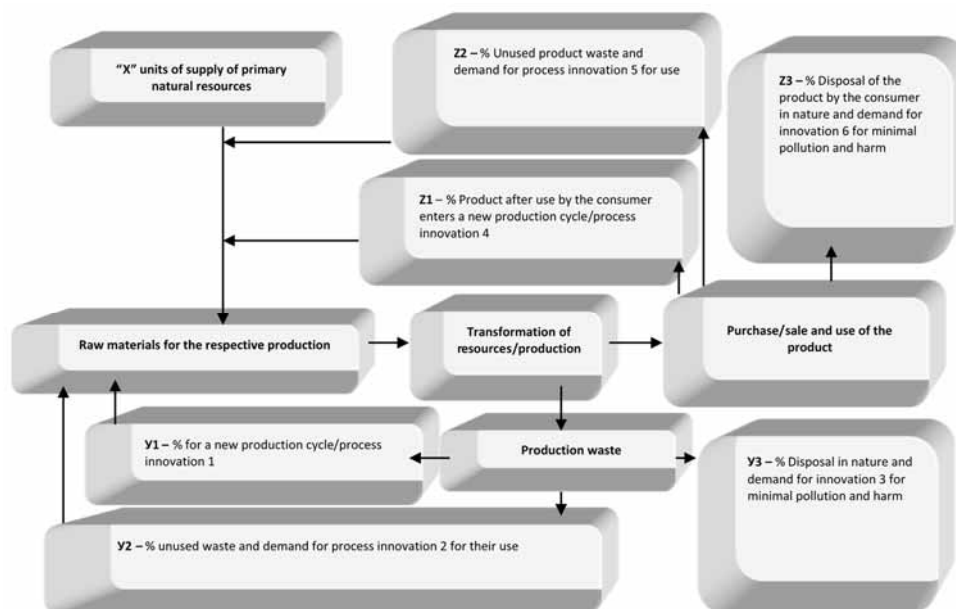
The study reveals that for the reengineering assessment of the entrepreneurial and innovation potential, it is useful to assess the conditions and efforts of the subjects in developing innovations in the six sectors of the mentioned cycle on Figure 4 and using digital infrastructure models for the interrelation of the economic subjects. The application of certain trading systems, models, algorithms in the respective business space requires appropriate infrastructure (digital and real).

A digital infrastructure **"Digital Entrepreneurial Business Forum 4.0"** app, which provides a digital existence of the subjects, is shown on Figure 5.

As pointed out by the President of the BCCI during a forum in 2019, the Chamber, in cooperation with Coface, Bulgaria (rating company) and Conet, Slovakia, issues a **certificate of excellence to SMEs (Excellent SME)**. This is an electronic business credit rating certificate, which aims to promote the successful companies, increase their competitiveness, the stable and secure business, the good business practices, and to increase market transparency. This is a new product on the Bulgarian market. BCCI is an exclusive representative offering the service on the territory of the Republic of Bulgaria. The benefits of EXCELLENT SME[3] for the traders generally are:

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[3] For information – https://www.bcci.bg/excellentsme.html.

- clear demonstration of good credit score;

- greater reliability of the company in the eyes of the customers and the business partners;

- verification of proper web address;

- smaller business risk;

- stronger trust in the trading partner;

- easier, faster and less risky business solutions.

Figure 5

Reengineering concept of digital infrastructure for the interrelation of subjects concerning the trade policy
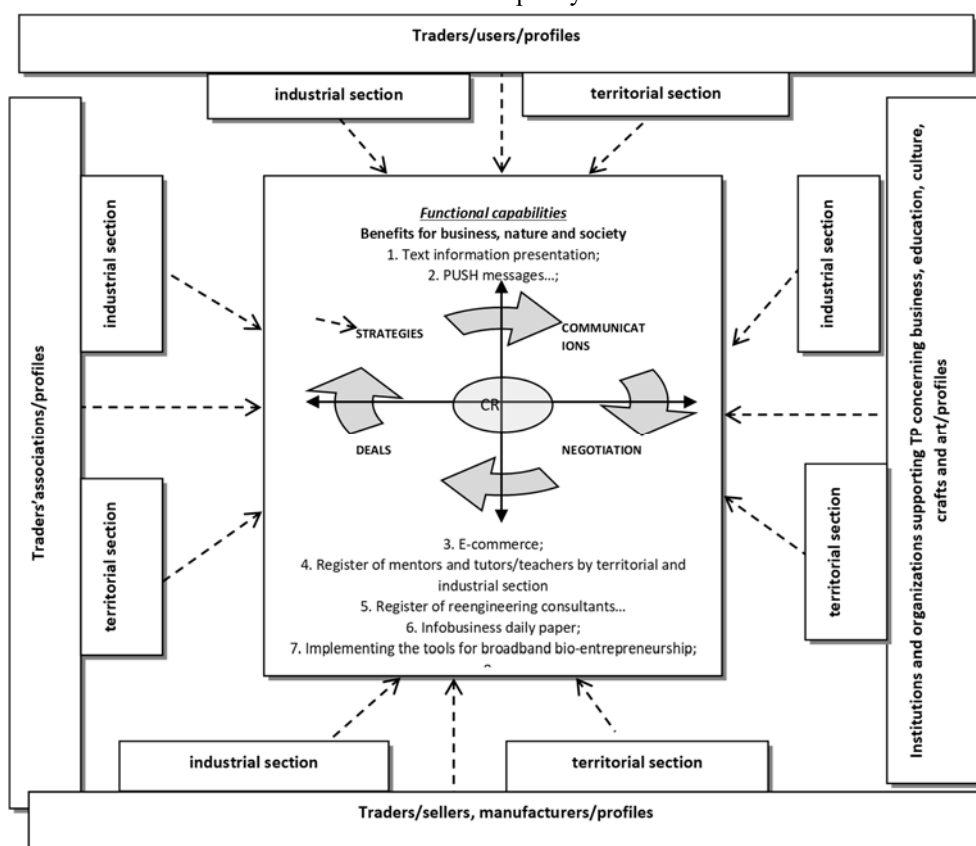
The mentioned digital infrastructure allows the subjects to gain a new digital existence and electronic instruments for orientation, communication, negotiations, deals, transactions, production, advertising and more. It gives the opportunity to combine the instruments of broadband entrepreneurship, applying together and separately the relevant algorithms and

thus satisfying the needs of traders and consumers in the territorial and industrial section. On the basis of this type of trade communication, the new trade policy (TP) is formed, which supports the reproduction of life in case of scarcity of means and resources in conditions of ambiguity and uncertainty. This type of TP becomes an engine for the development of human civilization and a means of forming the quality of life of the people in the new reality concerning the digitalization and the powerful development of the artificial intelligence and nanotechnology.

The paper reveals that the entrepreneurial and innovation potential of the enterprises in Bulgaria has the highest weight for their sustainable modern development. The assessment of this potential allows the subjects to make the right choice of policies and strategies for their development by focusing on process innovations in the relation "business – circular economy – CR". The assessment also provides an opportunity to understand that Industry 4.0 and Industry 5.0 are not a panacea, but are dependent on the industrial imagination, on the entrepreneurial and innovation potential of the subjects.

The fate of our economy lies in our entrepreneurial and innovation efforts for its prosperity related to solving the mentioned problems. Applying the necessary approaches even with other instruments has a high weight for achieving balanced benefits for the business, nature and society. It requires strong participation of the science in the practice, full work commitment and dedication to increase the entrepreneurial and innovation activity, especially for quality management in education, science and SMEs.

The technological world requires complex and innovative thinking, balanced benefits for the business, society and nature, as well as purity, organization and orderliness of each transformation.

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Hrabrin Bachev[1]

MODES OF GOVERNANCE FOR ECOSYSTEM SERVICES IN BULGARIAN FARMS[2]

Despite growing environmental issues and increasing public and private interests, scientific studies on the management of agroecosystem services are at the beginning stage. This article incorporates the interdisciplinary New Institutional Economics framework and identify and assess diverse private, market, collective and public modes of management of ecosystem services applied by the Bulgarian farms. The study has found out that farms of the country maintain or produce a great number of essential ecosystem services, among which provisioning food and feed and conservation of elements of the natural environment prevail. A great variety of private, market, collective and public modes of governance of farm activity related to agroecosystem services have been used. There is significant differentiation of employed managerial forms depending on the type of ecosystem services and specialisation of agricultural holdings. Management of agroecosystem services is associated with a considerable increase in the production and transaction costs of participating farms as well as big socio-economic and environmental effects for holdings and other parties. Factors that mostly stimulate the activity of Bulgarian producers for protection of agroecosystems and their services are participation in public support programs, access to farmers' advice, professional training, available information and innovation, received direct subsidies, personal conviction and satisfaction, positive experience of others, long-term and immediate benefits for the farm, and integration with suppliers, buyers and processors. A suggested holistic framework for analysing the system of management of agroecosystem services is to be extended and improved and widely and periodically applied in the future.
Keywords: ecosystem services; modes of management; Bulgarian farms
JEL: O13; Q12; Q13; Q15

Introduction

Ecosystem services are widely known as products and other benefits that humans receive from natural ecosystems (MEA, 2005). The agricultural ecosystems and their specific "agroecosystem" services are widespread in Bulgaria and internationally (EEA, 2015; EEA, 2020; FAO, 2016). Since the introduction of this concept in the last years of the 20th century,

(agro) ecosystem services have been intensively promoted, studied, mapped, evaluated, and managed (Adhikari et al., 2013; Allen et al., 2011; Boelee, 2013; De Groot et al., 2002; EEA, 2015; FAO, 2016; Fremier et al., 2013; INRA, 2017; Gao et al., 2018; Garbach et al., 2014; Gemmill-Herren, 2018; Habib et al., 2016; Kanianska, 2019; Lescourret et al., 2015; Laurans and Mermet, 2014; Marta-Pedroso et al., 2018; MEA, 2005; Munang et al., 2013; Nunes et al., 2014; Novikova et al., 2017; Petteri et al., 2013; Power, 2010; Scholes et al., 2013; Tsiafouli et al., 2017; Van Oudenhoven, 2020; Wang et al., 2013; Wood et al., 2015; Zhan, 2015).

Despite growing environmental issues and increasing public and private interests, the scientific studies in that new area are still a "work in progress". Research is commonly limited to a certain type of agroecosystem services (e.g. plant pollination, biodiversity conservation, etc.), a particular ecosystem (e.g. Zapadna Stara Planina, etc.), a single aspect of the management (agronomic, technological, etc.), a specific form of governance (a public support scheme, organic agriculture, etc.), a separate level of management (farming organisation, region, etc.), the specific type of costs and benefits (production, direct, etc.), etc. At the same time, the importance of effective management ("good" governance) for conservation and sustainable provision of ecosystem services in general and of a certain type has been broadly recognised by the academic community, policymakers, interest groups, professional and business organisations, and the public at large (Bachev, 2009, 2018; EEA, 2015; FAO, 2016; UN, 2005).

In Bulgaria, research on economic and other issues related to agroecosystem services are at the beginning stage and mostly at "conceptual and methodological" level (Kazakova, 2016; Nedkov, 2016; Nikolov, 2018; Todorova, 2017; Bachev 2011, 2012, 2020, 2021; Grigorova and Kazakova, 2018; EEA, 2020; Yordanov et al., 2017; Chipev et al., 2017). Besides, there very few studies on dominating modes of governance at the current stage of development and fundamental transformation of EU CAP (Bachev, 2010, 2012, 2014, 2016; Bachev et al., 2019, 2020; Todorova, 2017). This article fills the gap and presents the result of the first-in-kind "large-scale" study for identification of modes, efficiency and factors of management of ecosystem services applied by the Bulgarian farms.

1. Methods and Data

"Agrarian" ecosystems and "agrarian" ecosystem services are those associated with the agricultural "production" (Bachev, 2020). The hierarchical system of agroecosystems includes multiple levels (from individual farm plot/section, area, micro-region, macro-region, etc.) while their (ecosystem) services are classified into different categories (provisional, economic, recreational, aesthetic, cultural, educational, supporting, biodiversity conservation, water purification and retention, flood and fire protection, climate regulation, etc) (MEA).

The term "management of (agro)ecosystem services" refers to the *management of human actions and behaviour* related to preservation, improving and recovery of ecosystems and ecosystem services (Bachev, 2009). The *system of governance* of agroecosystem services always includes **the farm** as a key element and the *first level* of management of

agroecosystems and their services (Figure 1). Other agrarian and not agrarian agents (resource owners, inputs suppliers, wholesale buyers and processors, interests groups, policymakers, local and national authorities, residence and visitors of rural areas, final consumers, international organisations, etc.) also take part in the management of agroecosystem services at farms, regional, sectoral, national and international levels (Bachev, 2020).

<div align="right">Figure 1</div>

<div align="center">Levels and Modes of Governance of Agroecosystem Services</div>

<div align="center">*Source: author.*</div>
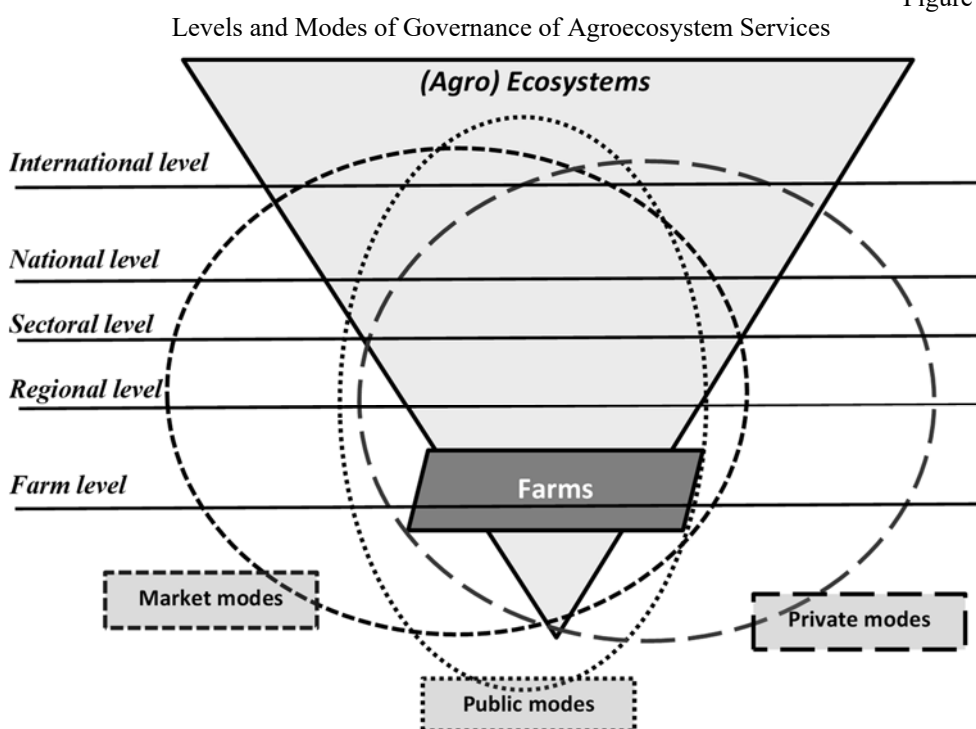
Farmers use diverse mechanisms and modes to manage their activity and relations with other agents – *internal* (direct production management, own conviction of farm manager/owner, building reputation, etc.), *market* (free-market price movements, competition, etc.), contract (special or interlinked contracts, etc.), *collective* (cooperation, joint initiatives, etc.), and *public* (public eco-contract, cross-compliance against EU subsidisation, etc.) (Bachev, 2012). Detailed presentation of the New Institutional Economics framework for studying and evaluating generic modes of governance and comparative advantages and disadvantages of individual forms used for ecosystem services management in Bulgarian agriculture is done in other publications (Bachev, 2009, 2011, 2012, 2020).

This study aims to identify modes, efficiency and factors of agroecosystem services management at the *farm level* in Bulgaria. In the country, there are no available (statistical

and other) data for the type of agroecosystem service provided by farms and the forms of management applied. Therefore, a literature review and widespread practices examination has been made to prepare the list of diverse types of agroecosystem services maintained or provided as well as major forms of management used by the Bulgarian farms. A survey with the managers of 324 "typical" farms[3] of different legal types, sizes, production specialisation, and ecological and geographical location was conducted in October 2020 to identify the structure of ecosystem services "produced" and governing modes employed. All major producers' organisations and the regional offices of the National Advisory Service were used to identify the typical farms in the principal agroecosystems of the country.

A structured questionnaire, prepared and tested after a number of in-depth interviews with leading experts and managers, was used in the survey with the managers of selected farms. The questionnaire also provides an option (open-ended questions) to respondents to add specific services provided and managerial forms practised in their particular holdings. The aim was to get insights on the agroecosystem services and modes of governance in the selected (presumably) typical farms in respected agroecosystems. This study (like most "agrarian" and governance studies) has neither ambition nor possibility to give a full "representative" picture of the status quo in the country. The goal rather is to start research in this new important area and test the suggested interdisciplinary approach.

The classification of agricultural holdings has been done according to official classification in the country and EU. The structure of surveyed agricultural holdings approximately corresponds to the real structure of farms in Bulgaria. The subsectors, regional, national, etc., summaries are arithmetic averages of data provided by the individual farms belonging to respective agro-systems.

2. Type and Amount of Farms' Ecosystem Services

The share of farms involved in activities related to the provision of agroecosystem service of a certain kind gives a good idea of the volume of "produced" service of that type.

The majority of surveyed farms participate in the "Production of products (fruits, vegetables, flowers, etc.) for direct human consumption" (59%), which is one of the main "services" of agroecosystems in the country (Figure 2). A significant part of the farms also "Produce raw materials (fruits, milk, etc.) for the food industry" (15%). Other "production" services in which a smaller part of the farms participate are "Production of animal feed" (9%), "Own processing of agricultural products" (6%), "Production of seeds, saplings, animals, etc. for farms" (4%), and "Production of raw materials for cosmetic, textile, energy, etc. industry" (3%).

Other "production" services of agroecosystems, in which a relatively small part of agricultural producers participate, are "Provision of services to other farms and agricultural organisations" (2%), "Provision of services to end-users (riding, fruit picking, etc.)" (2%),

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[3] The author is grateful to all managers of the surveyed farms for the information provided, and to the NAAS and the cooperating producers' organizations for the assistance.

"Provision of tourist and restaurant services" (1%) and "Production of bio, wind, solar, etc. energy" (1%).

Other important services of the agroecosystems, in which "supply" a large part of the agricultural holdings participate, are "Hiring workers" (11%) and "Providing free access on the farm to outsiders" (10%).

Relatively many of the farms are also involved in the protection and preservation of technological, biological, cultural and other heritage – "Preservation of traditional crops and plant varieties" (6%), "Preservation of traditional species and breeds of animals" (7%), "Preservation of traditional methods, technologies and crafts" (6%), "Preservation of traditional products" (6%), "Preservation of traditional services" (5%), "Preservation of traditions and customs" (4%) and "Preservation of historical heritage" (1%).

The activity of a large part of the agricultural holdings is aimed at preserving, restoring and improving the elements of the natural environment – "Disease control (measures)" (25%), "Pest control (measures)" (20%), "Protection of natural biodiversity" (19%), "Protection and improvement of soil fertility" (17%), "Protection from soil erosion" (14%), "Protection and improvement of soil purity" (12%), "Protection of surface water" (12%)," Protection of groundwater purity" (10%)," Fire protection (measures)" (9%), and "Protection of plant and/or animal gene pool" (8%).

A relatively smaller part of the farms are involved in "(Measures for) water conservation and saving" (5%), "(Measures for) regulation of the correct outflow of water" (4%), "Preservation of air quality" (4%), "Preservation of traditional scenery and landscape" (4%), "Improvement (aesthetics, aroma, land use, etc.) of scenery and landscape "(3%), "(Measures for) regulation and improvement of the microclimate" (3%), "Flood protection (measures)" (2%), and "Greenhouse gas emission reduction (measures)" (2%), and "(Measures) for storm protection" (2%).

Essential ecosystem services of many farms are the recovery and recycling of "waste" from various activities in the sector and other industries – "Use of manure on the farm" (14%), and to a lesser extent "Reuse and recycling of waste, composting, etc." (3%) and "Use of sludge from water treatment on-farm" (1%).

In educational, scientific and innovative ecosystem services participate a smaller part of the agricultural producers – "Training and advice of other farmers" (4%), "Training of students, consumers, etc." (2%), "Demonstration of production, technologies, innovations, etc." (2%) and "Conducting a scientific experiment "(2%).

Agroecosystems also contribute to the "Protection and improvement of non-agricultural (forest, lake, urban, etc.) ecosystems" with 4% of farms in the country engaged in such efforts.

The extent of participation of supplying farms in the preservation or production of agroecosystem services is not equal (Figure 2). For most agroecosystem services, the holdings involved in the activities do so "To a large extent". Therefore, "permanent" investments in agri-ecosystem services and "specialisation" in the provision of agroecosystem services of a certain type by participating farms can be considered.

Figure 2

Share of farms participating and providing to a big extent diverse ecosystem services in Bulgaria (%)
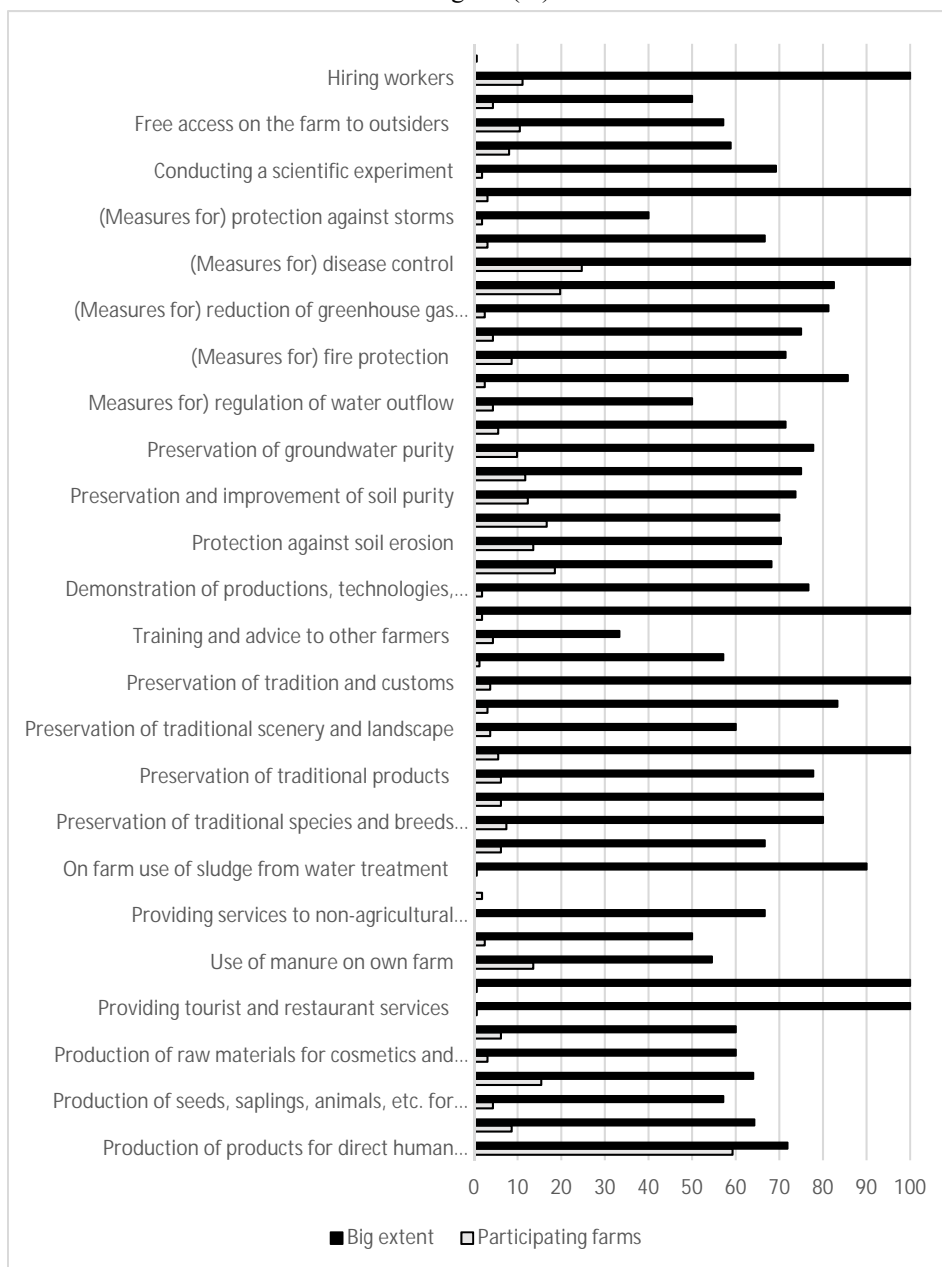
Source: Survey of agricultural producers, 2020.

In some agroecosystem services, the share of farms involved to a large and small extent is equal – e.g. in the use of manure on the farm, the provision of services to other farms and agricultural organisations, (flood protection) measures, and the hiring of workers. Therefore, a significant proportion of farms are either in the process of initially "entering" (testing, studying, adapting, etc.) in the related agroecosystem services, or participate in such a supply as ancillary or related to the main activity.

With regard to three main types of agro-subsistence services, most of the farms involved in supply do so to a small extent – on-farm using sludge from water treatment, training of students, consumers, etc., and use and recycling of waste, composting, etc. This is a sign of either the initial entry into or exit from this activity, or the inefficiency of its further expansion (intensification) by practising farms.

The unequal participation of farmers in the provision of agroecosystem services of different types and unlike degrees of involvement in such activities shows the need to take measures to improve, diversify and intensify this activity through training, information, exchange of experience, public incentives, etc.

Our study has found out that there are significant differences and deviations from the average level in the participation of agricultural holdings in the preservation and provision of agroecosystem services in the main geographical and agricultural regions, and major principle and specific (agro)ecosystems, and different subsector of agricultural production of the country (Bachev, 2021).

3. Dominating Mechanisms of Management of Farms' Ecosystem Services

The survey found that a large proportion of surveyed Bulgarian farms use some specific mechanisms in making decisions about managing their activities related to agroecosystem services (Figure 3). However, a different proportion of farms apply specific mechanisms to manage the various aspects of the activity related to the provision of agroecosystem services. In the Production of products for direct consumption, all farms use some "special" forms.[4] A relatively large part of the farms also uses specific mechanisms in the management of Soil Protection (31%), Water Protection (34%), Biodiversity Protection (33%) and Landscape and Scenery Protection (20%). Fewer farms use specific forms to manage the supply of the other main types of agroecosystem services.

The specific forms and mechanisms applied for the effective governance of different types of agroecosystem services are quite different. For most farms, independent internal (*Independently by the farm*) management is essential for the supply of all major agroecosystem services (Figure 4). This form is practiced by the vast majority of farms, in agroecosystem services with the character of "local or public goods" (inability to sell and protect rights, high specificity and uncertainty, low frequency of exchange with a particular user, etc.) - Soil protection (90%), Water protection (80%), Biodiversity protection (81%),

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[4] The modes and efficiency of governance of this type of activity of Bulgarian farms have been widely studied and presented in academic literature (Bachev, 2010, 2018).

Landscape and scenery protection (82%), Climate change control (78%), Preservation of breeds, varieties, products, etc. (87%) and Use of manure, sludge, etc. (90%). This form is least used in making management decisions concerning the production of raw materials for industry (42%), where there is a high dependency (specificity of the product, capacity, delivery time, location, etc.) of the particular buyer(s) and market(s) and there is a need to use more effective forms of coordination and governance.

Figure 3

Share of farms using specific mechanisms for decision-making of activity associated with agroecosystem services in Bulgaria (%)
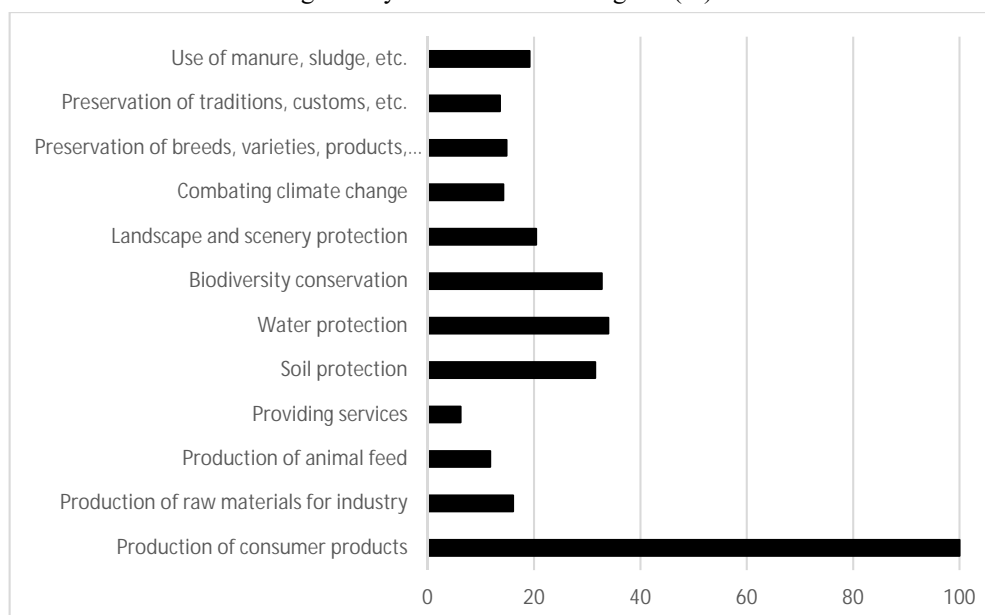
Source: Survey of agricultural producers, 2020.

Collective decision-making with other farmers and agents is a form that is applied by a significant part of the farms in relation to the Preservation of traditions, customs, etc. (32%) and a large part of them in the Production of raw materials for industry (15%), Water protection (14%), Biodiversity protection (13%), Landscape and Scenery protection (12%) and Combating climate change (13%). The collective form for most of these services (with the character of "local or public goods") is determined by the need for coordinated "collective action" (high dependence of assets and actions) to achieve a certain positive result. The collective organisation in the production of raw materials for the industry is most often required by the need for a certain minimum volume and standardisation for efficient market or vertically integrated trade (achieving efficiency in wholesale trade, compliance with the requirements of processors for quality, volume and frequency of supplies, etc.) or to oppose an existing (quasi)monopoly, etc.

Market mechanism and market prices and demand are exclusively and widely applied only to traditional (commercial) farming products and services – mostly in the Production of raw materials for industry (35%), Production of products for direct consumption (17%), and in less extent in Production of animal feed (11%) and Provision of services (10%). As mass and standard products are traded, the market works well and there is no need to use a more expensive special form to govern the relationship between supplier and buyer.

A special private form – Contract with a private agent/s is used when it is necessary to regulate in detail the relations of the parties due to high unilateral or bilateral dependency of assets, high frequency of transactions between the same agents, and uncertainty and risk of market trading (specification of the product, delivery time, a form of payment, interlinked transactions, a guarantee of trade between the parties, etc.). The contractual form is applied by every tenth farm in the provision of services, and a large part of the farms in the production of raw materials for industry (8%), production of animal feed (5%), and the use of manure, sludge, etc. (6%).

Public intervention (support) is required when private and market forms cannot fully govern the supply of certain agroecosystem services due to public nature, low appropriability, high specificity and uncertainty, etc. Participation in a public program is a form that is applied most by farms in the Fight against climate change (9%), Landscape and scenery protection (6%), and Preservation of breeds, varieties, products, etc. (4%).

Figure 4

Mechanisms used in decision-making on farm activities related to different types of agroecosystem services in Bulgaria
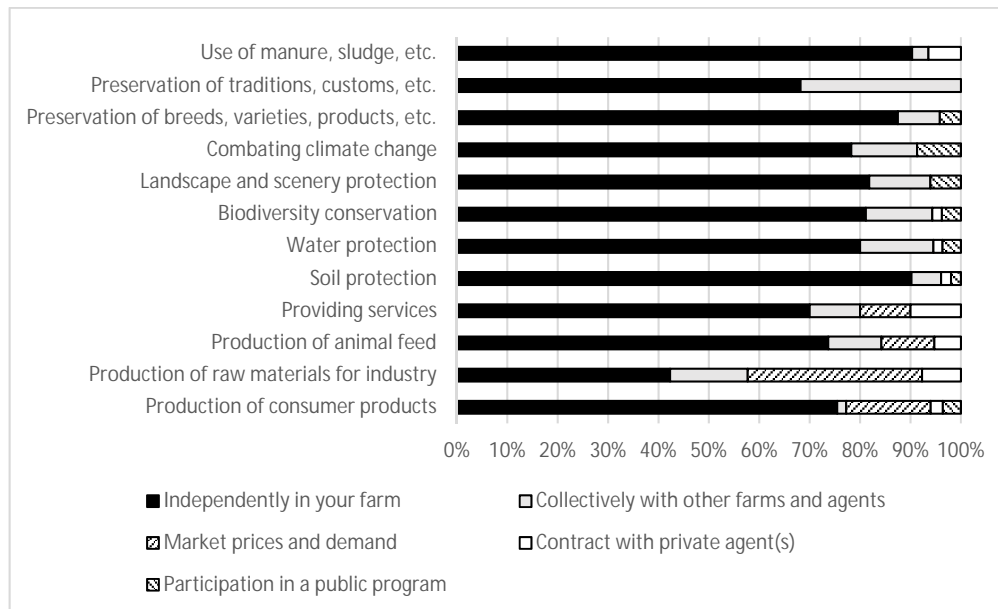
Source: Survey of agricultural producers, 2020.

Depending on the specificity of production (and the production agroecosystem), farms with *different specialisations* use to unlike extent specific mechanisms for deciding on the activity related to agroecosystem services of different types (Figure 5). The largest share of farms specialised in Field crops (29%) use specific mechanisms in the production of raw materials for industry. The most widespread special mechanisms for the production of animal feed are practiced at Mixed crop-livestock holdings (41%). Every third producer in Pigs, Poultry and Rabbits applies similar mechanisms for (standard) services provision. A significant part of the specialised in Permanent crops (44%) and Mix crops (36%) need special management mechanisms for soil Protection. In water protection, most of the holdings in Permanent crops (40.35%), Mix crop-livestock (37.04%) and Mix crops (36.36%) adapt special forms.

Figure 5

Share of farms with different specialisation, using specific mechanisms in decision-making on the activity related to agroecosystem services in Bulgaria (%)

Source: Survey of agricultural producers, 2020.

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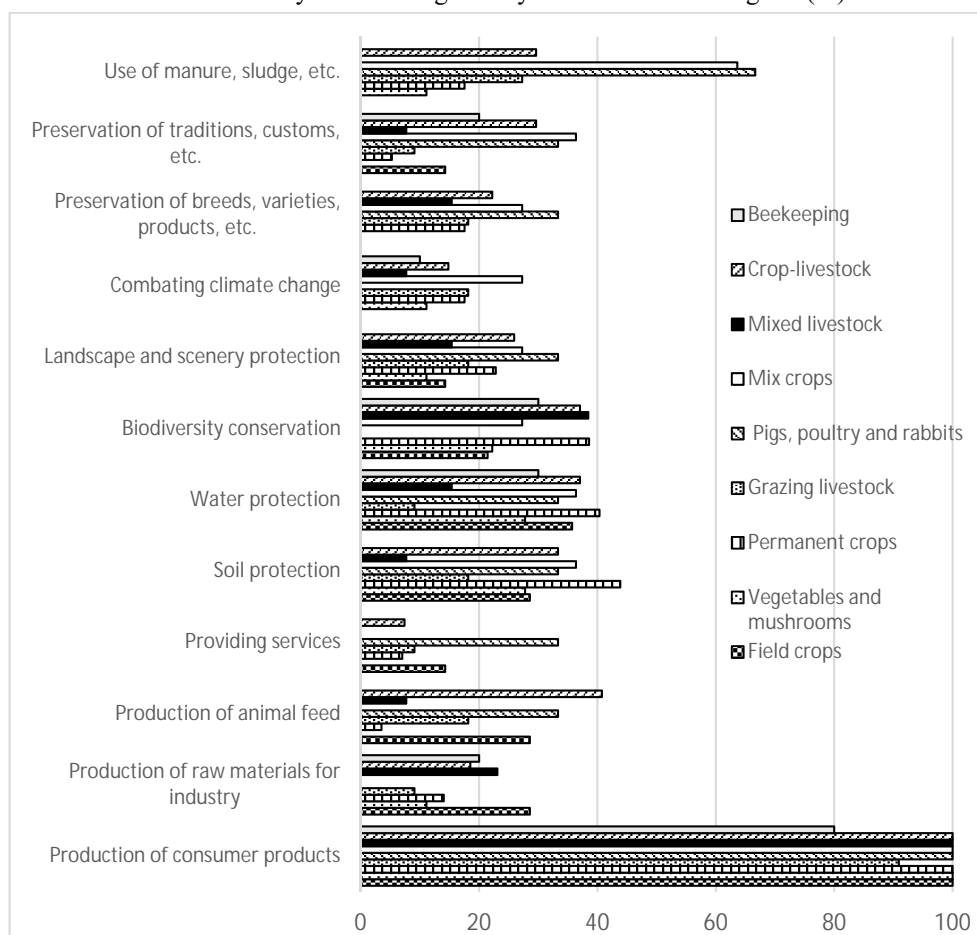
Farms in Permanent crops (39%), Mixed Livestock (38%), and Mixed crop-livestock (37%) use the most specific mechanisms for biodiversity conservation. One-third of the specialised holdings in Pigs, Poultry and Rabbits apply special forms for landscape and scenery protection. The largest part of the farms with Mix crops (27%) and Grazing livestock (18%) apply special management mechanisms in the fight against climate change. For the preservation of breeds, varieties, products, etc. and for the preservation of traditions, customs, etc., every third farm with pigs, poultry and rabbits needs such mechanisms. The majority of those specialised in Pigs, Poultry and Rabbits (67%) and Mixed crops (64%) apply special mechanisms in making management decisions for the use of manure, sludge, etc.

At the same time, however, there is a significant variation in the type of specific mechanisms used to make management decisions by farms with different specialisations. For example, for the Conservation of Natural Biodiversity, every third farm specialising in field crops applies Participation in a public program. When managing the supply of the same ecosystem service, two-thirds of the farms with bee colonies and one-third of those in Mixed crops do it Collectively with other farms and agents. Similarly, when managing the fight against climate change, half of the Mixed Crop-Livestock holdings do so Collectively with other farmers and agents, while one-fifth of the farms specialising in Permanent crops use Participation in a public program.

For some agroecosystem services with a high (capacity, location, product, etc.) specificity to a particular buyer(s) no (free)market forms (Soils protection, Waters protection, Protection of biodiversity, Preservation of landscape and scenery, Combating climate change, Preservation of breeds, varieties, products, etc.) or public forms (Production of raw materials for industry, Production of animal feed, and Services supply), or both market and trilateral with public involvment forms (Preservation of traditions, customs, etc., and Use of manure, sludge, etc.) develop. For the later mostly or exclusively private (internal, contract, collective, etc.) modes are used by all types of farms to govern their activity and relations associated with ecosystem services.

Our study has found no significant differences found in specific modes of management of specific agroecosystem services applied by farms of different juridical types (Sole Trader, Cooperative, etc.), in different ecosystems (mountainous, plain, etc.) and regions of the country. Thus differentiation of the managerial modes mostly depends on the specificity of the agroecosystem services and the subsector of agricultural production.

4. Private, Collective and Market Modes

Most of the surveyed farms apply special private and market forms to govern the supply of agroecosystem services. Over 17% of all farms are certified for organic production, and a small part combines mixed organic and traditional production (3%) (Figure 6). Formal certification is associated with additional costs for farmers (conversion period, certification, current control, etc.) and consumers (premium to market price), but also brings significant benefits for both parties. Farmers have a formal guarantee for the authenticity of their products, receive a price bonus and public subsidies, develop a reputation and market position for special and high-quality products. Consumers receive a guarantee of authenticity and low-

cost acquisition of products related to agri-ecosystem services. The process is controlled by an independent (third) party, which increases trust and reduces transaction costs. This threelateral market-oriented form will become even more important in the future given the growing consumer demand in the country and on international markets, and the further greening of the CAP in the next programming period and increasing incentives to expand organic production in the EU.

Most of the agricultural holdings have a built Reputation for ecologically clean products (15%) or With naturally ecologically clean production (19%). Informal private and collective forms such as building a "good reputation" for special quality, products, origins, etc., of certain farms, ecosystems and entire regions are widespread in the country's agricultural practice. In the future, they will continue to effectively manage the relationship between producers and consumers for the supply of agri-ecosystem services. Transaction costs are low, as long-term "personal" relationships ("clientalization", high frequency) are developed for trading certain products, primarily in local and regional markets, and opportunism is punished by the cessation of trade and "bad" reputation.

Due to high costs (registrations, control, etc.) and low returns, very few farms apply other formal private or collective forms of agri-ecosystem services management. A little over 5% are members of a collective organisation (6%), a little over 1% are with own trademark, protected origin, etc. (1%), less than 1% participate in a Collective Trademark, Protected Origin, etc. (1%) or in a Collective Initiative (1%).

However, given the significant transactional benefits (sales to large retail chains, exports, premiums, etc.), the number of farms investing in such special private and market forms is gradually increasing. In the process of certification are 3% of all farms are, With a plan for bio-certification (2%) and With a plan for eco-brand, protected origin, etc. (2%).

Figure 6

Share of farms applying diverse private, collective, and market forms for the supply of agroecosystem services in Bulgaria (%)
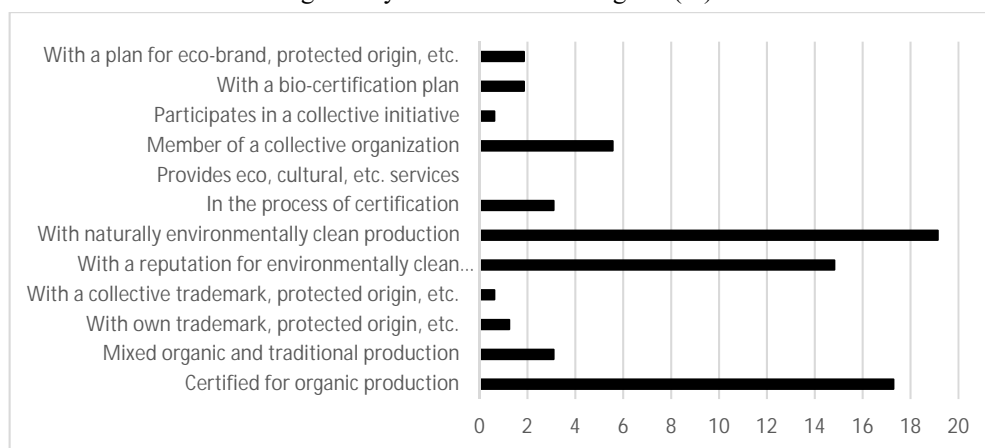
Source: Survey of agricultural producers, 2020.

Nearly three-quarters of the surveyed farms reported that they participate in some initiative for the protection of ecosystems and ecosystem services. The majority of farms Implement own (private) initiative in this regard (57%) (Figure 7). Quite a part of the holdings Implements informal Initiatives of other farms (13%).

Almost every tenth (10%) reports participating in a State initiative related to the protection of ecosystems and ecosystem services. This hybrid (public-private, trilateral) form is also usually associated with receiving certain subsidies or other support in return for certain commitments for improved environmental management. Just over 2% of farms Have a contract with the state to implement such an initiative.

A small share of farms participates in other private and collective formal environmental management initiatives - Formal initiatives of other farms (2%), Initiative of a professional organisation (4.1%), Initiative of a non-governmental organisation (3%), Initiative of a cooperative of which they are members (2%), and International initiative (1%).

Figure 7

Share of farms participating in an initiative for the protection of ecosystems and ecosystem services in Bulgaria (%)
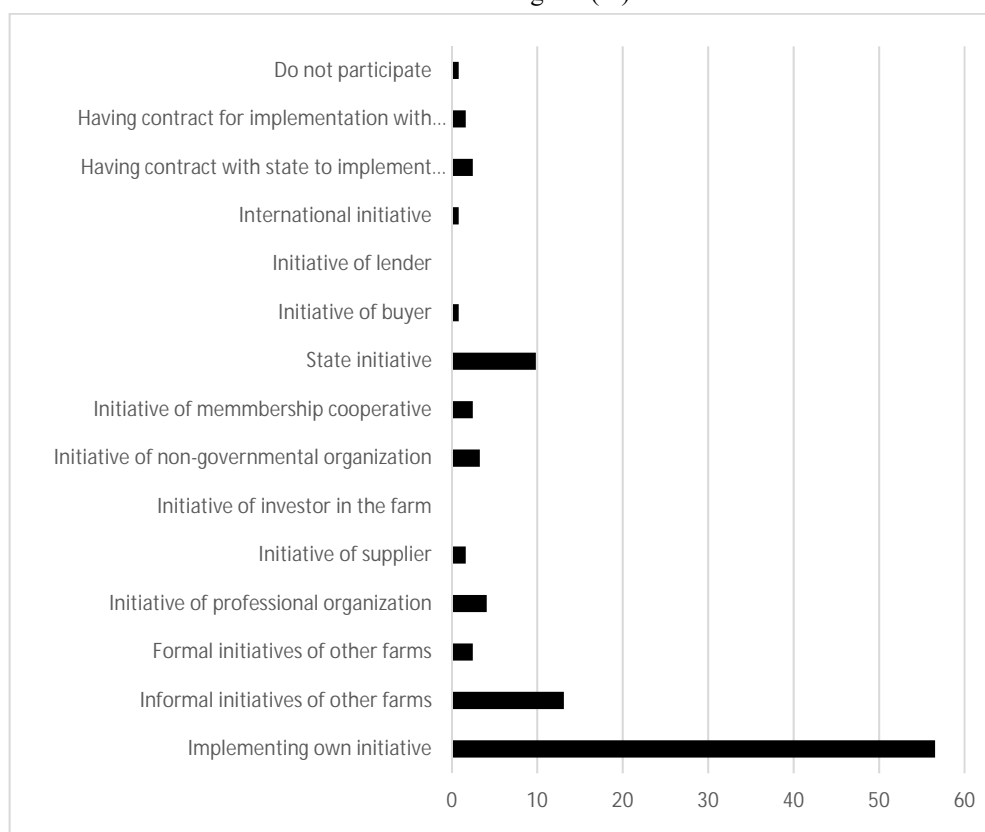
Source: Survey of agricultural producers, 2020.

For a small part of the farms, the initiative is of (induced by) Supplier of the farm (2%) or by Buyer (1%), and around 2 % of the farms even Have a contract with a private organisation for implementation of eco-initiative.

All this shows that the effective forms that farms and other stakeholders use to govern their relationships and actions related to environmental protection and agri-ecosystem services are diversifying.
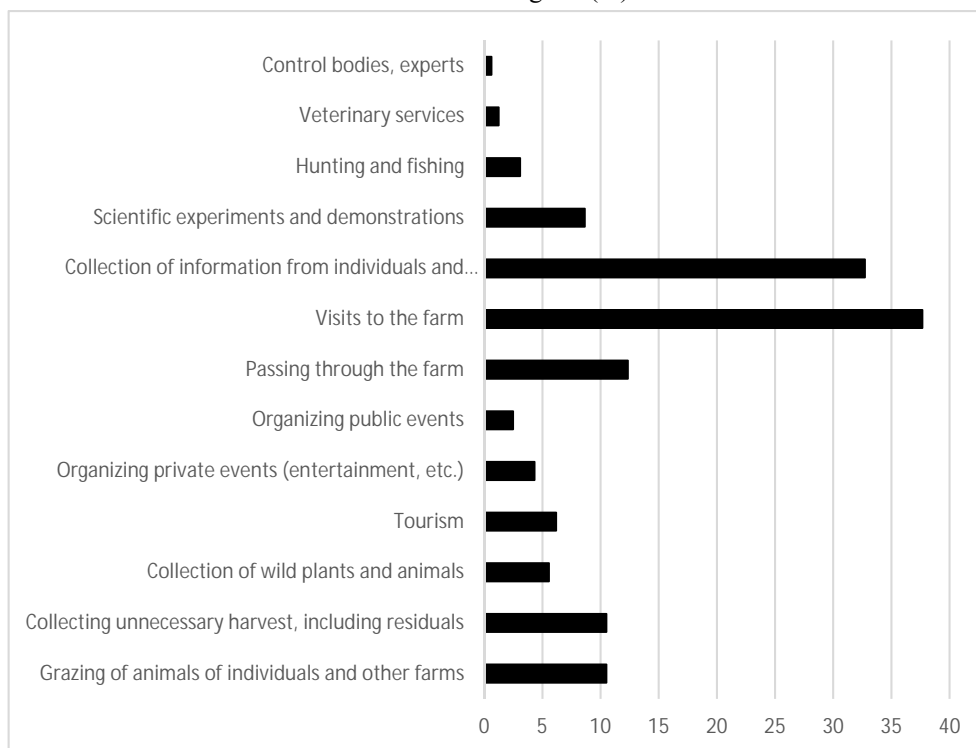
5. Providing Outside Access to the Territory of the Farm

Providing external access to the territory of agricultural holdings is a basic form of supply and/or consumption of ecosystem services in agriculture.

The share of farms that provide access to outsiders on their territory varies depending on the agroecosystem services used (Figure 8). A significant part of the farms allows External visits to the farm (38%) and Collection of information from individuals and institutions (33%). Relatively smaller is the number of farms that allow Passage through the farm (12%). Every tenth farm allows Grazing of animals of other individuals and farms (10%) and Collection of unnecessary for the farm harvest, including residues (10%). Quite a few of the Bulgarian farms also provide their territory for Scientific experiments and demonstrations (9%), Tourism (6%) and Collection of wild plants and animals (5%). To the least extent, the territory of the farms is available for the Organization of private events (entertainment, etc.) (4%), Hunting and fishing (3%) and Organization of public events (2%). An insignificant part of the holdings also indicated Other reasons, such as Veterinary services (1%) and Control bodies and experts (1%).

For the different types of external access on the territory of the farms, specific forms for governing the relationship of agents are practiced (Figure 9). Free and unrestricted access is the dominant form of providing access to the territory of the farm for grazing animals of individuals and other farms (47%), Collection of wild plants and animals (67%), Tourism (70%), Organising private events (43%), Organization of public events (50%), Passage through the farm (65%), Veterinary services (50%) and Control bodies and experts (100%). This form is also practiced by a large number of farms for the Collection of unnecessary harvest, residues (35%), Collection of information from individuals and institutions (30%), Scientific experiments and demonstrations (29%), Visits to the farm (21%), and Hunting and fishing (40%). All these agroecosystem services are treated as public goods and their use and consumption are "managed" by providing free and unrestricted access by farm owners. Most of these services are difficult to regulate or exchange as private goods due to high uncertainty and enforcement costs.

Figure 8

Share of farms that provide external access to their territory for using of various ecosystem services in Bulgaria (%)

Source: Survey of agricultural producers, 2020.

In many cases, the main form for providing access to the territory for the farm is Free but regulated – for Collection of unnecessary crops, residues (47%), Visits to the farm (72%), Collection of information from individuals and institutions (64%), Scientific experiments and demonstrations (64%) and Hunting and fishing (60%). This form is widely used by a large number of farms in allowing access to the territory for Grazing animals of individuals and other farms (41%), Collection of wild plants and animals (22%), Organization of private events (29%), Organising public events (25%) and Passing through the farm (25%). The use and consumption of this type of agroecosystem services are managed through a private form – regulation, and they are provided free of charge by farm owners. The form of free provision is determined either by the additional benefits received for the farmers (in case of grazing animals of individuals and other farms, collection of unnecessary crops, residues, collection of wild plants and animals, organisation of private and public events, etc.), or from the high costs of enforcement – constant control, penalties, disputing through a third party, etc. (in Passing through the territory of the farm, Hunting and fishing, etc.). Here, regulation is

needed to plan and coordinate external access and/or limit consumption to maintain a sustainable supply of agroecosystem services.

A portion of farms uses a market form of exchange against payment of a price to provide external access to the territory of the farms. This form of sale of services is practiced in grazing animals on individuals and other farms (12%), collection of unnecessary crops, residues (18%), collection of wild plants and animals (11%), tourism (20%), organising private events (29%), organising public events (25%), passing through the farm (10%), visits to the farm (7%), gathering information from individuals and institutions (6%), scientific experiments and demonstrations (7%) and veterinary Services (50%). The market form is preferred because it governs well the supply of "limited" agroecosystem services and relationships of counterparts. Market trading is beneficial for both parties, who mutually profit from the transaction, as the terms of exchange are easy for no or low-cost negotiation, control and sanctioning. Here, the classic contract of "spotlike" exchange under standard conditions applies, and payment is made on the spot or in advance to avoid any possible opportunism.

Figure 9

Type of external access to farm's territory for the use of different ecosystem services in Bulgaria

Source: Survey of agricultural producers, 2020.

Agricultural holdings with different specialisations provide unequal external access on the territory to farms for using different agroecosystem services (Figure 10). To the greatest

extent outside access to the territory of the farm for grazing animals of individuals and other farms is provided by holdings specialised in Grazing livestock (36%) and Mixed crop-livestock operations (22%).

Figure 10

Share of farms with a different specialisation that provides external access to their territory for use of agroecosystem services in Bulgaria (%)
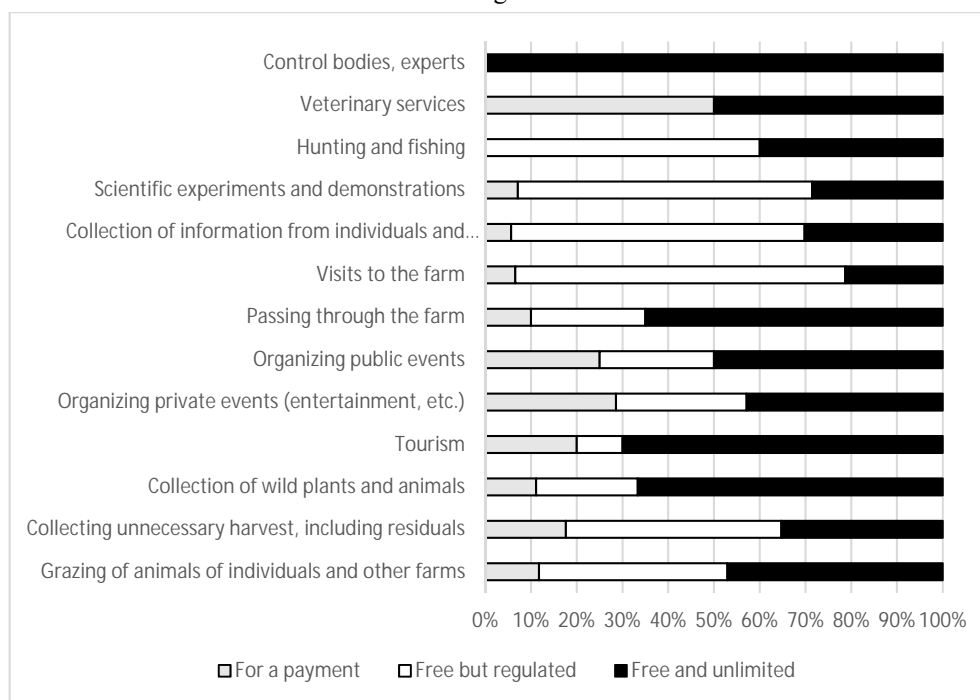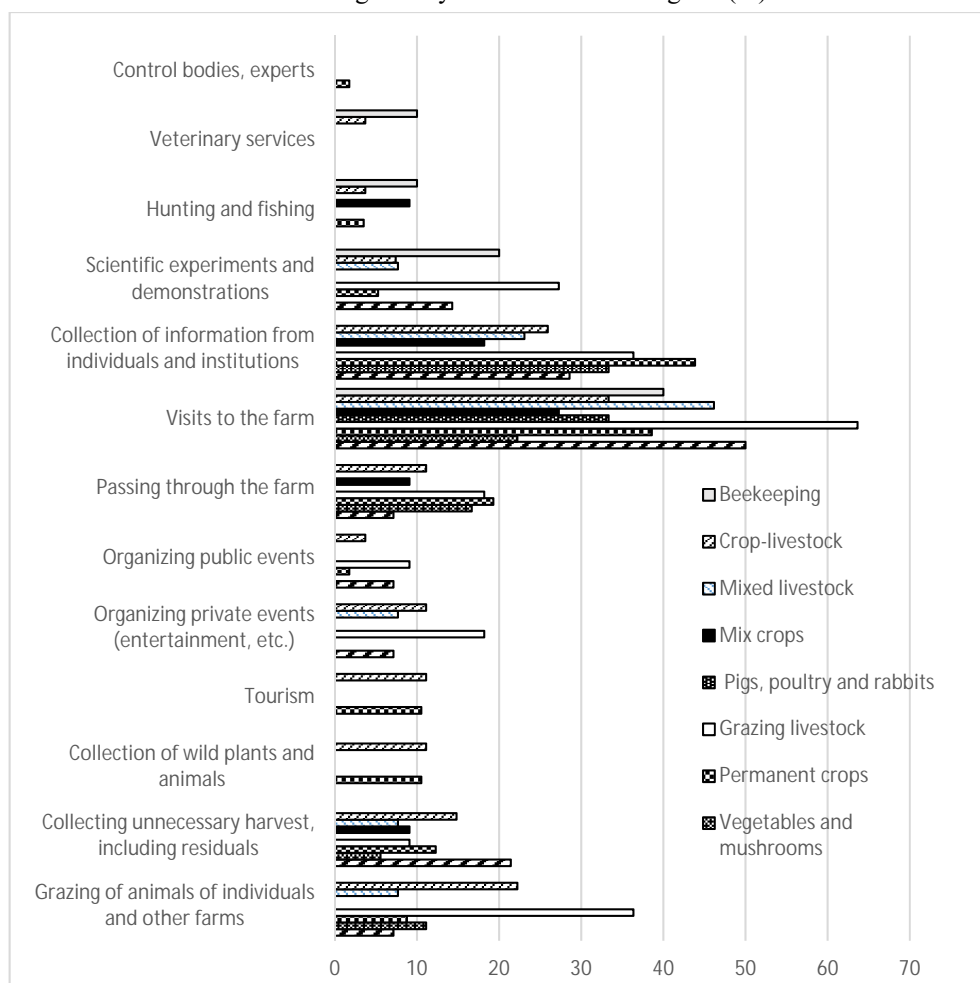

Source: Survey of agricultural producers, 2020.

For Harvesting of unnecessary output, including Residues, most farms providing external access to their territory are among specialised in field crops (21%) and crop-livestock (15%). The largest share of mix crop-livestock farms (11%) also allows the collection of wild plants and animals and tourism in their territory.

Specialized in grazing livestock to the greatest extent provide external access on the territory of their farms for Organising private events (entertainment, etc.) (18%) and Organising public events (9%).

Most farms that allow passage through the farm territory are among those specialised in permanent crops (19%) and grazing animals (18%). Most visits to the farm are allowed by farms specialising in grazing animals (64%) and field crops (50%).

The largest share of farms that allow the collection of information from individuals and institutions are among those specialising in permanent crops (44%) and grazing animals (36%), and for scientific experiments and demonstrations among those specialising in grazing animals (27%) and Bee families (20%). Every tenth farm with bee families also allows the use of its territory for hunting and fishing.

Therefore, in addition to the product specialisation, there is a certain specialisation in the provision of agroecosystem services related to external access on the territory of the farms.

Farms with different specialisations use unequally different forms for ensuring open access to the territory of farms for the use of agroecosystem services. The preferred most efficient mode is (pre)determined by the specifics of the production and the use of territory and/or the preferences of the owners/managers of the individual farms and the external users of the related agroecosystem services. For example, for farms specialised in field crops, vegetables and mushrooms, and mixed livestock, Free but regulated access is the only form used for providing external access to the territory for grazing animals to individuals and other farms. At the same time, most of the farms specialising in permanent crops practice Free and Unrestricted Access, while the remaining one-fifth apply for Paid access.

Similarly, relations with clients associated with Harvesting unnecessary output, incl. residues on the territory of farms specialised in Vegetables and Mushrooms, Grazing livestock and Mixed crops are managed entirely on a contractual basis for payment. At the same time, for all other groups of farms, the used form is either Free but regulated or Free and unrestricted access.

6. Efficiency and Importance of Farms' Ecosystem Services Provision

According to the majority of managers of the surveyed farms, their activity for the protection of ecosystems and their services is associated with an Increase in the total production costs of the farm, Increase of the specialised costs for nature protection, Increase of long-term investments, Increase of management costs and efforts, Growth of the costs of participation in state aid programs, Increase in the costs of studying the regulations and standards, and Increase in the costs of registrations, tests, certification, etc. (Figure 11). Moreover, for the majority of farms this activity leads to a high increase in the total production costs of the farm (50%), the specialised costs for nature protection (41%), long-term investments (51%), the costs for participation in state aid programs (40%), and the costs of registrations, tests, certification, etc. (51%). At the same time, for only a small part of all farms, environmentally-friendly activity is associated with a reduction in the various types of production and transaction costs.

Costs and efficiency of the activity of farms for protection of ecosystems and their services in Bulgaria (%)
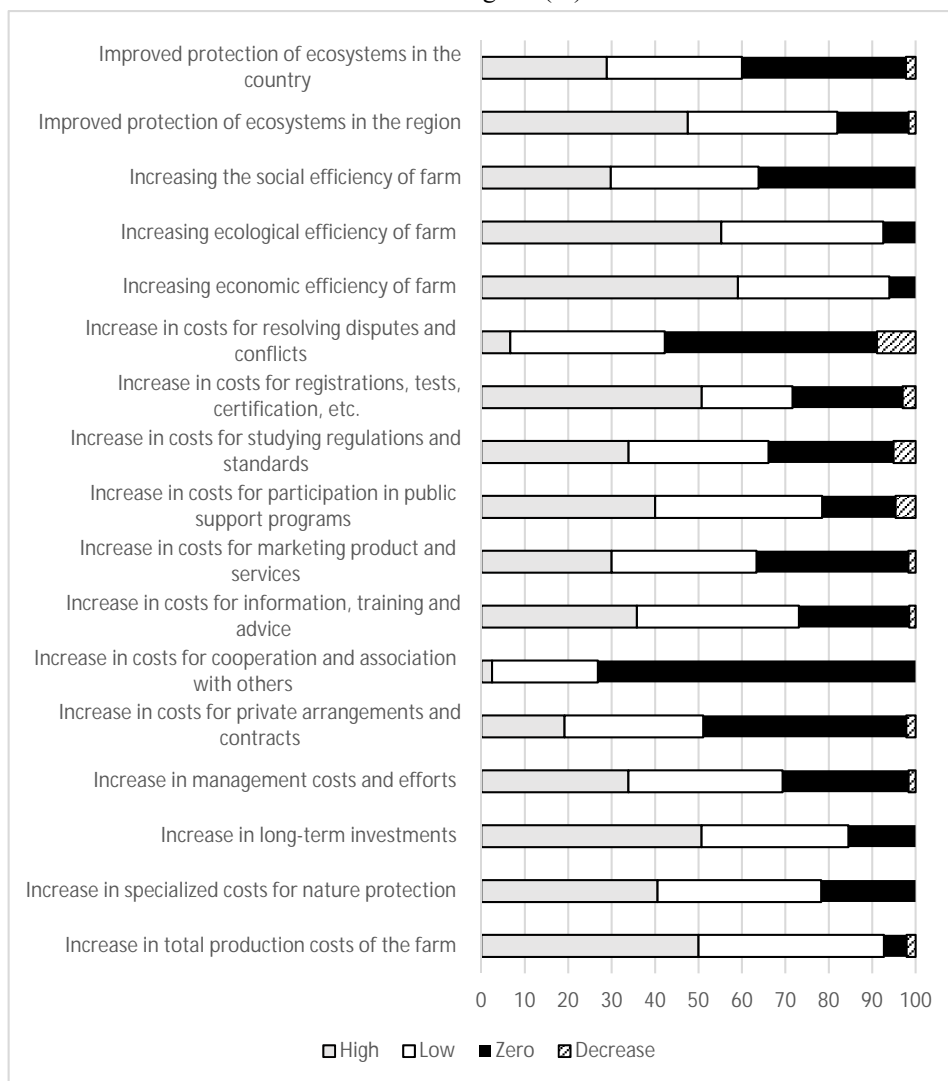
Source: Survey of agricultural producers, 2020.

At the same time, however, the vast majority of farms report that their activities for the protection of ecosystems and their services are also associated with an Increasing the economic efficiency of the farm, Increasing the ecological efficiency of the farm, Increasing the social efficiency of the farm, Improved protection of ecosystems in the region, and Improved protection of ecosystems in the country. At the same time, the majority of farms

estimate that their environmentally friendly activity leads to a high increase in the economic efficiency of the farm (59%), the ecological efficiency of the farm (55%) and the protection of ecosystems in the region (48%).

None or very few of the surveyed farms indicate that their activities for the protection of ecosystems and their services are related to reducing the economic efficiency, environmental and social efficiency of the farm, and the protection of ecosystems in the region and the country. However, a significant share of farm managers believes that their efforts and costs to protect ecosystems and ecosystem services do not lead to changes in the social efficiency of the farm (36%) and improved protection of ecosystems in the country (38%).

There is significant differentiation in the level of costs and efficiency of farm activities related to the protection of ecosystems and ecosystem services (Figure 12). *A high* increase in the total production costs of the farm was reported by half of the farms specialising in field crops and mixed crop production, three-quarters of those in grazing animals, and all of those in bee colonies. The share of farms with a high increase in these costs is the smallest among holdings specialised in vegetables and mushrooms (every third) and none in pigs, poultry and rabbits.

The largest share of farms with a high increase in specialised costs for nature protection are among those specialised in field crops, mixed crop production and crop and mix crop-livestock production (50% each) and bee families (100%). At the same time, relatively few mixed livestock farms (20%) reported a high increase in this type of cost, and none among those specialising in grazing animals and pigs, poultry and rabbits.

A high Increase in long-term investments for the protection of ecosystems and ecosystem services is most typical for farms specialising in Vegetables and mushrooms (57%), Herbivores (80%), Mixed crop production (100%), Crop and livestock production (64%) and Bee families (67%). The lowest share of farms with high costs of this type is in Permanent crops (39%), and in none of the surveyed farms in Pigs, poultry and rabbits.

High increases in management costs and efforts to protect ecosystems and ecosystem services are recorded in most of the farms specialising in Vegetables and Mushrooms and Herbivores (every second of them) and Mixed crop production and Bee Families (all). At the same time, relatively few of the farms in Perennials (21%) and Mixed Livestock (20%), and none of those in Pigs, Poultry and Rabbits reported a high increase in these costs.

For a high increase in the costs of private arrangements and contracts related to the protection of ecosystems and ecosystem services, most farms report in Field Crops (40%) and Bee Families (50%), while in other groups a small number or none of the holdings have growth in these costs.

A high increase in the costs of cooperation and association with others related to the protection of ecosystems and ecosystem services is observed in all farms specialising in beekeeping, while in other categories of farms this type of cost is not typical.

The most numerous are the farms with high Increase in costs for information, training and advice on ecosystem protection and ecosystem services in those specialised in Mixed Crop Production (100%) and Bee Families (67%), and relatively few in Field Crops (17 %) and none for Grazing animals, and Pigs, poultry and rabbits.

Figure 12
Share of farms with a *high* increase in costs and efficiency of activity for the protection of ecosystems and their services in Bulgaria (%)
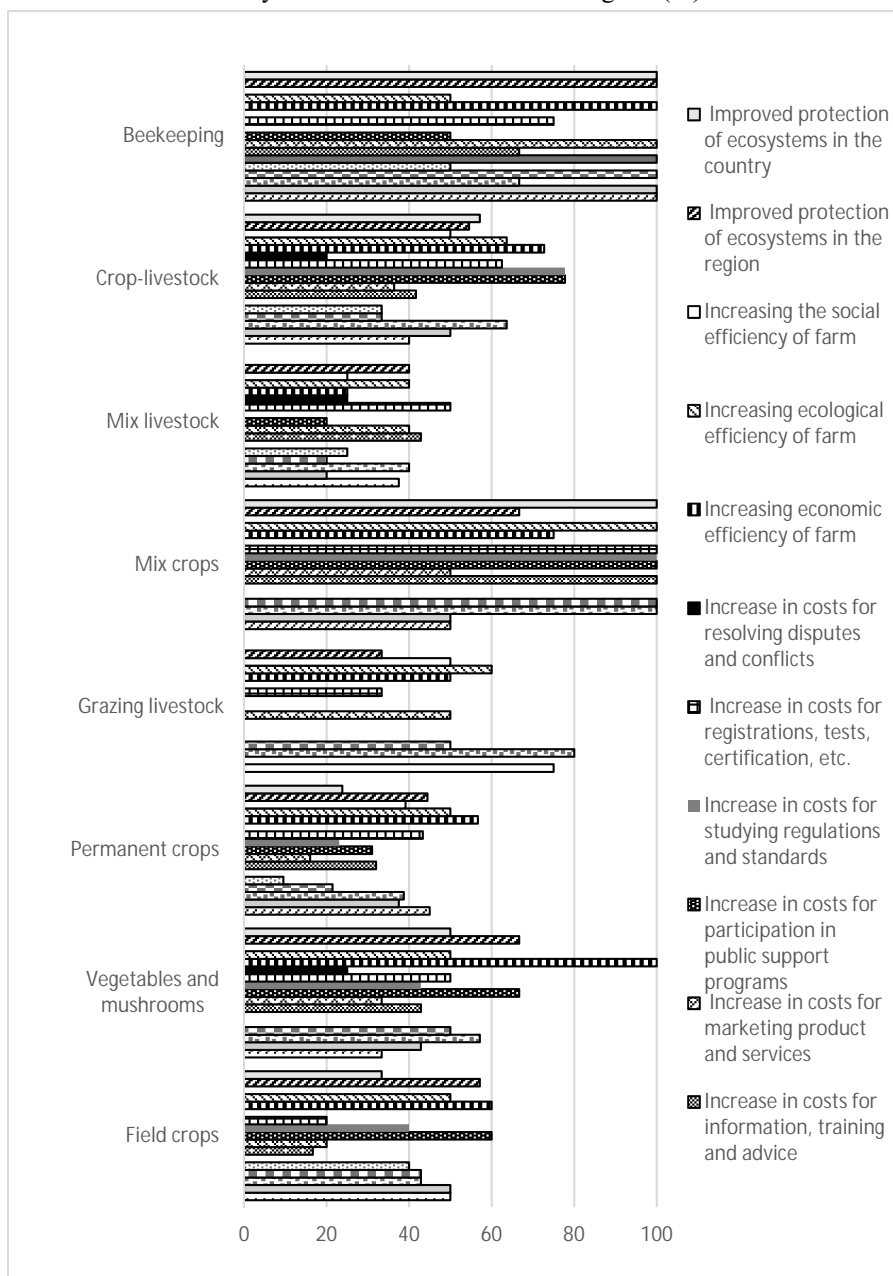
Source: Survey of agricultural producers, 2020.

The largest share of farms with a high increase in the cost of marketing the product and services related to the protection of ecosystems and ecosystem services is in those specialising in grazing animals and mixed crop production (every second of them), bee families (all), relatively few in field crops (20%) and perennials (16%) and none among those in pigs, poultry and rabbits.

Most of the farms report high growth in the costs of participation in state aid programs related to the protection of ecosystems and ecosystem services, among those specialised in field crops (60%), vegetables and mushrooms (67%), mixed crop production (100%), and mix crop-livestock (78%). On the other hand, relatively fewer farms reported similar growth among specialised in perennials (31%) and mixed livestock (20%) and none of those with grazing animals and pigs, poultry and rabbits.

The high growth of expenditures for studying regulations and standards related to the protection of ecosystems and ecosystem services was noted by the largest number of farms with Mixed crop produces (100%) and Crop-livestock specialisation (78%). At the same time, a relatively small proportion of farms specialising in perennials (23%) and none of those in grazing animals, pigs, poultry and rabbits, mixed livestock and bee colonies reported a similar increase in this type of expenditure.

The high growth of expenditures for registrations, tests, certification, etc. related to the protection of ecosystems and ecosystem services is observed in most farms with Mixed Crop Production (100%), Crop-Livestock production (62%) and Bee Families (75%). This share is lowest on farms in field crops (20%) and on none of those in pigs, poultry and rabbits.

High growth in the costs of resolving disputes and conflicts related to the protection of ecosystems and ecosystem services is reported by every fourth farm specialising in Vegetables and Mushrooms and Mixed Livestock and every fifth of those in Bee colonies. However, none of the other holdings reported a similar increase in this type of expenditure.

High increase of the economic efficiency of the farm-related to the protection of ecosystems and ecosystem services is most noted in the farms specialised in Field crops (60%), Vegetables and mushrooms (100%), Mixed crop production (75%), Mix crop-livestock production (73%) and Bee families (100%), and the least in those in Mixed livestock (25%) and Pigs, poultry and rabbits (0).

A high increase of the ecological efficiency of the holdings' activity for the protection of ecosystems and ecosystem services is reported by all from Mixed crops farms, and the majority of those with Grazing animals (60%) and Crop and animal husbandry (64%). The lowest share of farms with similar growth is in those specialised in Mixed Livestock (40%) and Pigs, poultry and rabbits (0).

High Increasing the social efficiency of the holdings' activity for the protection of ecosystems and ecosystem services is registered by every second farm specialising in Herbivores and Corp-livestock, a smaller part of those in Perennial crops (39%) and Mixed livestock (25%), and from none of the other categories of holdings.

High improved protection of ecosystems in the region, related to the activity of farms for protection of ecosystems and ecosystem services is achieved mostly by the farms in Field

crops (57%), Vegetables and mushrooms (67%), Mixed crop growing (67%), and Bee families (100%), and relatively the least of those with Grazing animals (33%) and Pigs, poultry and rabbits (0).

High improved protection of ecosystems in the country related to the activities of farms for protection of ecosystems and ecosystem services is reported by all those specialising in Mixed crops and Bee families, and most of those in Mix crop-animal husbandry (57%). The share of farms with a similar effect is the lowest in those specialised in field crops (33%) and perennials (24%), and in none of them in grazing animals, pigs, poultry and rabbits, and mixed animal husbandry.

The vast majority of farm managers estimate that the effect of the overall activity of the farm is positive in terms of soils (74%), biodiversity (62%), landscape (51%) and economic development of the region (61%) (Figure 13). Also, the majority of managers believe that the effect is positive in terms of Air (49%), Surfacewaters (36%), Groundwaters (47%), Climate (38%), Traditional breeds, varieties, products, technologies. (45%), and Social development of the region (49%), as a relatively smaller part consider a positive effect in terms of Local culture, traditions, customs, education (28%).

However, the share of managers who believe that the whole activity of their farm is not associated with any effect on the individual elements of the ecosystem – Soils (14%), Air (29%), Surfacewaters (34%), Groundwaters (26%), Biodiversity (16%), Landscape (18%), Climate (23%), Traditional breeds, varieties, products, technologies (20%), Local culture, traditions, customs, education (32%), Economic development of the region (16%) and Social development of the region (19%).

In addition, a significant part of managers do not know the effect of the overall activity of agriculture on various elements of the ecosystem – Soils (11%), Air (20%), Surfacewaters (29%), Groundwaters (26%), Biodiversity (22%), Landscape (30%), Climate (35%), Traditional breeds, varieties, products, technologies (32%), Local culture, traditions, customs, educated (37%), Economic development of the region (20%), and Social development of the region (28%). The later requires both deepening and expanding independent assessments of the effects of farming on the individual components of ecosystems, and better informing farmers about their negative and /or positive contribution to environmental protection and ecosystem services.

Just over half of the surveyed managers assess the importance of their activities for the protection of agroecosystems and agroecosystem services as High for their farm (51%) and 47% High for themselves (Figure 14). A significant share of managers also believes that their activities for the protection of agroecosystems and agroecosystem services are of high importance for the region of their farm (27%). There is also a significant number of managers who believe that this activity has a high environmental value (15%) and value for future generations (14%). A relatively smaller part of the managers believes that such activity is of High importance for the community in the region (7%), High market value (6%) and High economic value (6%).

At the same time, an insignificant share of managers is convinced that their activity for the protection of agroecosystems and agroecosystem services has a High contract value (1%),

and a High social value (2%) or is Without any value (1%), as none of the respondents believes that this activity has a High cultural value.

Figure 13

Effect of farms overall activity on different elements of ecosystems and their services in Bulgaria
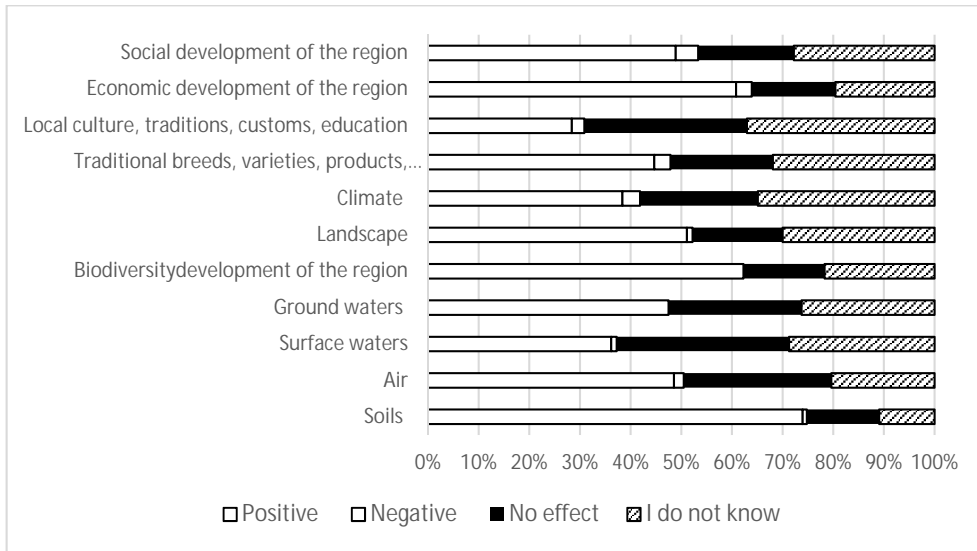
Source: Survey of agricultural producers, 2020.

Figure 14

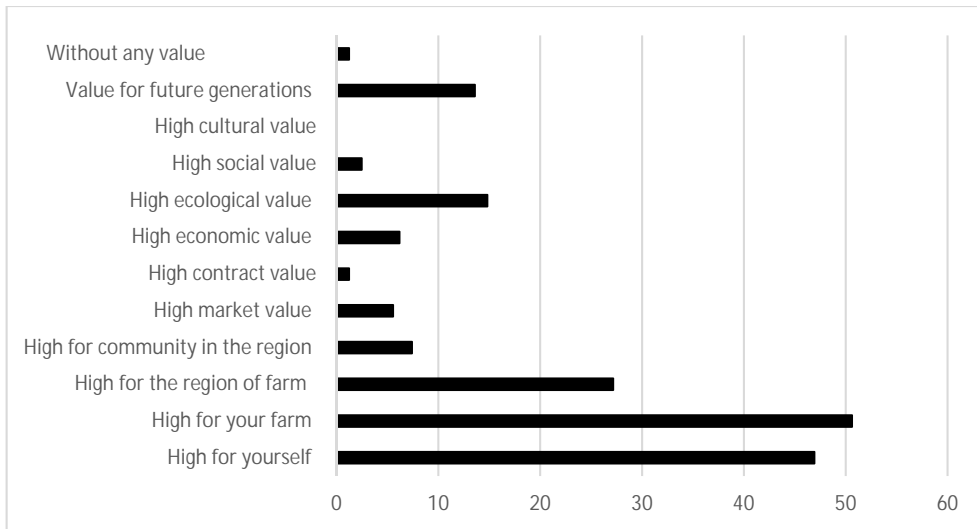Assessment of farm managers of the importance of their activity for the protection of agroecosystems and agroecosystem services in Bulgaria (%)

Source: Survey of agricultural producers, 2020.

7. Factors in the Governance of Agroecosystem Services

The survey allows us to identify personal, organisational, market, institutional and other factors that have the greatest impact on (and predetermine) the activity of agricultural holdings for the conservation of agroecosystems and agroecosystem services.

The extent to which the activity for the protection of the agroecosystems of the affected farms is stimulated or limited by different factors is not the same. Factors that *strongly stimulate* the activity of the majority of agricultural producers for protection of agroecosystems and their services are: Market demand and prices (70%), Market competition (57%), Opportunities to increase profits (79%), Initiatives and pressure of the public and interest groups (61%), The presence of cooperation partners in this activity (55%), Private contracts for the sale of related products and services (65%), Initiatives of other farms (68%), Immediate benefits for the farm in present and near future (83%), Long-term benefits for the farm (86%), Benefits for others (75%), Integration with the supplier of the farm (81%), Integration with the buyer of the production (81%), Integration with processor (80%), Available information and innovation (91%), Proffesional training of managers and employees (92%), Access to farmers' advices (92.5%), Received direct state and European subsididies (91%), Participation in state and European support programs (95%), Tax preferences (68%), Existence of a long-term contract with the state (68%), Positive experience of other farms and organisations (87%), Policies of the European Union (69%), Public recognition of contribution (61%), and Personal conviction and satisfaction with this activity (88%) (Figure 16).

Factors that *severely limit* the activity of the majority of farms for the protection of agroecosystems and their services are the Amount of direct costs for this activity (71%), the Amount of costs for cooperation with other agents (79%), Economic efficiency of costs for this activity (62%), Financial capabilities (59%), Regulatory documents, standards, norms, etc. (77%), State control and sanctions for compliance with standards, norms, etc. (66%), Environmental problems and risks in the farm (79%) and Environmental problems and risks in the region (80%).

At the same time, the Amount of information, training and consultation costs, and the State Policy are factors that strongly stimulate the environmentally friendly activity of half of the surveyed farms, and severely limit it for the other half.

All these factors are to be taken into account when improving public policies and forms of intervention related to the governance of agroecosystems and their services.

Figure 15

Factors that strongly stimulate or restrict the activity of farms related to conservation of agroecosystems (%)
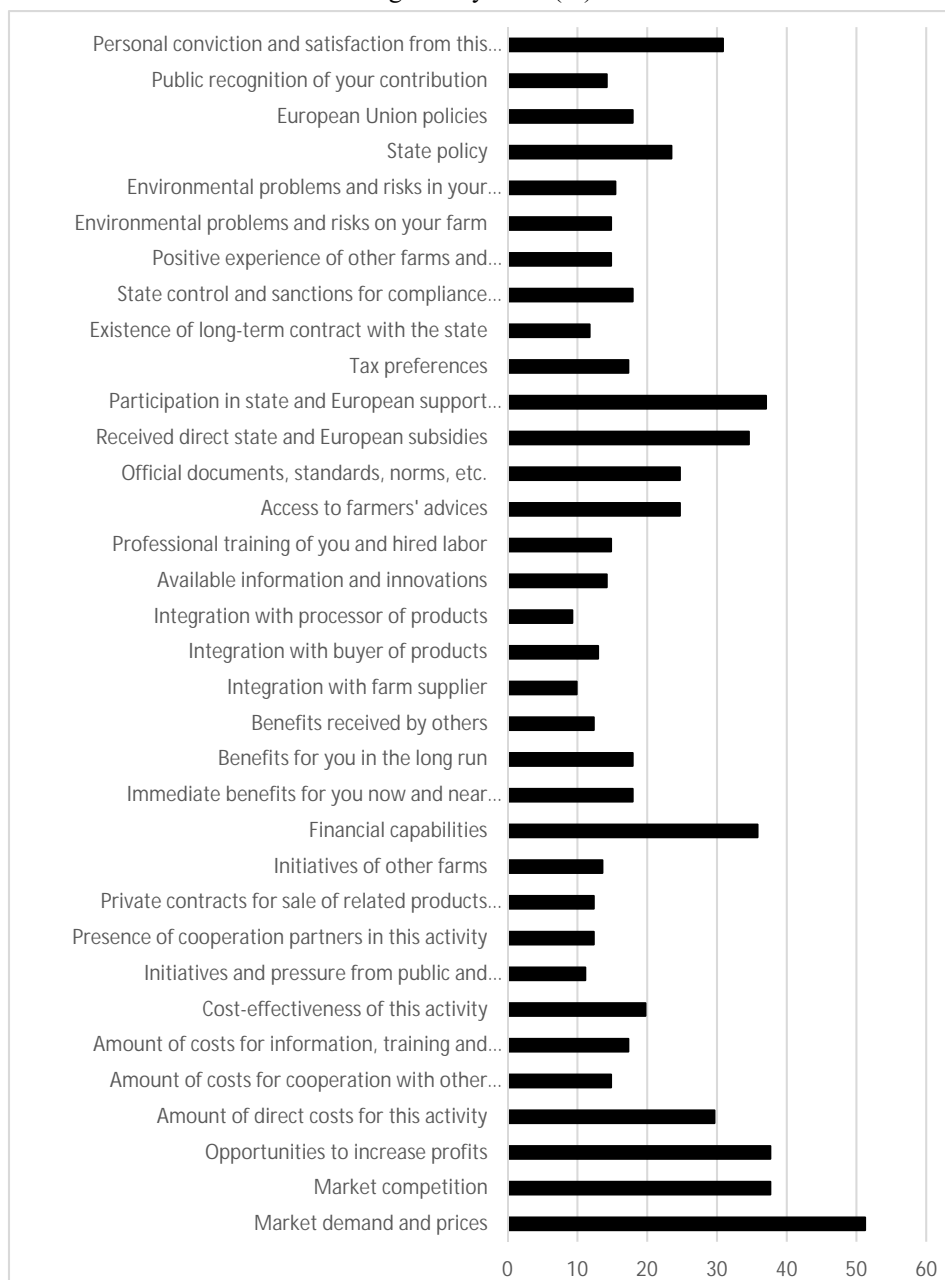
Source: Survey of agricultural producers, 2020.

Figure 16
The extent to which farming activities related to the conservation of agroecosystems are stimulated or limited by various factors in Bulgaria (%)
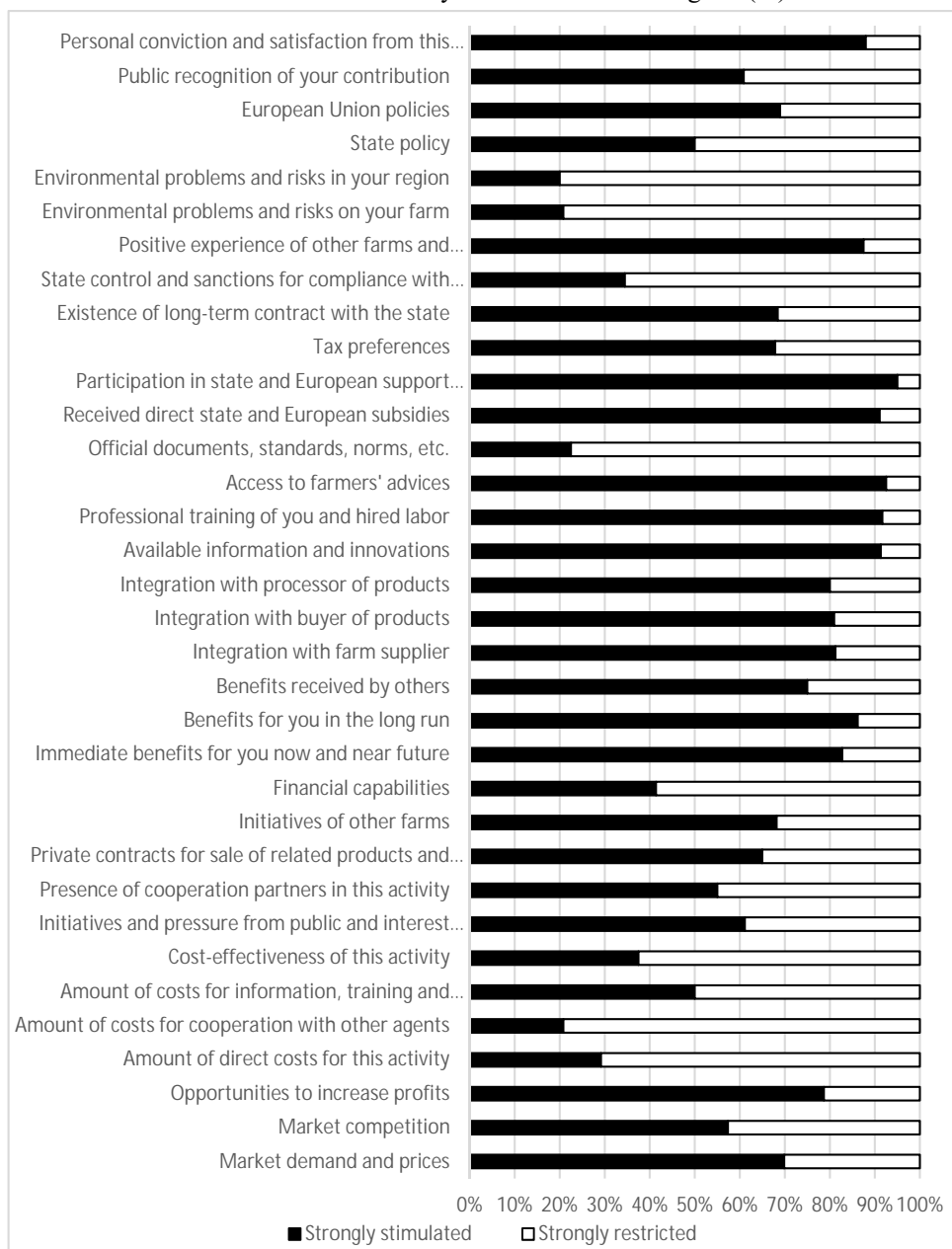
Source: Survey of agricultural producers, 2020

Conclusion

At the current stage of development, Bulgarian farms maintain or provide a great number of essential ecosystem services among which provisioning food and feed, and conservation of elements of the natural environment prevailing. A great variety of private, market, collective and public modes of governance of farm activity related to agroecosystem services have been used. There is significant differentiation of employed managerial forms depending on the type of ecosystem services and specialisation of agricultural holdings. Management of agroecosystem services is associated with a considerable increase in the production and transaction costs of participating farms as well as big socio-economic and environmental effects for holdings and other parties. Factors that mostly stimulate the activity of Bulgarian producers for protection of agroecosystems and their services are participation in public support programs, access to farmers' advice, professional training, available information and innovation, received direct subsidies, personal conviction and satisfaction, positive experience of others, long-term and immediate benefits for the farm, and integration with suppliers, buyers and processors.

The suggested holistic and interdisciplinary framework for analysing the system of management of agroecosystem services is to be extended and improved, and widely and periodically applied in the future. The latter requires systematic in-depth multidisciplinary research in this new area, as well as a collection of original micro-information on forms, efficiency and factors of agroecosystem services management by agents involved in (joint) production and management of agroecosystem services of a different type. The accuracy of analyses is to be improved by increasing representativeness through enlarging the number of surveyed farms and related agents, applying statistical methods, special "training" of implementors and participants, etc. as well as improving the official system for collecting agricultural, agro-economic and agri-environmental information in the country.

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THE INFLUENCE OF UNCERTAINTY ON MARKET EFFICIENCY: EVIDENCE FROM SELECTED EUROPEAN FINANCIAL MARKETS[3]

The purpose of this study is to determine if the capital markets of fourteen European countries are efficient or not. Additionally, we examine the impact of VIX and GEPU returns on the market efficiency of the analyzed capital markets. We apply the Augmented Dickey-Fuller (ADF) test and Threshold GARCH (TGARCH) Model. The period under examination is 2003-2016. Our results show that the explored European markets are highly integrated, and in the context of the Efficient Market Hypothesis (EMH), a division along the line of the developed-developing market has been revealed. The Bulgarian capital market shows a strong degree of integration with the other explored economies in the conditions of EMH. The efficiency of the explored markets is improved by adding to the model VIX and GEPU returns. We prove that diversification can be achieved based on emerging markets of the EU Member States. Prolonged periods of low volatility can further reduce correlations, encouraging further risk-taking.
Keywords: Efficient Market Hypothesis; VIX; GEPU; capital markets volatility; financial crisis
JEL: C22; G01; G14; G15; G32

1. Introduction

According to financial risk management theories, the efficient market hypothesis (EMH) is of primary importance because it can be considered as an element in building an Early Warning System for an upcoming financial crisis. After the global financial crisis of 2008, the following question was raised: „Do unusual levels of financial market volatility imply an increased likelihood of a subsequent financial crisis?" (Danielsson, Valenzuela, Zer, 2016).

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Volatility is important for option traders because it affects options prices. Generally, higher volatility makes options more valuable, and vice versa.

There are two types of volatility: realized and implied. Realized volatility reflects the historical price and fluctuations of the asset. Implied volatility is always forward-looking. It is the expected volatility from now until the option's expiration. The volatility index (VIX) is one of the most popular measurement tools for stock market volatility. VIX measures the 30-day volatility implied by the S&P 500 stock index option prices. Market risk can be low when volatility is low. However, low volatility could be a catalyst for market participants to take on more risk, making the financial system more fragile. This is defined as a phenomenon known as the instability/volatility paradox (volatility paradox).

The financial crisis has created big volatility in the stock prices that induces a restriction in the reflection of full information. Therefore, this situation is a challenge for Efficient Market Hypothesis. According to Efficient Market Hypothesis (EMH), stock prices should always show a full reflection of all available and relevant information and follow a random walk process. Undoubtedly, the global financial crisis of 2008 has affected the efficiency of the capital markets in Europe and the USA.

Efficient Market Hypothesis (EMH) was developed independently by Paul A. Samuelson and Eugene F. Fama in the 1960s. Also, Fama (1965) defined three forms of the informational efficiency of the capital market: weak-form (future prices of the financial assets cannot be estimated using the past values), semi-strong form (current prices reflect all the public information available about the assets), and strong form (current prices reflect all public and non-public information about the assets). In the EMH, one of the important and crucial dogmas is the idea about the information efficiency of the markets. It assumed that the market prices quickly reflect all available information. According to the information efficiency, the market prices are unpredictable and follow a random walk while all information is reflected in the prices. The most common violation of the EMH is that of its weak form, namely that future prices of the financial assets cannot be estimated using the past values.

The main aim of this article is to examine the market efficiency of CAC 40 (France), DAX (Germany), FTSE 100 (The United Kingdom), BEL 20 (Belgium), WIG (Poland), BUX (Hungary), PX (Czech Republic), SOFIX (Bulgaria), BET (Romania), ATHEX20 (Greece), PSI-20 (Portugal), ISEQ-20 (Ireland), IBEX35 (Spain) and Italy (FTSE MIB) on the one hand and the impact of VIX and GEPU returns on the market efficiency of these capital markets on the other hand. The object of the study is the group of fourteen European capital markets – France, Germany, The United Kingdom, Belgium, Poland), Hungary, Czech Republic, Bulgaria, Romania, Greece, Portugal, Ireland, Spain and Italy. The subject of our study is the market efficiency of CAC 40 (France), DAX (Germany), FTSE 100 (The United Kingdom), BEL 20 (Belgium), WIG (Poland), BUX (Hungary), PX (Czech Republic), SOFIX (Bulgaria), BET (Romania), ATHEX20 (Greece), PSI-20 (Portugal), ISEQ-20 (Ireland), IBEX35 (Spain) and Italy (FTSE MIB) considering also the impact of VIX and GEPU returns on the market efficiency of these capital markets. The analyzed period is 2003-2016. We apply the Augmented Dickey-Fuller (ADF) test to estimate the stationary of the examined variables. To test if the capital markets are efficient or not, we apply the Threshold GARCH (TGARCH) Model.

Our results show that the explored European markets are highly integrated, and in the context of the EMH, a division along the line of the developed-developing market has been revealed. The efficiency of the explored markets is improved by adding to the model VIX and GEPU returns. We prove that diversification can be achieved based on emerging markets of EU Member States. Our research study could provide useful and important information for investors on these capital markets. Additionally, our study is relevant for all key players in the capital markets. Prolonged periods of low volatility can further reduce correlations, encouraging further risk-taking. This pro-cyclical behaviour increases investors' risk of losing a systematic shock as volatility jumps and asset-return correlations return to historical levels. Low volatility, corresponding to deteriorating market performance, can directly affect market risk. During such a period, investors underestimate the likelihood of a possible upcoming jump in volatility and financial distress. As far as we know, this is the first research that estimates the simultaneous influence of GEPU and VIX on the market efficiency of the European markets. Estimating the influence, we prove that the expected volatility is an objective assessment of the actual volatility of the return, and therefore, during a market turmoil, VIX is likely to react hastily, which in turn corresponds to investor nervousness and brings potential profits to the options seller.

2. Literature Review

Matteo and Gunardi (2018) study some of the most important market anomalies in France, Germany, Italy, and Spain stock exchange indexes in the first decade of the new millennium (2001-2010) by using statistical methods: the GARCH model and the OLS regression. The analysis doesn't show strong proof of comprehensive Calendar Anomalies and some of these effects are country-specific. Cristi and Cosmin (2018) intend to identify the main studies in the literature that has as the main objective the analysis of the integration of financial systems. The results of the studies are heterogeneous – on the one hand, integration of financial systems is indicated, and, on the other hand, a high degree of heterogeneity is integrated. Also, the recent studies prove that financial markets show a strong correlation between them by applying the methods and models of modern financial technologies and financial deregulation (Jebran et al., 2017; Okičić, 2015; Baumöhl et al., 2018; Huo and Ahmed, 2017; Panda et al., 2019; BenSaïda et al., 2018).

Simeonov (2020) makes a comprehensive stock profile for four of the most popular East Asian stock exchanges-Tokyo, Hong Kong, Taiwan, and Shanghai, for the period 2007-2019. Simeonov (2020) concludes that the global financial crisis of 2008 has a significant and lasting negative impact only on the price component of the stock exchange profiles, while the stock exchange activity of the studied exchanges remains completely unaffected. Simeonov and Peneva (2020) conclude that the investment activity of the Athens Stock Exchange and that of the Bulgarian Stock Exchange experienced a significant decline in the years after the 2008 crisis, with some of the measures showing a variable improvement from 2016 on. What is more, all initial and analytical indicators of stock exchange activity are shown a dozen times a better activity on the Greek Stock Exchange. Viewed and calculated as investors' activity average per capita, the differences across all measures are significantly smaller.

Armeanu and Cioaca (2014) test the EMH in the case of Romania for the period from 2002 to 2014 using four methods, including the GARCH model. They find out that the Romanian capital market is not weak-form efficient. Dragota and Oprea (2014) test the Romanian stock market's informational efficiency and they establish that the predictability of returns suggests that the Romanian stock market has a low level of efficiency. Furthermore, the impact of new information is more intense before and after its release.

Zdravkovski (2016) examines the impact of the 2008 financial crisis on the interconnection among the SEE stock markets (Macedonian, Croatian, Slovenian, Serbian, and Bulgarian) and he finds out no evidence of cointegration between studied markets during the pre- and post-crisis periods. However, during the 2008 financial crisis, the empirical findings support the existence of three cointegration vectors. This means that the recent global financial crisis and the subsequent euro crisis strengthened the connection between the investigated stock markets. Furthermore, the analysis reveals that during periods of financial turmoil, the Macedonian stock market is positively and actively influenced by the Croatian and Serbian markets. A significant implication of these results is that the integration between SEE stock markets tends to alter over time, particularly during stages of financial disturbances.

Joldes (2019) investigates the volatility of daily returns in the Romanian stock market over the period from January 2005 to December 2017. The conditional volatility for the daily return series shows clear evidence of volatility shifting over the period. In the course of the examination, we discovered that there is a great influence of international stock markets on the capital market operations in Romania.

Chiang (2019) examines the efficient market hypothesis by applying monthly data for 15 international equity markets. With the exceptions of Canada and the US, the null for the absence of autocorrelations of stock returns is rejected for 13 out of 15 markets. The evidence also rejects the independence of market volatility correlations. The null for testing the absence of correlations between stock returns and lagged news measured by lagged economic policy uncertainty (EPU) is rejected for all markets under investigation. The evidence indicates that a change of lagged EPUs positively predicts conditional variance.

Yeap and Gan (2017) propose the conceptual framework of stock market efficiency in economic uncertainty. According to the authors, the economic uncertainty, can be categorized into exchange rate uncertainty, monetary policy uncertainty (namely, interest rate uncertainty, money supply uncertainty), inflation uncertainty, and output uncertainty, and is associated with the stock market efficiency. They prove that economic uncertainty contains useful information and is important in determining the stock market efficiency and could promote better efficiency in stock market.

Ruan (2018) explores the influence of market volatility (VIX index) on the stock market and then empirically analyses the stock index data of several countries. The empirical results show that the VIX index has a significant impact on the linkage between stock markets. The VIX index is easy and more intuitive to obtain, providing another way for the dynamic linkage research between the market, which can provide investors with some guidance and advice when conducting financial activities such as diversification.

Traykov et al. (2018) apply the comparative analysis in the continuing quest to find and adapt better practices for management risk, which leads to increased profits and competitiveness of firms. We showed a good and easy risk management using R Language, which can be

useful for a happy and successful career. Trenchev et al. (2019) claim that using 3D modelling is an important tool in teaching students to find alternative solutions for different issues. This technology can be used also in the field of financial markets.

3. Methodology and Data

In this study, we explore fourteen EU Member States (France, Germany, The United Kingdom, Poland, Hungary, Czech Republic, Belgium, Bulgaria, Romania, Greece, Portugal, Ireland, Spain, Italy). The variables that we use, represent the capital market indexes for the following countries: France (CAC 40), Germany (DAX), The United Kingdom (FTSE 100), Belgium (BEL 20), Poland (WIG), Hungary (BUX), Czech Republic (PX), Bulgaria (SOFIX), Romania (BET), Greece (ATHEX20), Portugal (PSI-20), Ireland (ISEQ-20), Spain (IBEX35) and Italy (FTSE MIB). We choose the EU countries listed above based on the following criteria: countries with a developed capital market, the values of which CDS during the crisis of 2008 has not to suffer significant changes (UK, Germany, France, and Belgium, Poland, Hungary, Czech Republic); countries with relatively developing capital markets (emerging markets), which CDS spreads grow immediately after the crisis, but their values gradually decrease during the debt crisis (Bulgaria, Romania); countries with emerging capital markets which CDS spread reaches peak values – "problem countries" (distressed countries) (Greece, Portugal, Ireland, Italy, and Spain). A country's index data is obtained from the internet sources of their capital markets. The data is with monthly frequency. The explored period is March 2003 – June 2016.

We use Global Economic Policy Uncertainty Index (GEPU). The GEPU Index is a GDP-weighted average of national EPU indices for 21 countries: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the United Kingdom, and the United States. Each national EPU index reflects the relative frequency of own-country newspaper articles that contain a trio of terms about the economy (E), policy (P), and uncertainty (U). In other words, each monthly national EPU index value is proportional to the share of own-country newspaper articles that discuss economic policy uncertainty in that month.

The volatility index (VIX) is a popular measure of the stock market's expectation of volatility based on S&P 500 index options. It is calculated and disseminated on a real-time basis by the CBOE (Chicago Board Options Exchange) and is often referred to as the fear index or fear gauge. Low VIX values do not necessarily indicate that there is impending financial stress. A high level of VIX suggests more fear. Volatility is often measured as the standard deviation of historical returns and it is used as a proxy for risk (Markowitz, 1952).

In 1993 Chicago Board Options Exchange (CBOE) introduced the volatility index, also known as VIX. After the recent 2008 financial crisis, financial media regularly report on VIX dynamics along with stock market indices dynamics. Whaley (1993) suggests that the VIX provided a "reliable estimate of expected short-term market volatility. Additionally, Whaley (2009) argues that the main attraction was its forward-looking nature, "measuring volatility that investors expect to see". We can assume that VIX is the investors' sentiment index and it is the barometer of future stock market risk. In general, VIX is constructed using observed

option prices. The market participant buys call/put options to hedge/trade the volatility, and the same observed option price is used to derive VIX in real-time (Shaikh and Padhi, 2015). Additionally, Whaley (2000) points out that a high level of VIX is observed due to the high degree of market turmoil.

We divide the explored period into two sub-periods: Period 1 – crisis period (March 2003 – September 2011) and Period 2 (September 2011 – June 2016). The division above was made based on the peak values of VIX and GEPU in 2011, which were significantly higher than in 2008. The division above was made based on the peak values of VIX and GEPU in 2011, which was higher than in 2008 (GEPU) or almost equal to the level in 2008 (VIX). The dynamic of the explored indexes of uncertainty is exposed in Graph 1.

Graph 1

Dynamics of GEPU and VIX for the period 2003-2016
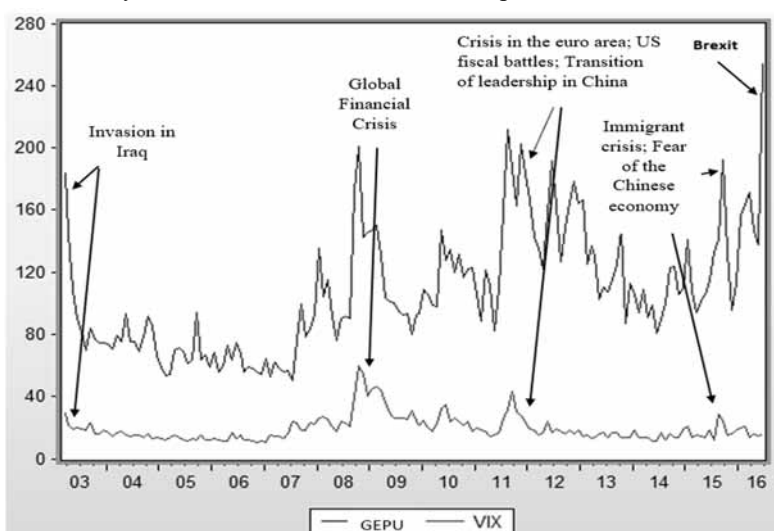
Source: Authors' estimation, based on the data from https://ww2.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-historical-data and https://www.policyuncertainty.com/global_monthly.html.

GEPU index rapidly increases as a response to the US invasion of Iraq in 2003; the global financial crisis of 2008; the European migrant crisis and fear about China's economy at the end of 2015; and The Brexit referendum in June 2016. GEPU fluctuates around consistently high levels from mid-2011 until the beginning of 2013. This period is characterized by recurring debt and banking crises in the Eurozone, intense battles over fiscal and health policy in the United States, and the transition to General leadership in China. The average value of GEPU index is 60% higher during the period July 2011 – August 2016 than in the previous fourteen years period. What is more, the average value of GEPU index in July 2011 is 22 percent higher than in 2008-2009, when policymakers faced the worst economic crisis since the Great Depression of the 1930s. These results suggest that policy-related issues have become a major source of economic uncertainty in recent years.

Graph 1 shows two high values for VIX, coinciding with the mortgage crisis in 2008, and instability in the US in 2011. VIX dynamics present cyclical periods of small and large changes with irregular intervals. Sudden upward spikes of VIX are followed by a relatively slow return to the average value. Low values of VIX do not necessarily mean that severe financial stress is unlikely to occur.

We can make two important remarks here. First, there is historically a strong relationship between the two variables – GEPU and VIX. Second, the dynamics of GEPU and VIX are not synchronized for the period 2013-2016. Graph 1 can be used to target the vulnerability of capital markets, given that based on such measures, capital markets do not reflect deteriorating conditions.

The data used in this study is the following: monthly values of the studied stock indices, VIX, GEPU for the period 03.03.2003 – 01.07.2016 and we calculate the return of these variables:

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

(1)

Where:

r_t - the return of the explored variable at time t;

PI_t – the value of the variable at time t;

PI_{t-1} - the value of the variable at time t-1.

We apply the ADF test to estimate stationarity. We prove that all variables are stationary in the form dlog (x) i.e. variables were integrated of order 1.

- **Argument Dickey-Fuller Test**

The Augmented Dickey-Fuller (ADF) test constructs a parametric correction for higher-order correlation by assuming that the y series follows an AR (p) process and adding p lagged difference terms of the dependent variable y to the right-hand side of the test regression:

$$\Delta y_t = \alpha y_{t-1} + x_t' \delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + ... + \beta_p \Delta y_{t-p} + v_t$$

(2)

- **The Threshold GARCH (TGARCH) Model**

TARCH or Threshold ARCH and Threshold GARCH were introduced independently by Zakoïan (1994) and Glosten, Jaganathan, and Runkle (1993). The generalized specification for the conditional variance is given by:

$$\sigma_t^2 = \omega + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^2 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{k=1}^{r} \gamma_k \varepsilon_{t-k}^2 I_{t-k}$$

(3)

where $I_t = 1$ if $\varepsilon_t < 0$ and 0 otherwise.

In this model, good news, $\varepsilon_{t-i} > 0$, and bad news $\varepsilon_{t-i} < 0$, have differential effects on the conditional variance; good news has an impact on α_i, while bad news has an impact $\alpha_i + \gamma_i$. If $\gamma_i > 0$ bad news increases volatility, and we say that there is a *leverage effect* for the i-th order. If $\gamma_i \neq 0$, the news impact is asymmetric.

We use TGARCH(p,q) for testing the market efficiency of the examined capital markets and the impact of VIX and GEPU returns on the market efficiency. The selection of values p and q for used models is based on testing different combinations of values by applying the Likelihood ratio hypothesis test (LRHT) and Akaike information criteria (AIC) test. The output combinations of parameters p and q are determined by the maximum value of 2 for both parameters and thus tested are the following combinations: (1,1), (2,1), (1,2), and (2,2). We have tested the following distributions: Normal (Gaussian), Student's t, Generalized Error, Student's t with fixed df and GED with fixed parameter. The selection procedure tries to find a combination of the two parameters that leads to more successful modelling of the studied data. The appropriate model has been chosen for each index.

Table 1

The most appropriate TGARCH model for the study of individual stock indices in the analyzed periods

Indices	Period 1 – crisis period (March 2003-September 2011)	Period 2 (September 2011-June 2016)
CAC 40	TGARCH(2,1)- t	TGARCH(2,1)- t
DAX	TGARCH(2,2)- t	TGARCH(2,1)- t
FTSE 100	TGARCH(1,1)- t	TGARCH(1,2)- t
BEL 20	TGARCH(2,1)- t	TGARCH(2,2)- t
WIG	TGARCH(2,1)- t	TGARCH(2,1)- t
PX	TGARCH(1,2)- t	TGARCH(2,2)- t
BUX	TGARCH(1,1)- t	TGARCH(1,1)- t
SOFIX	TGARCH(1,1)- t	TGARCH(2,1)- t
BET	TGARCH(2,1)- t	TGARCH(2,2)- t
ATHEX20	TGARCH(1,2)- t	TGARCH(1,2)- t
PSI-20	TGARCH(1,1)- t	TGARCH(1,1)- t
ISEQ-20	TGARCH(2,1)- t	TGARCH(1,1)- t
IBEX35	TGARCH(2,2)- t	TGARCH(2,1)- t
FTSE MIB	TGARCH(2,1)- t	TGARCH(2,1)- t

Source: Authors' Calculations.

We can represent the return model as follows:

$$Y_t = C + \phi_1 Y_{t-1} + \varepsilon_t + \phi_2 X_{t-n} \tag{4}$$

Where:

C – regression constant;

Y_{t-1} – the return of the index in time $t-1$;

ϕ_1 и ϕ_2 – regression coefficients;

X_{t-n} – the return of VIX index and GEPU in measurement $t - n$

Information efficiency as an indicator will be measured by the value of the coefficient of persistence, which determines the impact of disturbances of previous periods on volatility in the research period. High values of this coefficient indicate low information efficiency, which is expressed in the slower inclusion of information in the market and vice versa at low values of this coefficient.

4. Results

4.1. Analysis of the coefficient of persistence

The assumption that there is a leverage effect (Black, 1976) in stock markets indicates a tendency for changes in the price of financial assets, and these changes are negatively correlated with changes in the volatility of the same assets.

Our analysis of the values of coefficients of persistence is based on the Efficient Market Hypothesis (EMH) assumptions, namely: low coefficients of persistence indicate a high degree of information efficiency. Thus, a lower coefficient of persistence values confirms the weak form of EMH. Based on the following researches, we accept that the mean values of the coefficient of persistence are a reliable measure of efficiency: Simeonov (2015), Tsenkov and Georgieva (2016), Abonongo et al. (2016).

We can separate the examined indices into two groups according to the values of the coefficient of persistence for period 1. To examine the market efficiency, we have calculated an average arithmetic value of the coefficients of the persistence of all the studied indices for the crisis period 1. In our case, it has a value of 0.91:

- Indices with relatively high market efficiency (the value of their coefficient of persistence is below 0.91);

- Indices with relatively low market efficiency (the value of their coefficient of persistence is higher than 0.91).

The first group contains the following indices – DAX, FTSE 100, IBEX 35, ATHEX, BEL 20, WIG, PX, BET, and PSI 20 indices with coefficients of persistence below 0.91 (Table 2). To put it another way, the indices from the first group are relatively highly efficient. These results show that there is a decrease in the impact of market shocks on volatility dynamics.

The second group includes CAC 40, BUX, ISEQ-20, SOFIX, and FTSE MIB which coefficients of persistence are higher than 0.91 (Table 2). What is more, these indices above are with relatively low market efficiency. The higher value of coefficients of persistence represents the change in the response of shocks to volatility persistence, which implies that the response of volatility increases with time.

In summary, it should be noted that the capital markets of Germany, France, The United Kingdom, Poland, the Czech Republic, Spain, Greece, Belgium, Romania, and Portugal are relatively informationally efficient. The most efficient is the Greek capital market with the

coefficient of persistence (0.804904). The positive statistically significant values of leverage coefficients are in the range between 0.113571 (PX) and 0.280531 (WIG).

Table 2

The indices with relatively high market efficiency and their coefficients of persistence below 0,91 and leverage coefficients for period 1

Index	Coefficient of persistence < 0.91	Leverage coefficient
DAX	0.853706	0.220670*
FTSE 100	0.842815	0.238910*
WIG	0.873201	0.280531*
PX	0.892861	0.113571*
IBEX 35	0.865174	-0.156829
ATHEX	0.804904	0.183728
BEL 20	0.888098	-0.439441
BET	0.854704	0.261555**
PSI 20	0.883428	-0.069209
CAC 40	0.903009	0.149206*

*Notes: *, ** denote statistical significance at the 1% and 5% respectively.*
Source: Author's Calculations.

Table 3 presents the values of the coefficient of persistence and leverage coefficient for the capital markets with relatively low market efficiency for crisis period 1. We can conclude that Bulgarian, Italian, and Irish capital markets are relatively informationally inefficient markets compared to the other examined markets. Also, we register the highest value of the coefficient of persistence for the Irish index (1.100299). Leverage coefficients are positive and statistically significant for ISEQ-20.

Table 3

The indices with relatively low market efficiency and their coefficients of persistence higher than 0.91 and leverage coefficients for period 1

Index	Coefficient of persistence > 0.91	Leverage coefficient
ISEQ-20	1.100299	0.502254**
SOFIX	0.981382	-0.026806
FTSE MIB	1.003057	0.340572
BUX	0.993480	0.102803

*Notes: *, ** denote statistical significance at the 1% and 5% respectively.*
Source: Authors' Calculations.

Similarly, we can separate the examined indices into two groups according to the values of the coefficient of persistence for period 2. Again, to examine the market efficiency, we have calculated an average arithmetic value of the coefficients of the persistence of all the studied indices for the post-crisis period 2. In this case, it has a value of 0.93:

- Indices with relatively high market efficiency (the value of their coefficient of persistence is below 0.93);

- Indices with relatively low market efficiency (the value of their coefficient of persistence is higher than 0.93).

Based on the results presented in Table 4, we prove that most of the studied stock indices are efficient considering their coefficients of persistence which are below 0.93. It should be noted that despite the increase in the number of efficient capital markets with a lower coefficient of persistence for period 2 compared to period 1, the average value of the coefficient of persistence for period 1 is lower than the average value of the coefficient of persistence for period 2.

Table 4

The indices with relatively high market efficiency and their coefficients of persistence below 0.93 and leverage coefficients for period 2

Index	Coefficient of persistence < 0.93	Growth rate	Leverage coefficient
BEL 20	0.887135	-0,11%	-0.428131
BET	0.850104	-0,54%	0.310524**
CAC 40	0.890612	-1,37%	0.130323**
DAX	0.808175	-5,33%	0.200558**
FTSE 100	0.853702	1,29%	0.214602**
IBEX 35	0.873406	0,95%	-0.160335**
PSI 20	0.890351	0,78%	-0.070425
SOFIX	0.882015	-10,12%	-0.072651
WIG	0.862835	-1.18%	0.213501*
PX	0.923518	3.43%	0.116802*

*Notes: *, ** denote statistical significance at the 1% and 5% respectively.*
Source: Authors' Calculations.

Comparing the results for both periods, we prove that the developed capital markets are efficient – DAX, CAC 40, FTSE 100, BEL 20, WIG and PX. These results may be explained by the high integration of these financial markets. We observe the lowest value of the coefficient of persistence in the German DAX. This may be explained by the good performing of Germany after the financial crisis. This is proved by the income per capita growth, which corresponds with growth in employment.

The different performance of the financial markets of Poland, Hungary and the Czech Republic may be explained with the difference in the privatization process of these countries resulted in significant changes in their stock market structures. While Hungary remained completely stable in terms of the number of stocks listed, Poland maintained an upward trend and the Czech Republic a declining trend. The relative abruptness of the Czech Republic privatization process led to many newly-listed companies gradually fading from the scene (Corredor et al., 2015).

Despite the proven improvement in the market efficiency of the Bulgarian SOFIX during period 1 and period 2, the main shortcomings of the Bulgarian capital market continue to be related to low liquidity, a small volume of freely traded shares, high transaction costs, limited internet trading and small retail investors. Low liquidity is a major drawback of the capital market in Bulgaria. It is due to the small volume of freely traded shares, as well as the outflow of foreign investors from the Bulgarian capital market during the financial and economic crisis. The limitations that operate at the institutional level are related to the lack of a functioning clearing system, without which the development of the derivative market in Bulgaria cannot take place, the large differences of the Bulgarian capital market compared to

developed European capital markets, lack of political will for change, etc. The impact of problematic factors, such as high levels of corruption, limited access to finance and the low efficiency of institutions, on market efficiency can also be taken into account here.

Despite the undeniable and indisputable progress and development of the Romanian capital market and the improvement of its efficiency considering period 1 and period 2 factors such as the slow and unfinished privatization process, weak interest from foreign investors, low liquidity trading have a negative impact on the market efficiency of this stock exchange.

Comparing the efficiency of the emerging markets (Bulgarian and Romania) between period 1 and period 2, we observe a higher level of information efficiency during the crisis period (period 1) because these markets follow the negative market news that leads to long-term market trends.

We register positive statistically significant values for leverage coefficient of BET, CAC 40, DAX, FTSE 100, WIG, and PX and only the leverage coefficient of Spanish index IBEX 35 is with a negative value (-0.160335).

Table 5

The indices with relatively low market efficiency and their coefficients of persistence higher than 0.93 and leverage coefficients for period 2

Index	Coefficient of persistence > 0.93	Growth rate	Leverage coefficient
ATHEX	1.218971	51,44%	0.174261
ISEQ-20	1.093603	-0,61%	0.523026**
FTSE MIB	1.012835	0,97%	0.385705
BUX	0.983568	-1%	0.253826*

Notes: *, ** denote statistical significance at 1% and 5% respectively.
Source: Authors' Calculations.

We can conclude that Greek, Italian, Hungarian, and Irish capital markets are relatively informationally inefficient markets compared to the other examined markets.

The most inefficient capital market in the group is the Greek market, with a coefficient of persistence (1.218971). Probably the main reason for the market inefficiency of the Greek stock exchange is the fact that at the end of 2009, the Greek economy was facing one of the most severe crises due to a combination of international and domestic factors. Some of these factors are related to the Greek state budget, which is poorly structured and balanced, with a high annual deficit. To finance this deficit, Greece is forced to regularly assume new government debt, and thus the country's net debt is constantly increasing. The sovereign debt crisis, in turn, lowers the country's credit rating, and it is deprived of access to cheap capital resources on the free financial market, which in turn further aggravates the situation and Greece is unable to finance its budget deficit, which inevitably affects and on market efficiency.

We observe high levels of inefficiency in Irish and Italian stock markets. These results assume that the investors do not have the same levels of information to predict future returns, which lead to problems of asymmetric information in these financial markets. Besides the inefficient capital markets, during the explored period, these countries are characterized by high current account and budget deficits, high levels of unemployment which may be

considered as a result of slow output realization. The financial markets of the aforementioned countries are highly influenced by the solvency problems. Actually, we proved that during the explored periods, some of the financial markets from the PIIGS are considered as efficient and others as inefficient, these results prove that despite considering this group of countries as homogenous, there are differences that may be based on the regime on public expenditures, tax revenues.

We register two statistically significant leverage coefficients (ISEQ-20 – 0.523026 and BUX – 0.253826).

It can be assumed that during period 1 and period 2 for the inefficient markets, new information has a strong impact on volatility (see the values of the leverage coefficient in tables 3 and 5), but this influence is significant for a small group of markets which is proved by the results of the statistical significance of the leverage coefficients. Here, it should be clarified that the leverage ratio in the BUX registered a strong positive significant value for period 2, which shows that market news leads to a significant reduction of volatility, marking the presence of a strong negative trend, further strengthened by short-term market news.

4.2. Analysis of the change of coefficient of persistence considering the impact of VIX and GEPU returns

The validity of efficient market prices is challenged by the lack of information, the lack of knowledge, and the lack of experience. Under the market uncertainty theorem, market behaviour is interpreted with reference to market prices and market uncertainty (Slovik, 2011). This is the main reason that we explore the relationship between the market uncertainty theorem and the EMH in the context of revealing the impact of GEPU and VIX on the coefficients of persistence.

Based on the results of the AIC test for the whole period under examination, presented in Table 6 we can conclude the following:

- If the AIC for the model with VIX is lower than the base model, then we conclude that the uncertainty measure matter. Including in the model of stock returns the VIX and GEPU returns, it increases the explanatory power of the model. The only exception is the Belgian stock index BEL 20. To sum up, information influences from VIX and GEPU returns affect the returns of the studied stock indices to the extent that they are explanatory variables, which leads to a significant improvement in the explanatory power of econometric models covering the returns from the studied European stock indices for the period 2003-2016.

- Registering identical results as a manifestation of the use of returns from VIX and GEPU as an explanatory variable concerning stock indices leads to the conclusion that there is a common mechanism for reflecting the information influences of these indicators. This reconfirms the results of Danielsson, Valenzuela, Zer (2016). They also prove that volatility causes financial stress in stock markets.

Table 6

The change of coefficient of persistence considering the impact of VIX and GEPU returns for the whole period under examination

Index	Coefficient of persistence	With VIX	With GEPU
ATHEX	1.838203	1.723665	1.588395
AIC	-7.497055	-6.100906	-6.101060
BET	0.895839	0.986595	0.895683
AIC	-2.402907	-2.242266	-2.362008
BEL 20	1.015379	1.015724	1.016758
AIC	-5.913716	-5.921241	-5.908017
CAC	0.828806	0.762835	0.817735
AIC	-3.358353	-3.874047	-3.460944
DAX	0.666247	0.657432	0.573075
AIC	-3.121344	-3.127424	-3.156653
FTSE 100	0.756942	0.886743	0.756297
AIC	-3.875027	-3.340955	-3.875625
IBEX 35	0.795043	0.790578	0.845945
AIC	-3.139067	-3.458924	-3.179145
ISEQ-20	0.942459	0.865063	0.655654
AIC	-3.102656	-3.395003	-3.458247
PSI 20	0.863198	0.842642	0.841712
AIC	-3.724335	-3.701927	-3.788168
SOFIX	0.849258	0.894234	0.892531
AIC	-2.577884	-2.479014	-2.675238
FTSE MIB	0.951364	0.938610	0.918452
AIC	-4.81427	-4.903557	-5.622138
WIG	0.783280	0.762830	0.768290
AIC	-3.26801	-3.15728	-3.06258
PX	0.798361	0.792146	0.772835
AIC	-4.28153	-4.03861	-3.81650
BUX	0.903541	0.900341	0.883508
AIC	-5.28161	-5.01461	-2.93816

Notes: AIC – Akaike Information Criterion
Source: Author's Calculations.

The results for the change in the values of the coefficient of persistence are presented in Table 6. We can assume that adding the VIX and GEPU returns in the model of stock returns leads to an increase in its information efficiency, except for the Belgian stock index BEL 20. Based on the results, we show that uncertainty influences stock prices and that corresponds to an influence on the stock market efficiency. These results prove the conclusions of Yeap and Gan (2017). The dynamics of the VIX have a stronger impact on the volatility and return of CAC and IBEX 35, rather than the on other stock indexes. When we include GEPU return in the TGARCH model, the values of coefficient of persistence decrease for the stock indices ATHEX, BET, DAX, FTSE 100, ISEQ-20, PSI20, SOFIX, WIG, PX, BUX and FTSE MIB. We consider this as evidence of the presence of information impact of GEPU and its rapid absorption in the values of the above indices, since the decrease in the coefficient of persistence is a consequence of increased information efficiency, i.e. accelerated inclusion of new information in the index values.

Considering the results presented in Tables 7 and 8, we find out that the use in the model of ATHEX, BEL 20, FTSE 100, IBEX 35, ISEQ-20, DAX, CAC 40, SOFIX, reflecting the return of VIX and GEPU leads to the more significant increase in its explanatory power in period 1 than in period 2. We can summarize that in Period 1, which is the crisis period, the information influences of VIX and GEPU have such an impact on stock indices, that explanatory variables are leading to an improvement in their efficiency.

Table 7

The change of coefficient of persistence considering the impact of VIX and GEPU returns for period 1

Index	Coefficient of persistence	With VIX	With GEPU
ATHEX	0.804904	0.803271	0.800196
AIC	-2.059136	-2.264831	-2.984650
BET	0.854704	0.958594	0.874634
AIC	-1.937541	-1.96005	-1.987346
BEL 20	0.881098	0.825405	0.809295
AIC	-5.342185	-5.441273	-5.540523
CAC	0.903009	0.943559	0.822287
AIC	-3.399026	-3.257475	-3.416777
DAX	0.853709	0.807655	0.873401
AIC	-3.052084	-3.062769	-3.043736
FTSE 100	0.842815	0.803913	0.783805
AIC	-3.814811	-4.308056	-3.837846
IBEX 35	0.865174	0.816519	0.831486
AIC	-2.973561	-3.333096	-3.201461
ISEQ-20	1.100299	0.980888	0.882468
AIC	-2.917598	-3.000664	-3.173071
PSI 20	0.883428	0.920016	0.933585
AIC	-3.222176	-3.143341	-3.196074
SOFIX	0.981382	0.996802	0.980602
AIC	-2.176525	-1.999665	-2.248392
FTSE MIB	1.003057	1.003084	1.012864
AIC	-4.182465	-4.182454	-4.248315
WIG	0.873201	0.852813	0.872651
AIC	-3.97051	-3.02810	-3.26502
PX	0.892861	0.882857	0.852802
AIC	-6.21357	-6.03581	-5.28136
BUX	0.993480	1.280275	1.357601
AIC	-5.88214	-6.28351	-6.73405

Source: Authors' Calculations.

We observe a decrease in the values of coefficient of persistence by adding VIX and GEPU return in the model for ATHEX, BEL 20, FTSE 100, IBEX 35, WIG, PX and ISEQ-20 in period 1. We register a decrease in the values of coefficient of persistence due to the influence of VIX and GEPU for BET, DAX, IBEX 35, FTSE MIB for period 2 (2011-2016), which is characterized by more pronounced "bottoms" of volatility.

Table 8

The change of coefficient of persistence considering the impact of VIX and GEPU returns for period 2

Index	Coefficient of persistence	With VIX	With GEPU
ATHEX	1.218917	1.219361	1.028031
AIC	-5.083261	-5.014328	-5.213681
BET	0.850101	0.823671	0.834672
AIC	-4.810352	-4.990235	-4.853468
BEL 20	0.887135	0.903261	0.928034
AIC	-3.281745	-3.257025	-2.890352
CAC	0.890612	0.873025	0.894231
AIC	-6.380253	-7.873261	-6.320421
DAX	0.808175	0.793265	0.801365
AIC	-3.263451	-3.482731	-3.203216
FTSE 100	0.853702	0.832472	0.862041
AIC	-3.817266	-4.028351	-3.528031
IBEX 35	0.873406	0.870324	0.854281
AIC	-2.356710	-2.356931	-2.568903
ISEQ-20	1.093603	1.203805	0.983416
AIC	-5.680341	-4.890454	-5.936028
PSI 20	0.890351	0.892165	0.873571
AIC	-9.110412	-9.035724	-9.281435
SOFIX	0.882015	0.870451	0.932816
AIC	-2.961531	-3.210814	-2.713852
FTSE MIB	1.012835	1.002148	0.983251
AIC	-2.280415	-2.351826	-4.218351
WIG	0.862835	0.860520	0.782135
AIC	-3.35016	-3.28019	-3.02145
PX	0.923518	0.883528	0.892831
AIC	-4.28351	-3.61871	-3.89281
BUX	0.983568	1.093417	1.283506
AIC	-3.88415	-4.28573	-4.61058

Source: Authors' Calculations.

5. Conclusion

The explored European markets are highly integrated, and in the context of the EMH, a division along the line of the developed-developing market has been proven. The relative efficiency of the developed economies during the examined period has been established. The Bulgarian capital market shows a strong degree of integration with the other explored economies in the conditions of EMH. In summary, the capital markets of Germany, The United Kingdom, Poland, the Czech Republic, Spain, Greece, Belgium, Romania and Portugal are relatively informationally efficient for period 1 in terms of the weak form of EMH. The most efficient one in the group is the Greek capital market for period 1. We can conclude that French, Bulgarian, Italian, and Irish capital markets are relatively informationally inefficient markets compared to the other examined markets during period 1. In period 2, the number of efficient financial markets has increased. Additionally, only Greek, Italian, Hungarian, and Irish capital markets are relatively informationally inefficient

markets in period 2. We may recommend active portfolio management for the less efficient markets and passive portfolio management in the efficient financial European markets.

There was a deterioration in market efficiency during the period with low levels of volatility compared to period 1. Analyzing the results of the market efficiency study, using the market dynamics of the indices of the EU countries, it can be concluded that regional diversification is possible and feasible. Diversification can be achieved based on emerging markets of EU Member States. After all the above, we can add that during period 2, which includes the sovereign debt crisis, the behaviour of examined indices is characterized by synchronicity and homogeneity. We can assume that this increased degree of synchronicity and integration is one of the reasons for the severe effects of the debt crisis on their economies.

The efficiency of the studied markets is improved by adding to the model VIX and GEPU returns. This trend is most pronounced during period 1. We also register an improvement in the explanatory power of the model. It is also proven that the expected volatility is an objective assessment of the actual volatility of the return and therefore, during a market turmoil VIX is likely to react hastily, which in turn corresponds to investor nervousness and brings potential profits to the options seller. We prove that uncertainty, represented by VIX and GEPU, contains useful information for a bunch of decision-makers about the conclusion that uncertainty is important in determining the stock market performance.

Prolonged periods of low volatility can further reduce correlations, encouraging further risk-taking. This pro-cyclical behaviour increases investors' risk of losing a systematic shock as volatility jumps and asset-return correlations return to historical levels. Low volatility, corresponding to deteriorating market performance, can directly affect market risk. During such a period, investors underestimate the likelihood of a possible upcoming jump in volatility and financial distress.

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Unit Root Results

Null Hypothesis: D(ATHEX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic – based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.95154	0.0000
Test critical values:	1% level	-3.471987	
	5% level	-2.879727	
	10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ATHEX,2)

Method: Least Squares

Sample (adjusted): 3 160

Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ATHEX(-1))	-0.865276	0.079010	-10.95154	0.0000
C	1.064082	6.053694	0.175774	0.8607

R-squared	0.434652	Mean dependent var	-0.573369
Adjusted R-squared	0.431028	SD dependent var	100.8489
SE of regression	76.07055	Akaike info criterion	11.51378
Sum squared resid	902729.6	Schwarz criterion	11.55254
Log likelihood	-907.5884	Hannan-Quinn criter.	11.52952
F-statistic	119.9362	Durbin-Watson stat	2.005338
Prob(F-statistic)	0.000000		

Null Hypothesis: D(BEL_20) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic – based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.961328	0.0000
Test critical values:	1% level	-3.472534	
	5% level	-2.879966	
	10% level	-2.576674	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(BEL_20,2)

Method: Least Squares

Sample (adjusted): 5 160

Included observations: 156 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BEL_20(-1))	-1.262791	0.126769	-9.961328	0.0000
D(BEL_20(-1),2)	0.316203	0.098298	3.216791	0.0016
D(BEL_20(-2),2)	0.237364	0.074153	3.201012	0.0017
C	-0.010897	3.342605	-0.003260	0.9974

R-squared	0.504290	Mean dependent var	0.040257
Adjusted R-squared	0.494506	SD dependent var	58.69119
SE of regression	41.72833	Akaike info criterion	10.32554
Sum squared resid	264670.5	Schwarz criterion	10.40375
Log likelihood	-801.3924	Hannan-Quinn criter.	10.35731
F-statistic	51.54356	Durbin-Watson stat	2.023541
Prob(F-statistic)	0.000000		

Null Hypothesis: D(BET) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic – based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.01429	0.0000
Test critical values:	1% level	-3.471987	
	5% level	-2.879727	
	10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BET,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BET(-1))	-0.961319	0.080015	-12.01429	0.0000
C	28.83499	37.49088	0.769120	0.4430

R-squared	0.480594	Mean dependent var	0.359557
Adjusted R-squared	0.477265	SD dependent var	650.4944
SE of regression	470.3103	Akaike info criterion	15.15724
Sum squared resid	34505925	Schwarz criterion	15.19601
Log likelihood	-1195.422	Hannan-Quinn criter.	15.17298
F-statistic	144.3431	Durbin-Watson stat	2.007692
Prob(F-statistic)	0.000000		

Null Hypothesis: D(CAC_40) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.12143	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CAC_40,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CAC_40(-1))	-0.882012	0.079307	-11.12143	0.0000
C	6.716128	15.22438	0.441143	0.6597

R-squared	0.442232	Mean dependent var	-3.818672
Adjusted R-squared	0.438656	SD dependent var	254.9245
SE of regression	190.9968	Akaike info criterion	13.35497

Sum squared resid	5690843.	Schwarz criterion	13.39373
Log likelihood	-1053.042	Hannan-Quinn criter.	13.37071
F-statistic	123.6861	Durbin-Watson stat	1.961586
Prob(F-statistic)	0.000000		

Null Hypothesis: D(DAX) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.82638	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DAX,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DAX(-1))	-0.857532	0.079208	-10.82638	0.0000
C	42.67530	28.96581	1.473299	0.1427

R-squared	0.429012	Mean dependent var	1.766521
Adjusted R-squared	0.425351	SD dependent var	476.1962
SE of regression	360.9833	Akaike info criterion	14.62812
Sum squared resid	20328196	Schwarz criterion	14.66688
Log likelihood	-1153.621	Hannan-Quinn criter.	14.64386
F-statistic	117.2105	Durbin-Watson stat	1.934528
Prob(F-statistic)	0.000000		

Null Hypothesis: D(DJIA) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.02388	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DJIA,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DJIA(-1))	-0.959248	0.079779	-12.02388	0.0000
C	57.28309	36.34434	1.576122	0.1170

R-squared	0.480992	Mean dependent var	-2.184614
Adjusted R-squared	0.477665	SD dependent var	626.2273
SE of regression	452.5915	Akaike info criterion	15.08043
Sum squared resid	31954894	Schwarz criterion	15.11920
Log likelihood	-1189.354	Hannan-Quinn criter.	15.09618
F-statistic	144.5736	Durbin-Watson stat	1.996124
Prob(F-statistic)	0.000000		

Null Hypothesis: D(FTSE_100) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-13.35921	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FTSE_100,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FTSE_100(-1))	-1.065549	0.079761	-13.35921	0.0000
C	17.40426	16.44214	1.058516	0.2915

R-squared	0.533588	Mean dependent var	-0.248101
Adjusted R-squared	0.530599	SD dependent var	300.6821
SE of regression	206.0060	Akaike info criterion	13.50626

Sum squared resid	6620399.	Schwarz criterion	13.54503
Log likelihood	-1064.995	Hannan-Quinn criter.	13.52201
F-statistic	178.4685	Durbin-Watson stat	2.001054
Prob(F-statistic)	0.000000		

Null Hypothesis: D(IBEX_35) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.86243	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IBEX_35,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IBEX_35(-1))	-0.865689	0.079696	-10.86243	0.0000
C	7.904466	43.71733	0.180809	0.8568

R-squared	0.430641	Mean dependent var	-9.428482
Adjusted R-squared	0.426991	SD dependent var	725.4577
SE of regression	549.1521	Akaike info criterion	15.46721
Sum squared resid	47044619	Schwarz criterion	15.50597
Log likelihood	-1219.909	Hannan-Quinn criter.	15.48295
F-statistic	117.9924	Durbin-Watson stat	1.953514
Prob(F-statistic)	0.000000		

Null Hypothesis: D(ISEQ) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.350333	0.0000
Test critical values: 1% level	-3.471987	
5% level	-2.879727	
10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ISEQ,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ISEQ(-1))	-0.746960	0.079886	-9.350333	0.0000
C	4.992841	21.45481	0.232714	0.8163

R-squared	0.359155	Mean dependent var	-7.132215
Adjusted R-squared	0.355047	SD dependent var	335.1928
SE of regression	269.1898	Akaike info criterion	14.04129
Sum squared resid	11304248	Schwarz criterion	14.08005
Log likelihood	-1107.262	Hannan-Quinn criter.	14.05703
F-statistic	87.42872	Durbin-Watson stat	1.999972
Prob(F-statistic)	0.000000		

Null Hypothesis: D(PSI_20) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.44838	0.0000
Test critical values:	1% level	-3.471987	
	5% level	-2.879727	
	10% level	-2.576546	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PSI_20,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PSI_20(-1))	-0.822894	0.078758	-10.44838	0.0000
C	0.148867	0.623371	0.238810	0.8116

R-squared	0.411695	Mean dependent var	-0.022478
Adjusted R-squared	0.407924	SD dependent var	10.17972
SE of regression	7.832935	Akaike info criterion	6.967129
Sum squared resid	9571.361	Schwarz criterion	7.005896
Log likelihood	548.4032	Hannan-Quinn criter.	6.982873
F-statistic	109.1686	Durbin-Watson stat	1.988780
Prob(F-statistic)	0.000000		

Null Hypothesis: D(SOFIX) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic – based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.209352	0.0000
Test critical values:	1% level	-3.472259	
	5% level	-2.879846	
	10% level	-2.576610	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SOFIX,2)
Method: Least Squares
Sample (adjusted): 3 160
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SOFIX(-1))	-0.597122	0.096165	-6.209352	0.0000
D(SOFIX(-1),2)	-0.192382	0.079047	-2.433759	0.0161
C	0.834511	5.089957	0.163952	0.8700

R-squared	0.393029	Mean dependent var	0.143631
Adjusted R-squared	0.385147	SD dependent var	81.31109
SE of regression	63.75812	Akaike info criterion	11.16699
Sum squared resid	626025.2	Schwarz criterion	11.22539
Log likelihood	-873.6090	Hannan-Quinn criter.	11.19071
F-statistic	49.85953	Durbin-Watson stat	2.056702
Prob(F-statistic)	0.000000		

Null Hypothesis: D(GEPU) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic – based on SIC, maxlag=15)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-13.71260	0.0000
Test critical values: 1% level	-3.455990	
5% level	-2.872720	
10% level	-2.572802	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GEPU_CURRENT,2)
Method: Least Squares
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEPU_CURRENT(-1))	-1.636623	0.119352	-13.71260	0.0000
D(GEPU_CURRENT(-1),2)	0.467962	0.091507	5.113953	0.0000
D(GEPU_CURRENT(-2),2)	0.270403	0.061102	4.425472	0.0000
C	0.634926	1.482016	0.428420	0.6687

R-squared	0.596807	Mean dependent r	0.015918
Adjusted R-squared	0.591969	SD dependent var	36.96355
SE of regression	23.61132	Akaike info criterion	9.176953
Sum squared resid	139373.7	Schwarz criterion	9.232659
Log likelihood	-1161.473	Hannan-Quinn criter.	9.199363
F-statistic	123.3502	Durbin-Watson stat	2.018057
Prob(F-statistic)	0.000000		

Null Hypothesis: D(VIX) has a unit root
Exogenous: Constant
Lag Length: 10 (Automatic – based on SIC, maxlag=31)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-30.39226	0.0000
Test critical values: 1% level	-3.431564	
5% level	-2.861961	
10% level	-2.567037	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(VIX,2)
Method: Least Squares
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(VIX(-1))	-0.1351 4.106350 12		-30.39226	0.0000
C	-0.0687 0.002948 96		-0.042848	0.9658

R-squared	0.771664	Mean dependent var	-0.000346
Adjusted R-squared	0.771126	SD dependent var	9.840622
SE of regression	4.707831	Akaike info criterion	5.938891
Sum squared resid	103526.5	Schwarz criterion	5.955423
Log likelihood	13893.91	Hannan-Quinn criter.	5.944705
F-statistic	1435.060	Durbin-Watson stat	2.001629
Prob(F-statistic)	0.000000		

Null Hypothesis: D(WIG) has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic – based on SIC, maxlag=22)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-13.82150	0.0000
Test critical values: 1% level	-3.435356	
5% level	-2.863638	
10% level	-2.567937	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(WIG,2)
Method: Least Squares
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(WIG(-1))	-0.750501	0.054300	-13.82150	0.0000
C	-0.000881	0.002703	-0.325891	0.7446

R-squared	0.388168	Mean dependent var	-2.55E-05
Adjusted R-squared	0.384728	S.D. dependent var	0.121964
SE of regression	0.095668	Akaike info criterion	-1.849506

Sum squared resid	11.39464	Schwarz criterion	-1.816732
Log likelihood	1166.716	Hannan-Quinn criter.	-1.837187
F-statistic	112.8387	Durbin-Watson stat	1.987898
Prob(F-statistic)	0.000000		

Null Hypothesis: D(BUX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic – based on SIC, maxlag=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-44.18478	0.0001
Test critical values:	1% level	-3.433781	
	5% level	-2.862942	
	10% level	-2.567563	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BUX,2)
Method: Least Squares
Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BUX(-1))	-1.044094	0.023630	-44.18478	0.0000
C	0.002487	0.001173	2.120753	0.0341

R-squared	0.520571	Mean dependent var	0.000125
Adjusted R-squared	0.520304	S.D. dependent var	0.071762
SE of regression	0.049703	Akaike info criterion	-3.164409
Sum squared resid	4.441686	Schwarz criterion	-3.158303
Log likelihood	2849.968	Hannan-Quinn criter.	-3.162155
F-statistic	1952.294	Durbin-Watson stat	1.980210
Prob(F-statistic)	0.000000		

Null Hypothesis: D(PX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic – based on SIC, maxlag=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-40.18088	0.0000
Test critical values:	1% level	-3.433667	
	5% level	-2.862891	
	10% level	-2.567536	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PX,2)

Method: Least Squares

Included observations: 158 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PX(-1))	-0.929718	0.023138	-40.18088	0.0000
C	6.50E-05	7.02E-05	0.925853	0.3546

R-squared	0.465073	Mean dependent var	-2.13E-06
Adjusted R-squared	0.464785	S.D. dependent var	0.004135
SE of regression	0.003025	Akaike info criterion	-8.762471
Sum squared resid	0.016997	Schwarz criterion	-8.756524
Log likelihood	8146.717	Hannan-Quinn criter.	-8.760279
F-statistic	1614.503	Durbin-Watson stat	2.004954
Prob(F-statistic)	0.000000		

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ASSESSMENT OF THE COVID-19 PANDEMIC IMPACT ON PEOPLE'S LIVES IN NORTH MACEDONIA[3]

Within the paper, an analysis of the situation in North Macedonia caused by the emergence of the new coronavirus (SARS-CoV2) was performed. The first part of the analysis is based on the official statistics in the country related to the occurrence of the infection and the intensity of its spread, number of infected cases, number of deaths, etc. The second part of the analysis is based on the results of our own survey conducted in order to obtain additional information to assess the impact of the pandemic on human lives in the country. The questionnaires used as an instrument for data collection were distributed electronically to the respondents (adult population). The data collection period was one week (from 15 to 21 May, 2020). The survey was responded by 313 participants. The survey results give us a more comprehensive picture about the situation in the country, referring to: the familiarity of the population with the coronavirus and with the potential health and economic implications from the virus; the impact of the new situation on the people's lives and on the daily habits; the pandemic impact on employment and income; the population risk perception regarding the COVID-19 infection and regarding their personal concerns about the uncertain future.
Keywords: COVID-19; survey; economic and social implications
JEL: D01; I18; J64

Introduction

The coronavirus pandemic has inflicted on the world the worst impact in the last hundred years, testing the resilience of modern societies, economies, health systems and welfare systems like never before.

The initial spark that marked the beginning of the health crisis was the first identified pneumonia case infected of unknown cause on November 18, 2019, in Wuhan, China. After this, on December 31, 2019, Chinese health authorities notified the World Health

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Organization (WHO) of a pneumonia cluster of unknown cause in Wuhan. On January 9, 2020, a new coronavirus was identified, for which genetic sequencing determined that it belonged to the beta-corona strain.[4]

The coronavirus epidemic that started in China quickly spread to Europe and the United States and affected many countries worldwide and a relatively large percentage of the world's population, gaining scale of a pandemic. At the end of January 2020, just over a month after the outbreak of the coronavirus in China, according to WHO data, 20 countries had reported cases of COVID-19 infected persons, in order to at the end of February 2020, the number of countries that have reported the existence of the virus to increase to 54 countries.

The COVID-19 pandemic, which was officially declared on March 11, 2020 by the WHO Secretary General, affected 213 countries worldwide by mid-May 2020. Although the infection has spread worldwide, it has not affected all countries equally. Among the hardest hit are the highly developed countries, led by the United States, Great Britain, Italy, Spain, Germany, France and Turkey, where the number of infected people, by country, reached more than 100.000 by May 2020.

As of May 20, 2020, in 213 countries worldwide, more than 5 million cases of infection have been registered and over 320 thousand deaths have been recorded as a result of the COVID-19 pandemic. After the reduction of restrictive measures in mid-2020, almost all countries reported a new growing wave of spread of infection and by the end of September the number of infected cases in the world reached 32 million, the number of recovered exceeded 22 million and the number of deaths exceeded 980.000 people.

The new strong (autumn) wave of spread of the infection by the end of November 2020 resulted in close to 62 million confirmed infected cases and almost 1.5 million deaths globally, and by the end of 2020 the total number of confirmed infected cases worldwide exceeded 80 million people (https://news.google.com/covid19/).

With the discovery of the severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) in late 2019 (Zhu et al. 2020) and very recently with the subsequent pandemic of COVID-19 (JHCRC 2020), society and economies worldwide are experiencing an unprecedented exogenous shock (GDA 2020). Although the occurrence of a pandemic caused by a new virus is unsurprising for virologists, the infection control measures such a social distancing (Glass et al. 2006) taken to slow the spread of COVID-19 exert tremendous pressure on large parts of the national economies.

The countries efforts to slow the spread of the virus and to save human health have resulted in the closure of numerous economic activities. The need to maintain social and physical

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[4] Coronaviruses (CoV) are a large family of viruses that cause diseases ranging from the common cold to more severe diseases (SARS-CoV, MERS-CoV). The coronavirus (SARS-CoV2) is a new type of coronavirus that has not been previously identified in humans and causes a disease called COVID-19. Common symptoms and signs of infection include fever, cough, and difficulty breathing. In more severe cases, the infection can cause pneumonia, severe acute respiratory syndrome, renal failure and even death. There is no specific treatment, similar to most viruses. However, many of the symptoms can be treated and therefore treatment should be based on the patient's clinical condition (http://zdravstvo.gov.mk/wp-content/uploads/2020/03/info-COVID-19-22.03.pdf).

distance, quarantines, self-isolation of people, job restrictions, severance of trade ties and isolation of countries have contributed to the closure of entire economic sectors, especially the hospitality and tourism sectors, parts of the transport sector, trade and processing industry, as well as education, culture, sports, etc.

All this contributed the new crisis caused by the COVID-19 pandemic, which initially appeared as a health crisis, quickly to grow into an economic and social crisis.

1. Overview of the Situation in North Macedonia Related To the COVID-19 Pandemic

North Macedonia is one of the countries where people infected with the COVID-19 virus are registered, and according to the number of infected cases per 100.000 inhabitants and the number of deaths per 100.000 inhabitants, it belongs among the severely affected countries by the COVID-19 pandemic, with the widespread transmission in the community.

COVID-19 infection that was rapidly spread from China to Europe, to the United States and to the other parts of the world, in a short time was transmitted to North Macedonia, where the first positive case of COVID-19 (zero patient) was reported on February 26, 2020. The quick reaction of the health authorities and the numerous lockdown measures taken as a response to the spread of the new coronavirus, such as: interruption of the educational process, prohibition of mass public events and prohibition of travel to high-risk countries, recommendations for work from home, closure of all cinemas, theatres, playgrounds and museums, closure of all sports facilities and complete ban on the operation of catering facilities, closure of the two airports in the country, except for state, military, humanitarian, hospital and cargo flights, etc., enabled the situation in the country to be kept under control in the first few months after the start of the pandemic. Namely, in March 2020, the number of newly infected cases remained low and did not exceed 50 infected persons on a daily basis, and in April 2020 the peak was reached on April 16, recording 107 new cases in 24 hours, after which the number of newly infected persons by the end of May remained low.

The reduction of the infection control measures just before the summer period, on the other hand, resulted in an increase in the number of infected people on a daily basis and its maintenance in triple digits in the summer months. During June, the largest number of newly infected persons on a daily basis was registered on June 5 (179 persons) and on June 17 (194 persons). In July, a total of 4.424 confirmed cases (or 206,7 cases per 100.000 inhabitants) and 179 deaths of COVID-19 were reported on the territory of North Macedonia, compared to a similar number of 4.144 infected people with 178 deaths in the previous month – June 2020. The course of the pandemic in North Macedonia, from its beginning until July 31, 2020, resulted in a total of 10.883 reported cases of COVID-19, i.e. 526,5 cases per 100.000 inhabitants (http://www.iph.mk/wp-content/uploads/2020/09/BILTEN-7_2020.pdf).

During August and September, there has been registered some decline in the number of infected people on a daily basis, while the number of new cases amounted 3.561 persons in August and 3.689 persons in September 2020. According to the official data of the Institute of Public Health, as of September 30, 2020, in North Macedonia, a total of 18.133 cases of

COVID-19 or 876,3 persons per 100.000 inhabitants were reported (http://iph.mk/wp-content/uploads/2020/11/BILTEN-9_2020.pdf).

The situation with the spread of COVID-19 infection has been significantly worsened in mid-October 2020, when the number of new confirmed cases on a daily basis in some days was greater than 500 people, and the pandemic reached its peak on October 30, 2020, when 1.085 people positive on COVID-19 were officially registered in one day. According to official data, in October 2020, a total of 32.489 cases of COVID-19 were reported on the territory of North Macedonia, which indicates a number of 1.570,1 infected persons per 100.000 inhabitants and 1.011 deaths. These dynamics of the spread of the virus continued in the next two months of 2020, and in the first month of 2021 there was an evidently slower pace of transmission of the infection. In November, a record number of confirmed new cases per day were recorded on November 17 (1.406 persons), which is actually the highest number of reported cases during the pandemic on a daily basis. According to the data of the Institute of Public Health, as of January 24, 2021, a total of 90.717 cases of COVID-19 or 4.384,2 cases per 100.000 inhabitants have been reported in the country (https://www.iph.mk/sostojba-so-covid19-od-18-do-24-1-2021/).

Analyzed by cities, the highest cumulative incidence per 100.000 inhabitants, in the period until January 24, 2021, was registered in Stip with 6.599,2 confirmed cases per 100.000 inhabitants, Skopje (6.389,1/100.000), Kavadarci (5.744,3/100.000) and Sveti Nikole (5.201,8/100.000), and the lowest incidence with 2.098,9 confirmed cases per 100.000 inhabitants was registered in Krusevo (IPH 2021).

Regarding the distribution of the infection by gender, 46.237 males and 44.480 females positive on COVID-19 were registered. The specific morbidity in males is 4.460,8 persons per 100.000 inhabitants, and in females 4.307,31 persons per 100.000 inhabitants.

The age of the patients, on the other hand, ranges from 0 to 101 years (average – 45.4 years). Most patients – 21.323 persons are over 60 years of age (23.5%) with an incidence of 5.563,2 persons per 100.000 inhabitants, and the highest specific incidence of 5.979,1 persons per 100.000 inhabitants is registered in the age group of 50-59 years (16.625 patients). The lowest incidence of 786,9 persons and 1.540,7 persons per 100.000 inhabitants was registered in children aged 0-9 and 10-19 years, where 1.801 and 3.855 cases were reported respectively (IPH 2021).

Table 1

COVID-19 statistics for selected countries in the Region

Country	Total confirmed cases	Confirmed cases per 100.000 inhabitants	Total deaths	Deaths per 100.000 inhabitants
Bulgaria	211.813	3.040,3	8.483	121,8
Croatia	225.128	5.325,0	4.655	110,1
Kosovo	55.808	2.887,5	1.400	72,4
Montenegro	55.561	9.110,5	745	122,2
North Macedonia	**89.025**	**4.273,2**	**2.702**	**130,3**
Serbia	372.533	5.312,7	3.750	53,3

Source: https://www.worldometers.info/coronavirus/ and https://covid.cdc.gov/covid-data-tracker/ and authors' calculations.

In Table 1 is presented data on COVID-19 infected persons in total and per 100.000 inhabitants and deaths in total and per 100.000 inhabitants, for selected countries in the Region, as of January 16, 2021.

According to the analyzed data, shown in Table 1, North Macedonia among the selected countries has fewer cases per 100.000 inhabitants from Croatia, Montenegro and Serbia, and more than Bulgaria and Kosovo, but according to the number of deaths per 100.000 inhabitants, the country is at the top of the list.

2. Impact of COVID-19 Pandemic on the People's Lives in North Macedonia

The COVID-19 pandemic, which affects every possible sphere of human life, has completely changed the world, starting with the way we live, communicate, move, perform work responsibilities, travel, etc., and the implications of the virus are evident in the economic, social, health, education systems. In January 2021, almost 11 months after the start of the pandemic, the whole world is still in uncertainty, and the questions to which experts from various fields still can not give a correct answer are: How long will the pandemic last? Does the vaccine, which is available in several variants in the world today, will give the desired results? What will people's lives be like after the end of the pandemic? Is it possible for life in the future to be the same as before?

In North Macedonia, as one of the highly affected countries with the COVID-19 pandemic, there is a relatively good base of statistical data and information on the number of infected people, active cases, hospitalized persons etc. However, the analyzes in this area pointed to the need for additional data that would serve as a basis for conducting research in order to assess the impact of the pandemic on human lives in the country.

Regarding this need, the Center for Strategic Research "Ksente Bogoev" of MANU conducted a survey to provide additional data and information, in addition to officially available, which will serve as a basis for conducting analysis and research in order to assess the impact of the pandemic on the people's lives in the country. The survey, conducted electronically (online), in the period 15-21 May 2020, is completely anonymous and covers a sample of 313 adult respondents.

2.1. Structure of the survey

The survey consists of 25 questions, divided into several areas.

First, the survey begins with the collection of basic demographic data, such as age, gender and level of education. Then the survey consists of questions that provide information about *family status*, number of members and the number of minors in the household.

Awareness of COVID-19 effects on the health and the *infection protect measures* taken by the population during the pandemic are very important for the protection of human health. Because of that, questions related to these aspects are included in the survey.

In order to measure the *economic implications* of the pandemic on the population, the subject of analysis in the survey are the changes in household income and savings as a result of the occurrence of COVID-19. Additionally, for measuring the economic implications on the population, in the survey are included questions that provide data related to the implications on the workplace as a result of the pandemic, changes in the way work activities are performed and the perceptions of the population for the future changes in the workplace.

Keeping in mind the fact that people's lives have changed significantly, people's perceptions and attitudes are very important for the future course of activities and a return to normal life, one part of the survey is dedicated to these future *attitudes and perceptions.*

2.2. Results of the survey

According to **gender**, more than half, or 64.2% of the respondents are women, and 35.8% are men, while according to **age**, most of the respondents (41.5%) are aged 26-35 years, and the lowest share in the research, of only 6%, has the population aged over 65 years (Figure 1).

Figure 1
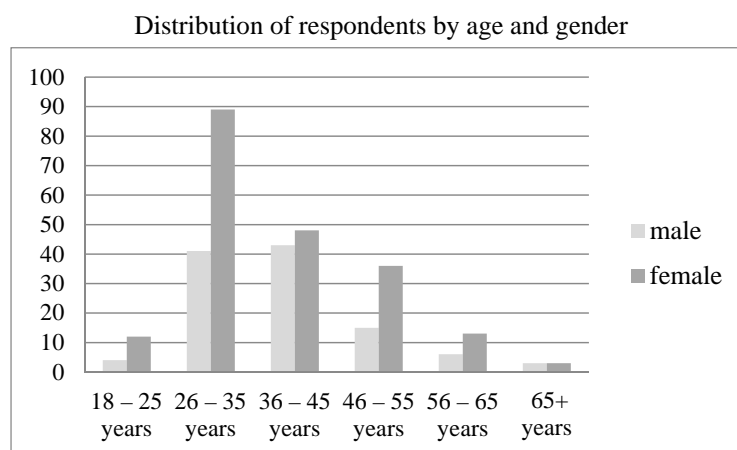
Distribution of respondents by age and gender

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

According to the **level of education**, the most of the respondents have tertiary education (54%), followed by respondents with master's degree (23.6%) and respondents with secondary education (15%). The smallest part of the respondents are doctors of science (7.3%).

Furthermore, the analyzed data, presented in Figure 2, show that most of the respondents, i.e. 32% and 29%, live in four-person and three-person households, respectively. About 20% of respondents live in households with more than four persons, 16% live in two-person households, and only 3% of respondents live alone. Almost half or 45.7% of the respondents have household's members under the age of 18.
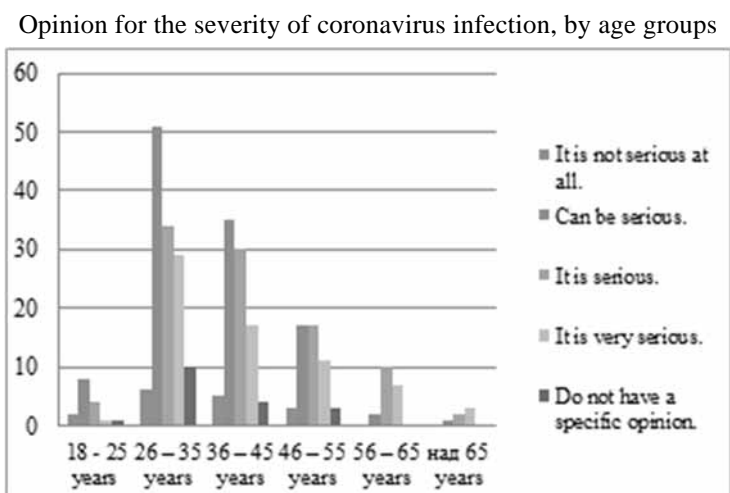
Figure 2
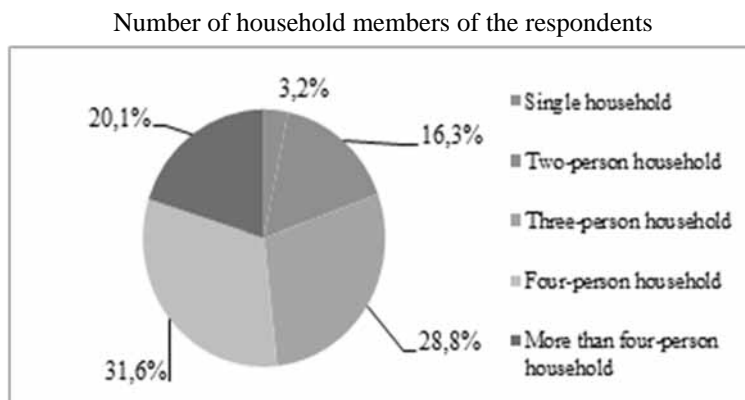
Number of household members of the respondents

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

Primarily, the results of the survey indicate a **high degree of awareness and familiarity** of the population with the coronavirus and its potential health and economic implications, i.e. over 90% of respondents are familiar, 7% are partially familiar, and only 0.3% are not familiar at all. The most common sources of information provided by the respondents are official press conferences, social media and websites.

Regarding the **severity of coronavirus infection,** 36.4% of the respondents think that the infection can be serious, 31% that it is serious, and 21.7% that it is very serious. For 5.1% of the respondents, infection with COVID-19 is not serious at all, while 5.8% of the respondents do not have a specific opinion on this issue. The opinion of the respondents on the severity of coronavirus infection, by age groups, is shown in Figure 3.

Figure 3

Opinion for the severity of coronavirus infection, by age groups

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

The most common **protection measures against the coronavirus**, the respondents cite: frequent hand washing (86.6%), wearing a protective mask and/or protective gloves (81.2%), maintaining social distance and reducing exits from home (69.6%) and maintaining physical distance in contacts with other people (67.7%).[5]

The consequences of the COVID-19 pandemic are inevitably linked to their **effects on the economic life of the population, changes in jobs and the way work activities are carried out.**

In terms of the sample structure by employment sector (public or private), the majority, or 43.7% of the respondents, are employed in the public sector, followed by respondents employed in the private sector (39.3%) and entrepreneurs, who are self-employed and/or employ other persons (4.5%). The rest of the respondents are unemployed (5.4%), students (3.8%) and retirees (3.2%).

Related to the issue **of jobs changing as a result of the pandemic**, more than half or 53% of respondents kept their jobs and continued to work from their existing workplace, 30.7% of respondents continued to work from home, 3.2% of the respondents lost their jobs during the pandemic and now are unemployed, while 2 respondents (0.6%) lost their jobs and started a new job during the pandemic. The rest of the respondents (12.5%) fall into the category of unemployed before the crisis, students and retirees.

The analysis related to the **respondents' fear and uncertainty about their job** shows that 55% of the respondents do not fear for the job at all, 25% of the respondents often think about it and 5% of the respondents are very afraid of losing their job. The analysis additionally shows significantly higher uncertainty and fear for job losing among employees in the private sector, i.e. out of 78 respondents who are afraid for their jobs, or over 75% of them are employed in the private sector.

Regarding **family income**, in the analyzed period, for 49.8% of the respondents, the income did not change. Reduction of income is evident for 45.7% of the respondents and an increase of income are reported by 3.2% of respondents. 1.3% of the respondents experienced a complete loss of income as a result of the pandemic (Figure 4).

Additionally, the analysis shows that almost 60% of respondents who reported that their family income had decreased as a result of the pandemic were employed in the private sector. This data indicates a significantly higher vulnerability of private-sector employees during the crisis.

Furthermore, the survey results show that **most of the family income** during the pandemic, 82.4% of respondents have spent on food, 16.6% of respondents on disinfectants, and only about 1% of respondents most of the income they have spent on clothes and luxury goods.

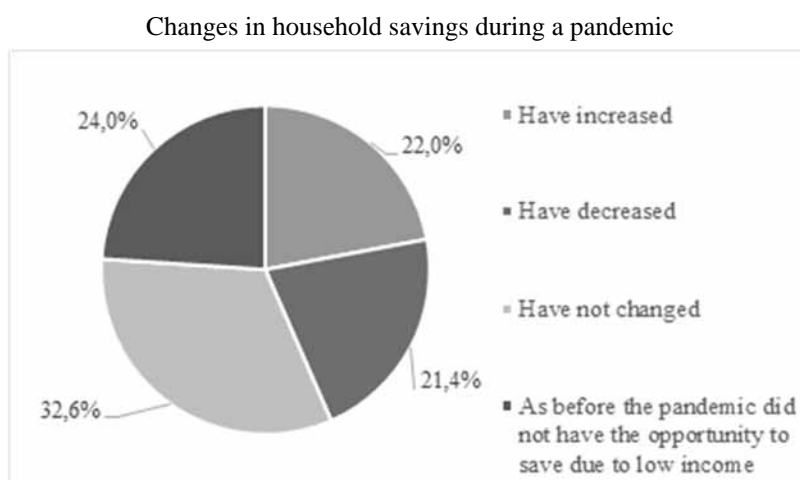[5] The question is with multiple choice answers.

Figure 4
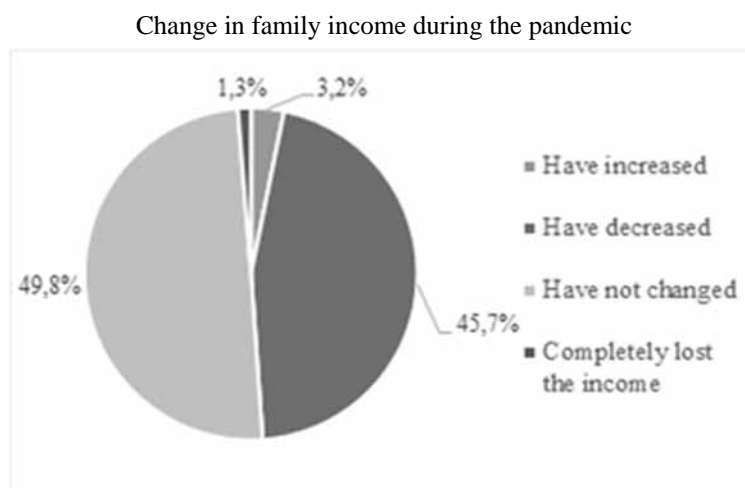
Change in family income during the pandemic

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

Regarding the changes in **savings** during the pandemic, 32.6% of the respondents did not experience any changes in savings, i.e. they continued to save as before. 22% of the respondents stated that their savings have increased, 21.4% of the respondents stated that their savings had decreased, while 24% of the respondents stated that during the pandemic, as before, they did not have the opportunity to save due to low income (Figure 5).

Figure 5

Changes in household savings during a pandemic

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

The new situation without a doubt had a significant impact on **people's daily habits**. In the context of lifestyle habits, the survey covers aspects related to the online shopping habits and

aspects related to dietary habits of the population during the pandemic. The results show that 17% of respondents are buying online more than before. Regarding the dietary habits, certain changes are also evident, i.e. about 25% of the respondents stated that during the pandemic, they are eating healthier, i.e. that they are consuming more fruits, vegetables and vitamins.

The emergence of global pandemics, such as the COVID-19 pandemic, can have an as high impact on the future of humans as the impact of the global economic crises or wars. The behaviour of the population today is closely related to their perceptions and views on the future. **The population risk perception regarding the COVID-19 infection and regarding their personal concerns about the uncertain future** is presented below. More than half of the respondents (57.8%), in May 2020, are optimistic about the future and believe that the situation caused by the new coronavirus will be overcome in the near future. 17.6% of respondents are pessimistic about the future, and their fear is accompanied by the belief and perception that the situation will not be improved in the near future, it will be even worse, while 24.6% of respondents do not have a specific opinion on this issue.

According to the **age groups**, shown in Figure 6, the most optimistic views about the future are observed among the respondents aged 18-25 and among the respondents aged 46-55. In these age groups, 75% or 70.6% of the respondents, respectively, believe that the situation caused by the coronavirus will be overcome in the near future. Pessimistic views about the future, on the other hand, are predominant among respondents aged 56-65 (36.8%) and respondents aged 36-45 (18.7%). About one third, i.e. 33.3% of the respondents over 65 years of age and 33% of the respondents at 36-45 years of age, do not have a specific opinion for the future.

Figure 6
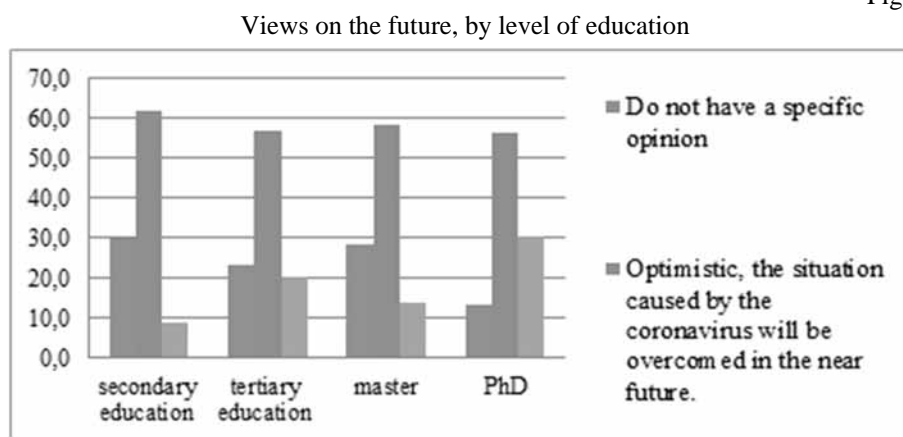
Views on the future, by age group
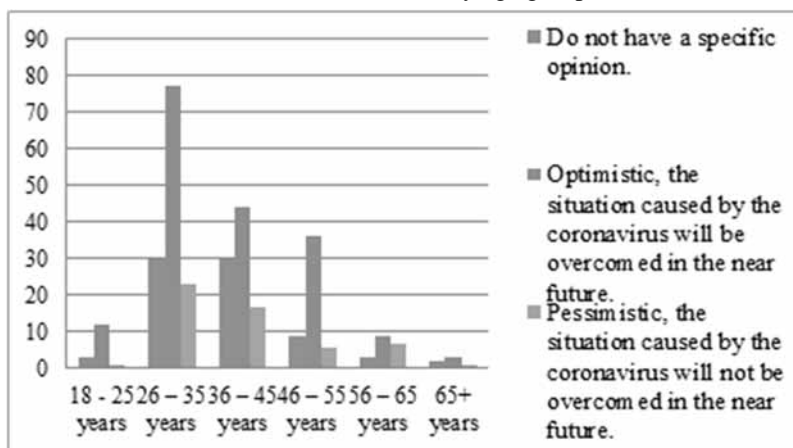
Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

The personal conserns about the uncertain future, analyzed in terms of the **level of education** of the respondents are shown in Figure 7.

Figure 7

Views on the future, by level of education

Source: Results from the survey conducted by the Center for Strategic Research "Ksente Bogoev" of MANU.

Related to this issue, the data according to which the optimistic views on the future are dominant are almost equally represented in the answers of the respondents from all groups according to the level of education, i.e. over 55% of the respondents from different groups according to education (secondary education – 61.7%, tertiary education – 56.8%, masters – 58.1% and doctors of science – 56.5%) have optimistic views for the future.

The analysis of the survey results shows that the most pessimistic perceptions of the situation in the near future have doctors of science. Of the total number of PhDs respondents included in the research (23 people), one third or 30.4% have pessimistic views about the future, as opposed to, for example, respondents with secondary education (47 people), of which only 8.5% have pessimistic views of the future.

Conclusion

There is no doubt that the COVID-19 pandemic has significantly changed the human lives around the world. In the world, as well as in North Macedonia, despite the fact that there are available statistics regarding the number of infected people, active cases, new cases, recovered and deaths as a result of the coronavirus, however, there are a lack of data on personal experience of individuals and people's lives during the pandemic, expressed through changes in daily people habits, financial and job implications, population risk perception and personals concerns about the future and so on. Keeping in mind this need, the Center for Strategic Research "Ksente Bogoev" of the Macedonian Academy of Sciences and Arts conducted a survey which one is analyzed within the paper. The summary results of the survey indicate the following findings and conclusions:

- The survey was answered by a total of 313 respondents, of which 64.2% (N = 201) are women and 35.8% (N = 112) are men. In terms of age, most of the respondents are between 26 and 35 years of age (41.5%), and according to the level of education, more

than half of the respondents are with completed tertiary education. Almost one-third of the respondents live in four-person households, while almost half of the respondents, i.e. 45.7% in the household, have persons younger than 18 years.

- The survey data indicate a high level of familiarity of the population with the coronavirus and the potential health and economic implications of the virus, i.e. over 90% of respondents are familiar, 7% are partially familiar and only 0.3% are not at all familiar with the virus. For the respondents, official press conferences, social media and websites are the most common sources of information. Almost 90% of respondents believe in the seriousness of coronavirus infection, and the most common measures taken by respondents to protect themselves from coronavirus infection are: frequent hand washing, wearing a protective mask and protective gloves, maintaining social distance and maintaining a physical distance.

- The COVID-19 pandemic has obvious implications on the financial status of the population, changes in their jobs and the way their jobs are performed. Most of the respondents are employed in the public sector (43.7%) followed by employees in the private sector (39.3%), while only 4.5% of the respondents are entrepreneurs, i.e. are self-employed and/or employ other persons. The rest of the respondents are unemployed, retired and students. Regarding the changes in the jobs and the way of performing the jobs as a result of the pandemic, more than half of the respondents or 53% kept their jobs and continued to work from the existing workplace, while 30% of the respondents continued to work from home. 3.2% of the respondents lost their jobs during the pandemic, and 0.6% lost their jobs, but have started a new job again.

- One of the economic implications of the pandemic is the emergence of job uncertainty. More than half of the respondents (55%) are not afraid of losing their job at all, 25% of the respondents often think about this threat, while 5% of the respondents are afraid of the great risk and uncertainty that they may lose their job as a result of the pandemic. The majority of the respondents who are afraid for their jobs or over 75% are employed in the private sector, which means that the uncertainty regarding jobs is significantly higher among employees in the private sector.

- Regarding the change in family income, almost half of the respondents (49.8%) have reported that the family income as a result of the pandemic did not change, while 45.7% of the respondents have reported that the family income has decreased. 3.2% of the respondents reported an increase in income, while 1.3% had completely lost their income as a result of the pandemic. The results of the survey show that about 60% of the respondents who reported that their family income has decreased as a result of the pandemic are employed in the private sector.

- Regarding the changes in household savings as a result of the pandemic, for almost one-third of the respondents, there were no changes in savings, and for 22%, the savings increased. Savings during the pandemic decreased for 21.4% of respondents, while 24% of respondents said that during the pandemic, as in the period before, they did not have the opportunity to save due to low income.

- The new situation has significantly affected people's daily life habits. In the context of lifestyle habits, the survey covers aspects related to the online shopping habits and aspects related to dietary habits during the pandemic. The results show that 17% of respondents buy online more frequently than before. Regarding the dietary habits, some changes are also evident – 25% of the respondents stated that during the pandemic, they are eating healthier, i.e. that they are consuming more fruits, vegetables and vitamins.

- The great changes caused by the emergence of COVID-19 led to a significant increase in uncertainty about the future. Regarding the people's risk perception and their expectations about the future, more than half of the respondents have optimistic views on the future, i.e. they believe that the situation caused by the coronavirus will be overcome in the near future, while the rest of the respondents have pessimistic views on the future or do not have a specific opinion on this question. According to the **age groups,** the most optimistic views about the future are observed among the respondents aged 18-25 years and the respondents aged 46-55 years, while the pessimistic views about the future are predominantly among the respondents aged 56-65 years and in respondents aged 36-45 years. From the aspect of **the degree of completed education**, it is interesting that in the analyzed period, the most pessimistic perceptions for improving the situation in the near future had the doctors of science.

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MEASURES TO MITIGATE RISKS FOR VIETNAMESE ENTERPRISES EXPORTING GOODS TO ASEAN MARKETS[6]

With the advantage of being an economically dynamic and geographically close region, Vietnam – ASEAN trade relations have had high growth rates in recent decades. This has helped open new opportunities for Vietnamese exporters to get access to and expand its markets internally in a region of about 625 million population and larger external markets, as well as to get deeper engagement in the global value chain. However, the export of Vietnamese goods to these countries is always unpredictable and highly risky. Potential risks come from the policy of the states, from the parties and exporters involved, from the protection of domestic trade, from the customs and practices of the consumers. This has been especially true since the ASEAN Economic Community is officially established by the end of 2015. Risk identification is an important step to minimize and prevent risk and vulnerability in export activities for Vietnamese exporters while integrating into the region. By using a systematic, multi-dimensional approach, the paper uses a combination of quantitative and qualitative research methodologies to identify the risks for Vietnamese exports to the ASEAN market, which is based on data of export status and studies about the actual situation of exporters. At the same time, on the basis of the development orientation between Vietnam and AEC, the article is to provide solutions to reduce risks that are applicable for the state and industrial communities, thereby improving the efficiency of Vietnamese exports to the ASEAN markets.
Keywords: Vietnam; ASEAN; export; import; measures; risk; mitigate; trade
JEL: O01

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Introduction

In business activities, especially import-export business, there are always more varied and complicated risks. Although ASEAN is a relatively easy market, the income of ASEAN countries is also relatively low (except Singapore and Brunei). Standards and quality requirements of export goods to the region are not strict. However, Vietnamese goods continue to encounter many risks and disadvantages while entering the ASEAN markets. Current studies have not referred to the fact that Vietnamese exporters need to identify risks, handle risks as well as provide solutions to overcome these risks when exporting goods to ASEAN markets.

By research methods such as analysis, comparison and descriptive statistics based on published data of the General Statistics Office of Vietnam (secondary data) and in-depth interviews with experts and researchers (preliminary data) on risks and exports of Vietnamese goods to ASEAN, the paper focuses on clarifying the characteristics of ASEAN import markets; assess the current risk situation for Vietnam's exports to this market in recent years; On that basis, the paper proposes solutions to minimize risks for Vietnam's exports to ASEAN in the coming years.

Literature Review

In the study of SIDF (2004) (Saudi Industrial Development Fund), it is shown that exporters must take the initiative in taking risk preventive measures because if risks occur, it will directly affect the exporters' revenue. Transactions conducted with foreign partners further increase the complexity of each type of risk. SIDF defines risk management as a process in which each step must be clearly defined and implemented in sequence, building a deep awareness of the risks and their impacts on the exporters. The study also affirms that exporters must be accountable for the effects and risks of each export decision in their risk management strategy. Risk management is basically a combination of three steps: risk assessment, risk control and risk monitoring.

M. Christopher, N. Thorsten and W. Michael (2008) concluded that political risks are also a major obstacle in the export process, so they should be considered in the risk identification models in the export process, thereby identifying the appropriate solutions.

Chuck Hsiao, Richard Malak, Irem Y. Tumer, Toni Doolen (2013) demonstrate that when exporters do not manage risks properly, it will lead to excessive cost, wasted manpower and effort, and even heavy damages. The current risks are mainly technical risks, but exporters also need to consider risks stemming from human resources and opportunity costs. Therefore, managers need to develop a model to combine different types of risks in the project, especially the relationship among those risks.

Ralph, L., Christian, H. and Rico, B. (2013) point out 5 steps in the export risk management, in which: (i) the importance of an export project for exporters are clearly defined; (ii) analysis related to the expected gains and losses is made; (iii) possible risk "matrices" while exporting

are identified; (iv) risk preventive measures and (v) potential risks arising in the export process are monitored and adjusted.

Paolo and Vahid (2016) are of the view that enterprise management, especially risk management, affects exportability, creates a supportive framework for business to minimize risks related to exports and a safe platform for exporters to upgrade their position in the commercial world. This study mainly uses secondary data collected in the United States and the European Union (EU) to analyze specific risks, from issues of money laundering, dual-use risk, thereby analyze the risk management procedure. The authors conclude that to ensure export safety, organizations need to comply with export regulations. In the United States, there are offices of the State Department and the Ministry of Finance that provide comprehensive information on export compliance and control, at the same time, warn exporters of the consequences of non-compliance. In the EU, the European Institute for Export Compliance (EIFEC) is also an organization providing export risk consultancies. In order to minimize and control risks leading to losses or sanctions, exporters must develop a framework to identify partners and the risks associated with export compliance. Finally, every enterprise needs to develop a penalty and sanctions framework for failing to comply with the established regulations.

Several studies in Vietnam have dealt with the theme of risk mitigation in export. The doctoral thesis by Duong Van Hung (2010), titled *Promoting Export of Vietnam's footwear enterprises in Hanoi to EU market,* focused on measures to promote exports to the European Union (EU) market of footwear enterprises in Hanoi area. In particular, the author emphasized that enterprises in Hanoi initially had the advantage in finding sources of information, which helped them *measure* possible risks in the EU market. However, in the context that the EU imposed anti-dumping duties on footwear, enterprises need to *analyze* technical barriers, apply product quality management standards and strict environmental management to adapt to the technical barriers.

Le Quang Thang (2015), in his research on the *Export of Vietnamese goods to the Middle East market, impact and policy implications,* focuses on factors affecting Vietnam's exports to the Middle East. The study is based on the theory of factors affecting exports of one country, from the point of view of the exporting and exported countries as well as international factors. The author is of the view that the impact factors will produce both positive and negative effects and that measures to promote export should be based on the negative effects and the hindering factors. This research approach is relatively consistent with the model of risk mitigation research, which focuses on measuring, analyzing and predicting risks that may occur, based on hindering factors causing risks in the process of exporting goods.

Another study by a Vietnamese author to be mentioned here is *Factors affecting Vietnam's processed goods exports to the European Union market* by Vu Thi Mai Anh (2019). This research pointed out the positive and negative factors affecting the processed goods of Vietnam to the EU market. Particularly, the study added some new impact factors such as institutional gap, technological gap, macro-economic environment, trade liberalization, tariffs, human capital, technological innovation capacity. Especially, the study uses the

Technical Efficiency index (TE) to determine the prospect of exporting Vietnamese's processed goods to EU market.

Characteristics of ASEAN Import Markets

Formally joining ASEAN in 1995 is an important step in the process of Vietnam's open door and integration. Vietnam has actively and proactively engaged in ASEAN economic integration. Vietnam has taken advantage of its geographic proximity, its dynamic development and the large size of its population to make ASEAN a leading trade partner of Vietnam.

The export structure of Vietnam to ASEAN is changing positively both in quality and value. The average growth rate of Vietnam to ASEAN reached 17.1% over the years, bringing the export turnover from nearly $1 billion in 1995 to $18.3 billion in 2015 (more than 18 times) (Ministry of Industry and Trade 2016). After being formed in late 2015, AEC has basically become a common market, a unified production space. In particular, it helps create a single market that can exploit the optimal free trade preferences (FTA). Tariffs on goods flowing between countries in the region are to be gradually reduced to 0%. Vietnamese exporters have opportunities to penetrate into ASEAN markets. By 2017, ASEAN was Vietnam's fourth largest export market with a total export turnover of $21.51 billion, second only to the European Union (EU), the United States and China (General Department of Customs 2018) (Figure 1).

Figure 1

Vietnam – ASEAN Trade turnover of goods during the period 1996-2019 (Billion USD)
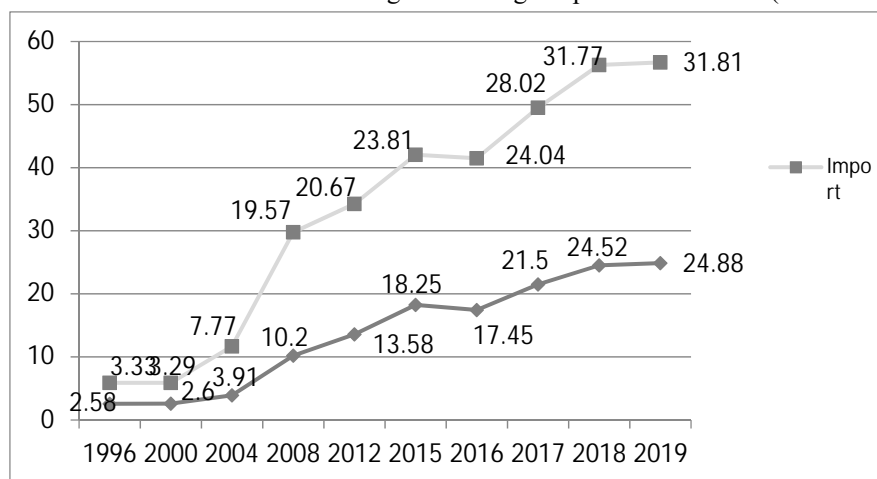
Source: Vietnam General Department of Customs, https://www.customs.gov.vn.

Among the Southeast Asian countries, Thailand is Vietnam's largest export market in 2017 with Vietnam's export turnover to this market reaching $4.8 billion; followed by Malaysian

market at $4.2 billion; Singapore at $3 billion and Phillippines at $2.8 billion (Ministry of Industry and Trade 2017).

The export structure of Vietnam to ASEAN has been changing in a positive way, both in terms of quality and value. From the traditional items that Vietnam has an advantage, including primary agricultural products and raw materials such as rice, coffee, rubber, crude oil with low processing content, over time, Vietnam has started to export many items of consumer and industrial goods such as computer components, textiles, processed agricultural products with high value and stability. Currently, the major export items of Vietnam to ASEAN include agricultural products (rice), telephones and spare parts; computers, electronic products and equipments; textiles, crude oil, etc. (Ministry of Industry and Trade 2013). Among these items, telephone and spare parts, computers, electronic products and components; textiles, fisheries contributed more than 45% of the value of exports to ASEAN in 2017.

Figure 2

Vietnam's exports to ASEAN by Commodities during the period 2013-2017 (million USD)
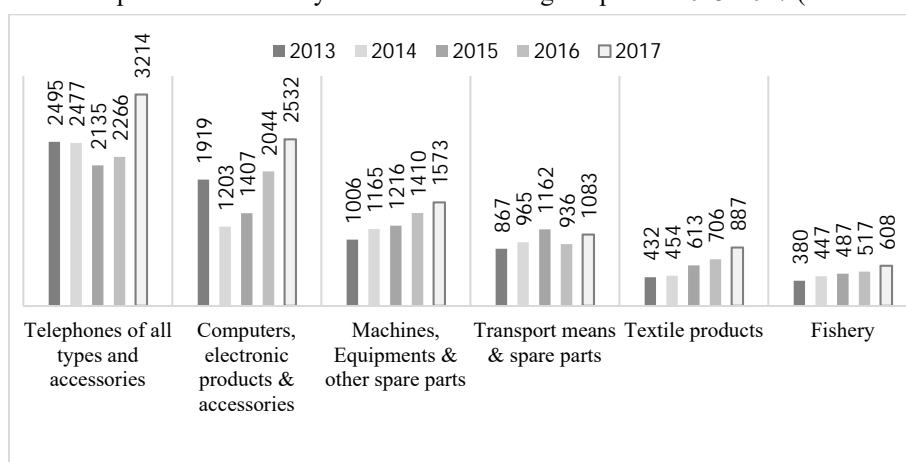
Source: Customs Statistics Yearbook on Vietnam import-export goods through the years & Vietnam General Department of Customs, https://www.customs.gov.vn

After the commitments to AEC came into effect, many economists were optimistic for Vietnam's exports as the business would benefit from positive factors by eliminating tariff barriers and reducing non-tariff barriers (Pham Viet Dung, 2016, p. 28). In addition, the Economic Community aims at creating a single common market and a unified production base, including the free movement of goods, creating opportunities for those Vietnamese goods that have advantages and are suitable for ASEAN markets. Trade agreements of ASEAN Economic Community such as AITIGA, which stipulates 98% of goods will be subject to tax at 0% by 2018. Up to now, in terms of trade cooperation with other countries in the ASEAN region, Vietnam has completed the tax elimination roadmap, so Vietnamese exporters have golden opportunities for exporting and expanding markets. Vietnam can also benefit from free trade agreements with external partners of ASEAN such as India, China, Australia, New Zealand.

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However, ASEAN is also a market with great competitive pressure. When ASEAN countries abolish tariff barriers, they also set up a system of technical standards to protect their domestic markets and restrict the export of other countries. Tariffs of many commodities are cut, but trade barriers may be tightened as free trade agreements give rise to non-trade barriers in the name of trade protection remedies. In particular, rules of origin play a particularly important role. In order to be able to export to ASEAN countries and enjoy tax incentives, exporters must prove the origin of goods at a rate specified for each item. The similarity of some products such as textiles, agricultural products, and fisheries of Vietnam and ASEAN countries also poses a big challenge for Vietnamese exporters.

In addition, the similarity of main items of AEC members such as textiles, rice, and fertilizer… creates a lot of competitive pressure. All members of the bloc produce consumer goods that are competitive with each other, so when the linking process occurs too quickly, it may lead to losing the advantage when it is forced to compete with each other. It can be said that these are also major risks for Vietnamese exporters in the ASEAN market.

Current Risk Situation of Vietnam Export Goods to ASEAN Market

The causes of the risks in exports are determined from both the sides of the exporting and the importing countries. With the establishment of AEC, the tariff on many items have been cut, but the risks are still coming from the rules of origin, technical standards, food safety and the Covid-19 pandemic.

The rules of origin have had a negative impact on the export situation of Vietnamese exporters into the ASEAN market. The rules of origin require at least 40% of the products produced originating in ASEAN to enjoy the tax rate of 0%. Many Vietnamese exporters find it difficult to meet the regulations because of the source of raw materials. At present, only about 20% of Vietnamese products meet the standards of the rules of origin (Tran Van Hung et al., 2015).

This, in turn, poses a risk to Vietnamese exporters. While exporting to ASEAN markets, Vietnamese exporters do not enjoy preferential tariffs, causing them to bear considerable costs incurred in the process of production and export, leading to high selling prices and disadvantages compared to other countries.

By 2017, Vietnam's National Single Window mechanism (NSW) has successfully linked with 4/10 ASEAN countries (Indonesia, Malaysia, Thailand, Singapore) to exchange the Certificate of Origin Form D for export goods originating from ASEAN (or ATIGA Certificate of Origin (C/O) form D). The National Single Window (NSW) allows customs declarants to submit electronic information and documents for customs clearance and the procedures of state management agencies in relation to the import and export goods through an integrated information system. State management agencies shall decide to allow goods to be imported, exported or transitted; the customs office decides to clear the goods, release the goods by the integrated information system. In addition, the mechanism for exchanging information on ATIGA C/O form D has officially operated as the Protocol on the legal framework for the implementation of the ASEAN Single Window has officially come into force. ASEAN Single Window (ASW) is an environment in which national single window

mechanisms work and integrate with each other. The implementation of the ASEAN Single Window derives from the need to create favourable trade conditions for ASEAN countries through the signing of the Agreement on the establishment and implementation of ASEAN Single Window (2005) and the Protocol on the development and implementation of ASEAN Single Window (2006). The General Department of Customs of Vietnam is trying to coordinate with the Ministry of Industry and Trade, Ministry of Information and Communications to plan the official implementation of ASW on C/O form D to other countries in the region.

The similarity of major items of AEC member countries such as rice, fertilizer, textiles… lead to the greater pressure of competition. If the process of linking together into one community takes place too quickly, it may lead to the loss of market edge and force mutual competition. Therefore, in order to improve the competitiveness, reducing the risks of exporting goods in the community, Vietnam's participation in the value and supply chain in ASEAN must satisfy at least three aspects, i.e., large-scale production, timely delivery, access to appropriate distribution channels.

Technical standards are among the risks faced by Vietnamese exporters when entering the ASEAN market. One of the aspects of cooperation within the AEC framework is cooperation in technical standards and norms. However, ASEAN countries have different levels of development as well as different objectives and policies. Therefore, the unification of a common technical barrier between ASEAN countries is very difficult (Van Chi 2016). Technically speaking, in developed countries, international standards are often met, while in less developed countries, technical standards are rather arbitrary, often proposed by business associations and not by the governments. The large disparity in economic development level, socio-cultural conditions of ASEAN countries leading to problems, related to the inconsistency in customs procedures and technical regulations, pose risks to Vietnamese exporters. The overlap in quality standards has led many Vietnamese exporters to "shuffle" when they have to meet many standards and regulations at the same time and even risk the transaction. In addition, the implementation of ASEAN Single Window has only completed the linking in terms of Certificate of Origin (C/O); other related administrative procedures such as the quarantine certificate, food safety certificates or exchange of electronic vouchers… have not been provided, which causes risks for the export activities in ASEAN region.

A typical example of the technical barriers of Thailand market – Vietnam's leading trading partner in the ASEAN region. In fact, during the process of exporting goods to this country, many technical barriers set up by Thai companies have caused risks for export companies. Requirements of packaging, labels, import certificates and permits… may lead to risks. In the programs introducing Vietnamese products, Thai consumers are very much interested in agricultural and seafood products such as Da Lat butter fruits, dragon fruit, Japanese-origin sweet potatoes, catfish (cá ba sa)…. The risks of Vietnamese goods do not come from quality. When Bac Giang litchi is exported to Thailand, it is still reimbursed due to the requirements related to the standard size of the product, although it is eligible for circulation in the fastidious market with agricultural products such as Australia. Thailand's control system of imported goods is particularly strict with the requirements of package, packaging specifications and brands. As a rule, the packaging of the products must be made of

guaranteed materials, heat resistant, moisture resistant. Some Vietnamese exporters use waterproof packaging or use hay and straw for packaging, which reduces the quality of the goods in the process of transportation and preservation and therefore do not meet the requirements.

Box 1

Risks involved in agricultural products

Currently, many countries in the ASEAN region, especially Malaysia, Thailand, Singapore ... have constantly changed some regulations in importing agricultural products such as traceability and food safety. Relevant ministries and branches, especially the Ministry of Agriculture and Rural Development, should actively coordinate with other ministries and customs authorities in the region in updating their regulations on agricultural, forestry and fishery products. Enterprises of both sides have demand on agricultural products; however, due to the new regulations from the importing country in ASEAN, many exporters are still unable to grasp these adjustments. The fact that ASEAN partner countries require high quality will still create risks for Vietnamese exports, but it will become an opportunity for Vietnamese exporters to improve quality and be more active in production – business activities.

Customs General Departments of ASEAN countries, together with relevant Ministries of Vietnam, can coordinate to organize international seminars aiming at exchanging information and professional skills on food safety, animal and plant quarantine, regulations. The seminars may help Vietnamese exporters grasp the process to comply with regulations, thereby focus on building raw material areas to traceability, ensure product quality to export to markets in ASEAN countries.

Interview with Prof. Nguyen Van Song, Former Dean Faculty of Economics and Rural Development, Vietnam National University of Agriculture

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Singapore is also a high demand market for quality products, including packaging, labelling, animal and plant quarantine and standards for goods and services. In particular, for electronic items, equipments and components, the Singapore Safety Authority has issued 35 specific requirements for standards, norms and a list of regulated electronic devices (Ministry of Industry and Trade, 2016). Or, for food and fishery products, the sample must meet all food safety requirements and other requirements for each specific item in the "Sale of Food Act" to be imported into Singapore. In addition, food items must be labelled in accordance with regulations to be imported and consumed in Singapore.

Moreover, the domestic environment has not really facilitated good conditions for the exporters of Vietnam. There is a lack of information for the process of integrating and engaging in the regional market. Vietnamese exporters are always "hungry for information" about the new demand in the market, including macro demand. This is the situation even with traditional and important markets such as the ASEAN region.

Most of the exporters have not grasped the legal characteristics of these markets. They do not have information on technical barriers and sanitary and phytosanitary measures. In addition, exporters have not studied specifically about the rules of origin, tariff reduction before

planning their production and export activities. This leads to risks while exporting. Vietnamese's small and medium exporters are not only small in scale, capital and technology but also more backward than other ASEAN countries. Their vision and business thinking are rather limited and short-sighted, which also lead to risks in export activities. If tariff barriers are removed completely, then the requirement of origin emerges as a new barrier to business. To meet the requirements of origin of goods when exporting to ASEAN countries and enjoy the tax incentives, exporters must prove the origin of goods according to the rate specified for each item.

Box 2

Where does the risk come from?

Although a number of large exporters in Vietnam, which have established a considerable reputation in the market, they face many risks when penetrating the ASEAN market. The main reason is that most businesses still lack official and detailed information about this market and they must gather information by themselves that takes time and cost, so Vietnamese businesses are still "hesitant". Exporters have not bravely grasp the opportunity, because they have a psychology of doubt, fear of risk, lack of confidence in their capabilities. One of the reasons is due to lack of understanding about the regional market.

Interview with Dr. Nguyen Thi Ngoc, Hoa Binh University, Hanoi 12 February, 2019.

A survey by the Vietnam Chamber of Commerce and Industry (VCCI) showed that, after one year of establishment, only 16% of Vietnamese businesses really understand about the ASEAN Economic Community (AEC) (Van Chi, 2016). In the era of information technology, exporters continue to face the lack of specific information which meets the demand and directly affects their business activities.

In recent years, Vietnam's steel exports are mainly to ASEAN countries, as these markets have great demand in terms of quantity but are not too strict in terms of quality. However, in the context of ASEAN countries applying many trade protection remedies, exports to this region have faced many risks and great losses. In 2015, the Malaysia Ministry of International Trade and Industry (MITI) **conducted anti-dumping investigations for Vietnamese alloyed and non-alloyed cold rolled coil of thickness of 0.2-2.6 mm and width of 700-1300 mm in this market.** Apart from trade competition, steel is issued because all countries want to be protected for development. However, the main reason for the investigation was due to the lack of understanding of the laws and management mode of the importing country. Another risk is that, businesses sign very sketchy contracts and often do not use legal tools to protect their interests. Businesses only meet a number of basic terms such as quantity, price… and most of them ignore the terms on penalty or compensation (Hai Van, 2015).

Covid-19 pandemic started in Wuhan, China, in December 2019 and began to spread strongly to Vietnam, ASEAN countries, many countries and regions around the world. This pandemic raging throughout 2020, especially starting in March 2020, has caused disruptions to regional and global trade chains. This greatly affects the import and export of goods in Vietnam. Thanks to good control of the Covid-19 epidemic in the first quarter of 2020, the export growth to ASEAN countries and a number of other major partners has progressed in a

positive trend. Vietnam's export performance from April 2020 to December 2020 was adversely affected by this pandemic.

In that context, Vietnam's goods importers from ASEAN announced that they would postpone their orders in April and May and have not temporarily negotiated an order from June onwards (normally every year, this is the time when parties negotiate for year-end orders). The main reason is that the importers use the Force Majeure clause when these countries close cities, even nationwide, people are required to stay at home. For this reason, products such as textiles, garments, food, footwear, wooden products... are suffering from the Covid-19 epidemic due to the improvement of raw materials from Q1 in 2020. However, it is now facing difficulties in output markets, especially the main export markets of Vietnam, namely ASEAN, the US and the EU.

However, so far, Vietnam has basically controlled this pandemic, it is expected that exports to ASEAN countries will increase again in 2021. This expectation can become a reality if ASEAN countries can also control the Covid-19 pandemic like Vietnam.

Measures to Mitigate the Risks of Goods into the ASEAN Market

The common point in previous studies (mentioned in the section on literature review) is that they clearly identified the need to take into account political, social, economic and technical factors and risk assessment related to potential hazards while developing, analyzing and comparing legal options in order to choose the optimal adjustment measure for safety from that hazard. Thus, the awareness of the types of risks in export needs to be popularized at both micro and macro levels, thereby creating specific strategies to protect Vietnamese exporters against those risks. It can be said that to reduce the risk and thereby increase the export of Vietnamese goods to ASEAN markets, the Vietnamese government and exporters must focus on early and full identification of risks and finding out where they come from; measure, analyze, forecast these risks and solutions. At least, there should be a focus on the following two groups of measures:

Firstly, the measures by the government. In Vietnam, the government plays a role in regulating the market in the introduction of goods to foreign markets. In particular, the Ministry of Industry and Trade should regularly review the projects on export production, timely remove difficulties to put export production projects into operation and sustainable growth. The Ministry of Industry and Trade should also coordinate with relevant ministries and departments to promulgate documents that help businesses increase its added value and produce products that meet the quality and appropriate standards and are suitable to the demand of the customers in ASEAN countries.

The Government of Vietnam should establish channels of information for businesses in ASEAN markets. It should aim at building an agency for information collecting and processing as an information source for the businesses to refer to. By the end of 2016, official information on the ASEAN markets had been posted on the website of the Ministry of Industry and Trade. The E-Commerce Department of the Ministry also has an overview channel on the markets as well as import and export tariff tables so that enterprises can get

more information to boost export. However, most of the information is often sporadic and general. Businesses often find it difficult to make quick and effective use of the available information.

In addition to the implementation of specific measures to support exporters in terms of market information, capital, exchange rates… the Government should continue to accelerate administrative reforms to create favourable conditions for the issuance of certificates of origin, customs procedures and related procedures to promote exports to the ASEAN market. Specifically, it is necessary to create favourable conditions for the exporters to issue the certificates of origin on their own by simplifying administrative procedures, shortening the time for issuing C/O by using electronic C/O as well as improving the C/O e-system.

The Government should monitor and examine the economic and trade situation inside and outside ASEAN region in order to promptly respond to the unexpected changes from the importing markets. In the near future, it is necessary to accelerate the development and application of national standards in line with regional standards, especially ASEAN standards. In addition, the Government should provide consultancy, support and training of high-quality human resources to help businesses produce and export goods into ASEAN markets.

Another measure of this group is that the Government of Vietnam should accelerate the process of comprehensive economic integration through trade agreements to be able to intervene in dealing with legal risks occurring to the disadvantage for exporters. The directions for accelerating economic integration include: (i) active implementation of commitments under FTA, particularly the implementation of the ASEAN FTA/CEPT, ASEAN – China FTA (ACFTA), Vietnam – US Trade Agreement (BTA), Vietnam – EU Free Trade Agreement (VEFTA), Vietnam – Korea Free Trade Agreement (VKFTA) and ASEAN Economic Community (AEC) (Ngo Xuan Binh, 2017).

Currently, the Regional Comprehensive Economic Partnership (RCEP) is a new cooperative mechanism of 16 Asia – Pacific countries (including 10 ASEAN countries and 6 partner countries). It has reached a flexible agreement in many areas, including market access. The scope of RCEP is a high-quality free trade agreement aiming at a higher goal of forming a comprehensive partnership between ASEAN and the six partners. The current RCEP focuses on the reduction of tariffs and free trade, which are applicable not only to trade in goods, services and investment such as TPP, but also expand to broader areas including intellectual property, environment and labour. As of September 2019, 16 countries have concluded negotiations on issues such as customs and trade facilitation, state procurement, economic and technical cooperation, and small and medium enterprises (SME). However, at a meeting held in November 2019, countries failed to reach an agreement on RCEP when India decided to withdraw from the seven year-long negotiations on this agreement. Specifically, the Indian side stated that the current form of RCEP does not reflect the basic spirit and guiding principles agreed upon previously (Tapchicongsan, 2019).

Nowadays, regionalism in Asia is creating many changes, especially in the economic field. RCEP negotiating countries still have many concerns about trade deficits with other member states like China. Further promotion of free trade will likely create a larger trade deficit in ASEAN countries as well as in India's trade relation with China. The Indian side is concerned

that regionalism will create negative effects on the Indian economy with regard to the trade deficit issue if it joins RCEP. Two-way trade between India and China reached US$95.5 billion in 2018. However, China's trade surplus with India was 53 billion USD. India is not at all willing to lower its trade barriers (Tapchicongsan, 2019).

Secondly, the group of measures to be implemented by the exporters. Vietnamese exporters need to develop strategies to penetrate and develop their commodities in ASEAN markets. Those which are well awared of import and export procedures will change their own business strategy towards ensuring the regulations as well as improving the quality and competitiveness of products.

As mentioned in the section on literature review, most studies indicate that local exporters need to work towards building a systematic, cost-effective and practical internal procedure in order to create solutions when risks arise in each respective export market. Risk management is a combination of three specific steps, i.e., (i) risk assessment, (ii) risk control and (iii) risk monitoring. This paper is of the view that the three-step combination of risk management is also consistent with the '5M + C' model that it proposes, i.e., exporters must actively reform their governance and build appropriate business strategies; promote linkages in the chain to increase value; enhance its competitiveness and meet the needs of ASEAN markets. Each enterprise needs to improve its competitiveness in the "5M+C" model, namely "Machine innovation" – M1), "Money innovation" (M2), "Management innovation" (M3), "Marketing" (M4), "Men, Human Resource" (M5) and "Enterprise culture" (C).

In market penetration and market system building strategies, exporters need to adopt mixed marketing systems based on products, pricing, distribution and advertising decisions. For Vietnamese enterprises exporting goods to ASEAN countries, it is important to focus on product, distribution and advertising decisions so that they can take full advantage of this potential market.

To penetrate deeply into these markets, businesses need to diversify their products and focus on building their brands. Currently, it is quite common that Vietnamese goods exported to ASEAN countries, especially agricultural products such as coffee, pepper, tea… do not have a brand or hide under another brand. In this situation, Vietnamese exports have to suffer double losses due to the lack of awareness of brand building and protection. Localities and exporters in Vietnam should be aware of the role and significance of brand building and development.

Establishing an appropriate and effective distribution and sale channel is also a measure that Vietnamese exporters should utilize. Exporters should determine they sell goods to customers through the direct distribution channels or through intermediaries; the number of distribution channels, points of sale; the combination of channels… For example, in Singapore, in recent years, online retail is growing, as more brands offer more conveniences to customers. The chain of convenience stores in the free residential areas and the increase in the number of speciality retailers providing high-quality food continue to increase. Exporters in Singapore have appropriate distribution strategies for each type of product to meet the need of the customers. Focus is put on the identification of competitors. Vietnamese exporters should learn this experience in order to reduce the risks and increase business efficiency.

In the communication activities, Vietnamese exporters need to understand the characteristics of the markets and the import-export process of each market and anticipate solutions to respond to unexpected situations. While exporting to the ASEAN market or dealing with a new partner, exporters should explore the cultural, religious, political and economic characteristics of each market as well as its financial strength to ensure the efficiency of export activities. Product promotion should be linked to the culture of each country in which religious factors are taken into account. For markets with a predominantly Muslim population such as Malaysia, food containing beef or pork or its derivatives thereof, or lard, must be declared… or use any other words to inform the buyer of this. Meat and meat products must have the "Halal Food" logo issued by the Islamic Development Authority of Malaysia (JAKIM).

In the context of Vietnam's deep integration into markets of different continents, the quality of goods must meet the international standards for each specific commodity. For a long time, Vietnamese agriculture was not based on market demand. Farmers focused on raising and planting products, which have a high price and pay little attention to the market demand. Although there is much strength in agricultural production, 90% of Vietnam's agricultural products are still exported in raw form, leading to the difficulty in its consumption because due to issues related to preservation and risks during transportation. The technology of preserving and processing agricultural products in Vietnam is very backward. Even in some of the key provinces of the Mekong Delta, there is not any enterprise involved in the processing sector (H.Chung 2017). There is a lack of maintenance facilities, such as the cool storage at the raw material areas.

Box 3

Risk mitigation strategy needs to be based on Vietnamese enterprises' weaknesses

Small and medium exporters are first exporting encounter difficulties in promoting products, packaging design and product quality meeting required standards, therefore, every step is crucial. Compared to other partner companies in ASEAN, many Vietnamese exporters are lag far behind in development potential, experience and the ability to use foreign languages, causing misunderstandings about technical regulations, especially in some countries requiring Halal certification. Finding proper ways to overcome these weaknesses may help reduce the risk when supplying goods into this market.

Interview with Dr. Nguyen Binh Giang, Deputy Director of Institute of World Economics and Politics, Vietnam Academy of Social Sciences, 04 February, 2019.

Besides the specific measures for the exporters in market research, the manufacturing facilities of the exporters should also work closely with the suppliers of raw materials to ensure safety. Vietnamese agricultural products are also exposed to many risks due to natural disasters, epidemics… which make the supply of raw materials unstable. In addition, the scale of agricultural production is fragmented, technology is backward and the preliminarily processing and preservation is based on the experience of the farmers. Therefore, in many cases, the products do not meet the standards for goods exporting to some countries with relatively strict technical barriers, such as Singapore, Malaysia… Enterprises should monitor the operation of the production facilities to ensure the quality of agricultural products, to meet

the technical demand of the buyer and help protect their trademarks, avoid the phenomenon of counterfeit goods which adversely affect their reputation.

Moreover, through associations, small and medium enterprises in the country should work together to protect their interests against the risks of export. The business community should be more concerned about updating the new standards within ASEAN and determine the impact of those technical regulations on the exports of each enterprise. The timely adherence to legal regulations of the ASEAN countries, especially technical regulations, food hygiene and safety (with enterprises exporting agricultural products), will help businesses actively raise the ability to exploit the market and apply the quality management standards right from the selection of export products and suppliers which will help reduce risks. Investment and Trade Promotion Centre of Ho Chi Minh City host lots of forum for managers and businesses for sharing information and solutions to limit risks through experiences in promoting international markets, including the ASEAN market. In the framework of the ASEAN market and export forums, experts have provided detailed advice on how to supply goods in multinational supermarket chains, providing products with Halal certification for Islamic countries in the ASEAN region, while managing financial risks in the export process.

Box 4

Promoting cooperation aimed at reducing risks

To meet the demand for breaking into the market or link with other ASEAN enterprises, Vietnamese enterprises, especially small and medium exporters instead of self – access should connect with reputable govenrnment organizations such as Department of Industry and Trade. According to many partner companies in ASEAN, the prestige of small and medium exporters will increase significantly when entering the market together with associations or govenrment departments. Unless through a Trade Promotion agency, small and medium-sized enterprises are likely to remain unconnected after a year. Exporters through Trade Promotion agencies can correctly perceive the market, leave stage of surveying the target market. In addition, along with the Trade Promotion agencies, businesses will easily connect to the supermarket chains, commercial counsellors or the Vietnamese Embassy in the host country, because these agencies have direct and specific instructions on contact methods, technical regulations of products and goods. The most important factor is the boldness of enterprises. This is also a solution to reduce risk.

Interview with Prof. Do Hoai Nam, Former President of Vietnam Academy of Social Sciences, 10 February, 2019.

It is to be noted that over-reliance on one market poses risks to the exporters. This is because if there is a fluctuation from that market on raw materials – inputs for production, all sales, profits, jobs and income of workers will be reduced. Vietnam should promote market diversification and enhance its trade relations with the US, EU, Japan and South Korea (Ngo Xuan Binh, 2017). In order to avoid risks for exports, Vietnam should aim at expanding the export market, taking advantage of international integration opportunities to promote exports, especially taking advantage of Free Trade Agreements (FTA) to create a new competitive edge for exporters. The participation in ASEAN Economic Community (AEC) requires Vietnam to grasp the movement of this process and encourage the engagement of its exporters in AEC. With the formation of AEC, there are about 50 bilateral and multilateral FTAs that ASEAN countries are implementing or taking part in its negotiation. Therefore, if we rely on

ASEAN, together with other ASEAN countries, to agree on a number of important issues, including the integration of FTAs with intra-regional partners, Vietnam can enhance its position in its relations with big powers such as the US, Japan, China and India… It is important for Vietnamese exporters to make good use of the FTA preferences to identify key markets and focus on meeting the technical and quality requirements of this market to increase the number and value of export orders. Exporters need to tackle the defects in market identification, focusing on highly potential markets with clear commercial corridors to avoid uncontrollable risks. Exporters can assess the potentials of a market by studying the total import demand of that market. As of July 2019, Vietnam participated in a total of 16 FTAs (including all 3 FTAs under negotiation), in addition to the first 9 traditional FTAs Vietnam joined with partners in the ASEAN region or with ASEAN's common partners in Asia, there are also 4 new generation FTAs (VCCI, 2019). Recently, The European Union Vietnam Free Trade Agreement (EVFTA), signed in June 2019, is considered a new generation bilateral agreement – it contains important provisions for intellectual property (IP) rights, investment liberalization and sustainable development.

Thailand, despite being competitive with Vietnam in most agricultural, forestry and aquatic products for export, yet it is possible for some goods to penetrate into this market. According to the assessment of many Vietnamese experts, Vietnamese goods have their own strengths that Thai goods do not have, such as quality, constant supply, competitive prices. Therefore, Vietnamese exporters should not be too cautious. Instead, they should have appropriate trading strategies. Currently, Vietnam MM Mega Market Company has been connecting domestic exporters to more than 700 Big C supermarkets in Thailand. Initially, more than 1,200 tons of dragon fruits were exported to Thailand. They are also connecting Vietnamese suppliers to export some other commodities, especially agricultural products. According to the survey of MM Mega Market, Thai consumers are very much curious and willing to try new products. In the programs introducing Vietnamese products, it is shown that Thai consumers are very much interested, especially agricultural products such as Da Lat butter fruits, dragon fruits, Japanese-type sweet potatoes, catch-fish… (Ha Anh, 2017).

Thus, in order to penetrate deep into the ASEAN market and join the global value chain, Vietnamese exporters need to change their thinking in the production process, focus on creating added value difference in their products, avoiding the mass production of low-value items. In order to ensure the effectiveness and sustainability of export development, it is more important that the goods should give consumers "special effects".

Conclusion

Currently, ASEAN is one of the leading trade partners of Vietnam. It is also the crossing area of many bilateral trade agreements between ASEAN and other intra-regional and extra-regional partners. This will open opportunities for Vietnamese goods to reach out to larger markets such as China, Korea, India, and Japan… Vietnam – ASEAN trade turnover is growing both in depth and width. However, in the current period, requirements for higher quality export products are major challenges (risks) for Vietnamese exporters, especially in the context of trade protection remedies being used by partners, such as rules of origins and

technical regulations. This is the main cause of constant risks to Vietnam's exports to ASEAN. The issue is not only to ensure the quality of products according to standards, but also to strive for "superior" quality and show the "difference" of the product in comparison to the products of the same type in the market. Developing new products and renew the existing products using modern technology etc., is an important factor to gain, retain and expand the market effectively.

The Government of Vietnam should work with enterprises to get information on integration, the legal basis and the mechanism for settling disputes. In other words, In order to minimize risks for goods exported to ASEAN, the Vietnamese government and exporters need to work closely with each other in identifying risks, forecasting and handling risks. The Government needs to support exporters, not only to help develop ASEAN market information systems in Vietnam but also to continue providing export credits to these enterprises through the state commercial banking system. At the same time, strengthening cooperation and increasing dialogue with governments of ASEAN countries to improve the legal environment, creating favourable conditions for Vietnamese exporters in handling risks and trade disputes. It is important to emphasize that, in order to avoid risks when exporting to ASEAN markets, enterprises should not only increase market research but also enhance connectivity and transactions with importers from ASEAN to be updated about market information and tastes of customers in each ASEAN country.

It should be emphasized that even when the ASEAN economic community commits to the best implementation of the intra-bloc agreements, the risks of origin, specific technical standards (associated with certain types of goods and associated with culinary culture...) and uncontrolled Covid-19 pandemic, there are still risks to Vietnamese goods exported to ASEAN markets. This shows that Vietnamese exporters continue to face these challenges. In 2020, as the fifth chair of ASEAN, Vietnam had proactively connected, hosted and organized many seminars with ASEAN partners to mitigate these risks. ASEAN partners (government and businesses) also share this view with Vietnam.

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ANALYSIS OF THE SELECTED ENTRY STRATEGY OF BLUE BOTTLE COFFEE ROASTER[6]

The article is relevant because the coffee market is one of the most profitable and e-commerce brands. The paper aims to study the theoretical foundations of developing a strategy for promoting a foreign company to the domestic market and to develop practical recommendations for the promotion of "Blue Bottle Coffee" in the coffee market in Ukraine. The methodology of the article is based on a few stages of implementation of marketing strategy. According to the results of the research, the level of potential demand for products and services of "Blue Bottle Coffee" in the Ukrainian market will increase in 2021-2022, but under the condition that the company will develop and expand points of sale, to carry out an effective marketing communication policy. In the next 3 years, potential consumers will become acquainted with the activity of "Blue Bottle Coffee" in the Ukrainian market. However, neither a perfect commodity policy nor a well-balanced pricing policy and a well-chosen distribution system will not be able to provide the appropriate economic result to production and marketing enterprises without an effective system of implementation of promotion strategies.
Keywords: marketing strategies; SWOT analysis; international companies; coffee market; enterprise; consumer; product; price
JEL: D24; D47; M31; P42

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1. Introduction

"Blue Bottle Coffee" is one of the world-class coffee companies that emerged in 2002 and has since transformed the initial point of sale of coffee at a favourite local convenience store in the Bay Area into a global and online e-commerce brand.

The success of "Blue Bottle Coffee" has also been to develop a cognitive program for the roasting, brewing and consuming coffee that will bring this level of coffee connoisseurs to customers who may never step into a true "Blue Bottle Coffee" shop. The way to get the information you needed was to develop content marketing. By creating in-depth brewery guides, training videos, and courses on buying, storing, and brewing great coffee, "Blue Bottle Coffee" has been able to make its brand synonymous with third-wave coffee and truly spread appreciation for homemade coffee to new customers (Hollis, 2018). This helped the "Blue Bottle Coffee" go beyond simply selling grains and setting a higher price for their produce. Today, the "Blue Bottle Coffee" brand is extremely well known and in high demand.

In this paper, the authors explore the concept of a foreign company's strategy for entering the coffee market of Ukraine based on "Blue Bottle Coffee" roasters. The offered model was tested in the Ukrainian coffee market in 2019. Thus, people face the problem of real-time decision making in conditions of real situations, which is based on modelling and forecasting. Clearly, the efficiency of the decision depends on the information about the process development because their measurements are not always accurate. Thus, try to estimate research in a real case.

2. Theoretical Background

The globalisation of marketing activity is a well-known phenomenon, and the global marketing strategy (GMS) has been the subject of intense scientific debate and research for decades. GMS is a strategy aimed at unifying the company's marketing efforts in several different regions of the world (Johansson, 2010). Many studies suggest that a firm's GMS affects its performance in the global market (Perreault, Cannon, McCarthy, 2019; Douglas, Craig, 2011; Griffith, 2010; Katsikeas, Samiee, Theodosiou, 2006; Robson, Schlegelmilch, Bojkowszky, 2012; Ryans, Griffith, White, 2003; Wu, 2011; Zou, Cavusgil, 2002). However, for the coffee market, the study of GMS is still limited.

Coffee is one of the world's most valuable tropical agricultural products, which has gained special popularity in recent decades. There was a transformation of approaches to coffee as merchandise goods (Choose a market entry strategy, 2020; The three waves of coffee, 2020). On the one hand, the emphasis is on the quality of coffee, which comes from different geographical areas, differentiated by their climatic conditions. This feature of the product was emphasised by Norwegian immigrants to the US E. Knutsen in 1974 and received the definition of "specialty coffee" (Marc, 2019). On the other hand, the quality of a product is more connected to the culture of its consumption. The first to pay attention to the culture of coffee consumption was in Skeie (2003). After that, this topic was developed in Williamson (2017).

Thus, T. R. Skeie (2003) has divided the current stage of development of the coffee industry into three stages, guided by such indicators as the process of preparation, consumption, and distribution. Today, the fourth coffee wave is being singled out, the pioneers of which are Robert Paulig Roastery and Artisan Café (Robert Paulig Roastery, 2020; Artisan Café, 2020). It is characterised by such components as the science of coffee, measurement of the brewing process, determination of coffee properties, water quality, development of equipment for coffee brewing of brewing equipment (The three waves of coffee, 2020). The main tenets of the 4 waves of the coffee industry are: quality; coffee production; sustainable development; comprehensive taste (Korhonen, 2020).

Further research indicates that the consumer market for high-end ("specialty coffee") remains limited due to the supply of plantations, or consumer demand. This proposal is an intermediate innovation, as it upsets the market equilibrium and forms a parallel model of coffee consumption, where the place of branding is a plantation enterprise, not a company that provides coffee consumption (consumer corporations). However, the lack of digital technologies in the field of marketing will not allow plantations in the coming years to significantly influence the coffee market. This creates great opportunities for large companies to capture a significant share of the high-end specialty coffee market. In addition, changing tools in the implementation of marketing strategies in the coffee market can potentially change the way coffee is drunk (Lindstrom, 2016; Leach, 2018).

One of the main players in the movement to transform coffee from a simple goods into a cruft, Blue Bottle Coffee has played the role of high-quality coffee producer. To achieve such success allowed their barista training program. The second strategic decision was cooperation with farmers. Leading company's experts travel in search of the best and ecological coffee sorts. Only the best varieties of coffee are produced, where it is roasted depending on tastes and preferences (Hollis, 2018; Third wave coffee, 2020).

3. Aims, Hypothesis and Methods

Unfortunately, the level of roasting of coffee depends on the tastes and preferences of consumers, not the preferences of the company's experts. Therefore, to determine the roast and choose the type of coffee should be based on marketing research and strategic plan. Drawing up a strategic plan should be based on certain stages (Frolov, 2012):

1. Determination of the projected level of demand for goods, goals and objectives of the organisation in the international market.

2. Analysis of the company to work in the target segment.

3. Assessment of the state of competitive position and level of competition.

4. Determining the adequacy of costs for the promotion of goods in the new market.

Will analyse these stages in more detail.

1. Determine the forecast level of expected demand for coffee, blow up the logistics of supply to foreign markets.

To achieve the strategic goals of coffee sales, it is necessary to calculate the projected level of demand (Molchanova, Doroshenko, 2020):

$$D_{ni} = \int (E_i * C_i * t),\qquad(1)$$

where i – certain coffee in the new market, $i = 1, n$; ni – quantity of the i-th type of coffee; D_{ni} – the projected level of demand for the i-th type of coffee; E_i – target market capacity for the i-th type of coffee; C_i – the price of one ounce the i-th type of coffee; t – the time at which n can be realised the i-th type of coffee.

Company's profit (P_{ni}) can be defined as (Molchanova, Doroshenko, 2020):

$$P_{ni} = \int (r_i * C_i * n_i * t),\qquad(2)$$

where ri – profitability of selling a ounce the i-th type of coffee.

The next stage is to define strategic goals. To calculate them, we use the formula from probability theory: the number of trial purchases and the time of their completion (Yurashev, Shelest, 2003; Suprun, Stratychuk, 2016):

$$x(t) = \frac{L*C*e^{(\alpha\alpha+\beta)} - \beta}{\alpha+C*e^{(\alpha\alpha+\beta)}},\qquad(3)$$

where $x(t)$ – the number of consumers who made the first purchase; L – number of potential buyers, $L\rightarrow max$; α, β – coefficients that characterize consumers' ability to follow and innovate, respectively, or the probability of purchasing over time t, $\alpha = [0; 0,8]$, $\beta = [0; 0,05]$; $t = f(x)$ – time determination, i.e. t is an inverse function $x(t)$.

So (Molchanova, Doroshenko, 2020):

$$PD_i = p * (x * \delta - M) * \Delta t,\qquad(4)$$

where δ – estimated frequency of purchases of the i-th type of coffee over time Δt.

Based on the calculations, we can say that when the need for p = 0, the demand for coffee in the selected market is absent. We need to reconsider the strategy for this market, or change the market.

When PDi > 0, the demand for the product exists and we can analyse the company's ability to work in a specific target segment in a particular type of coffee.

2. Analysis of the company's financial gold to operate in a specific market in the target segment

Analysis of the adequacy of the company's funds to enter new markets. Diversification of sources of financing by the company of development of new markets can be defined as (Molchanova, Doroshenko, 2020):

$$Q_{max}^i = \sum\nolimits_{t=1} v^i l,\qquad(5)$$

where i – certain type of coffee, $i = 1, n$; $Q^i max$ – capacity of all fixed assets of the company; $v^i l$ – power; l – production unit of fixed assets to produce coffee; q – number of ounces.

Determining the company's competitive position in the market. The calculation is possible as a comparative analysis with the average data by industry:

$$PR_l^i = \sum_{t=1} p^f * Y, \tag{6}$$

where PR_l^i – prospect of the company development l; f – a factor that is crucial to a particular type of coffee, $f = 1, m$; p^f – the weight of the f-factor.

Having determined the company's competitive position in the industry, we find the average value of indicators (PR_{av}). To determine the effectiveness of the proposed strategy to enter new markets, it is necessary to make assumptions about the effectiveness of the company based on inequality. Efficiency is determined on the basis of criteria (Table 1).

Table 1

Criteria for determining possible marketing strategies based on enterprise performance

Criteria	Marketing strategies
Q_{max}^i $\leq PD_i$	the company will not be able to meet the demand for its product in the new market with available capacities, the outlook is not optimistic
Q_{max}^i $\leq PD_i$	a company with the available capacity will not be able to meet the demand for its product in the new market, but there is a prospect of its development. Therefore, it is necessary to identify the weakness in the potential of the company and take measures to strengthen it
Q_{max}^i $\geq PD_i$	the capacity of the company allows to meet the demand for its goods in the new market, but the basic values of the influencing factors are not very satisfactory, so it is necessary to identify the weak spot of the potential of the company and take measures to strengthen it
Q_{max}^i $\geq PD_i$	the company will be able to provide projected demand for its product in the new market and has all opportunities for further development in a specific target market

Source: Molchanova, Doroshenko, 2020.

Thus, only in one situation (system IV) can decide on the choice of marketing strategies. Because the choice of strategy to enter new markets will depend on the analysis of the components of the company's potential. The situation of the II and III systems cannot satisfy the specified criteria.

The potential of the company is determined by the method of "square of potential" or graphical-analytical method. The method is based on four components: *PM* (marketing), *PZB* (sales), P_{vi} (production) and P_{fin} (financial) (Bozhkova, Nasonova, 2016; Armstrong, Kotler, 2020).

The function of the "square of potential" will be the area of a quadrilateral, which is the sum of the areas of four triangles (Figure 1) (Molchanova, Doroshenko, 2020):

$$S(\Pi) = \sum_{t=1} S i \tag{7}$$

where Sj – the area of the triangle j; Sj=$\sqrt{a^2 * b^2}$.

Based on determining the area of the potential of the company, it is possible to analyse its capabilities (Prokopenko, Shipulin, 2004; Soloviev, 2008):

1) S (P) < 300 ounces – the company has little potential. The company cannot meet the demand for coffee in the new market;

2) $300 \leq$ S (P) < 700 ounces – the potential of the company is medium. Market entry for the company will be slow. There is moderate competition. Consumers react sluggishly to "new" products;

3) S (P) ≥ 700 ounces – the potential of the company is high. The market is highly concentrated and ready for a "new" product. The company can also pursue aggressive market entry strategies.

Figure 1

An example of building a square of potential: 1-4 – its components
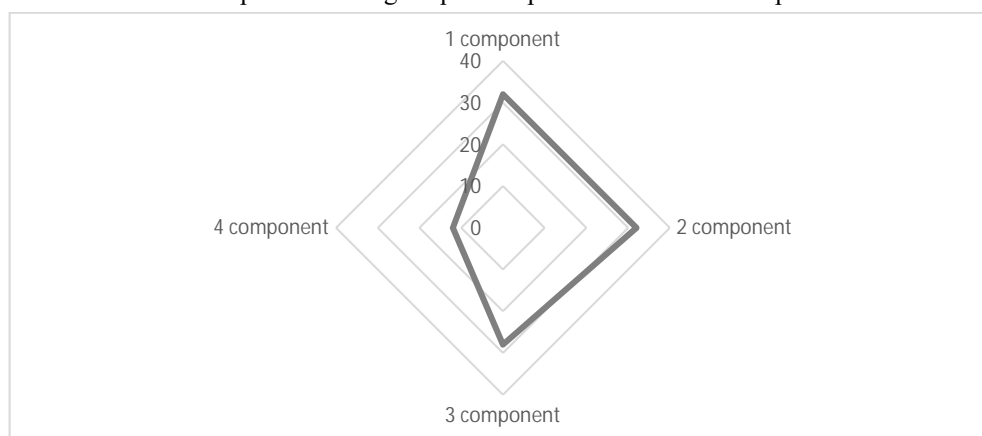
3. Assessment of the state of the competitive environment of the company

To analyse and assess the state of the competitive environment, we calculate the coefficient and index of concentration in the market (respectively *Krk* and *Irk*). These indicators make it possible to determine the competitive position of the proposed coffee with substitute products (Cotler, 2006; Cotler, Keller, Pavlenko, 2008; Armstrong, Kotler, 2020):

$$\text{Krk.} = \frac{Q^i}{Q^i b} * 100, \tag{8}$$

where Q^i – total volume of sales of substitute products; $Q^i b$ – volume of sales of goods-substitutes by type enterprises b; b – large (major) enterprises of the industry.

Market Concentration Index is calculated as (Cotler, 2006; Cotler, Keller, Pavlenko, 2008):

$$\text{Irk.} = \sum_{t=1} h_j^2 , \tag{9}$$

where h_j – market share of each j-th competitor organisation.

The above formulas allow us to determine the concentration of markets: high, moderate and low. A low-concentration market is a market where coffee satisfies a fundamentally new need

and there are no coffee substitutes on the market. Highly concentrated market – when coffee does not meet a fundamentally new need and there are coffee substitutes on the market. Also, when determining the concentration, the determination of the potential area should be considered. Thus, we have six situations (Table 2).

Table 2

Defining a previous set of marketing strategies

Market type	The size of the square of the potential	
	$300 \leq S(\Pi) \leq 700$	$S(\Pi) \geq 700$
Highly concentrated *Krk* > 70%; *Irk* > 2000	Widespread penetration strategy, passive marketing strategy	Selective or broad penetration strategy, passive marketing strategy
Moderately concentrated 45 < *Krk* < 70; 1000 < *Irk* < 2000	Selective or broad penetration strategy, passive marketing strategy	An intensive strategy, a strategy of selective or wide market penetration of a product
Low concentrated *Krk* < 45; *Irk* < 1000	An intensive strategy, a strategy of selective or wide market penetration of a product	An intensive strategy, a strategy of selective or wide market penetration of a product

Source: compiled by the authors based on (Cotler, 2006; Notes by the marketer, 2020; Analysis of the coffee market in Ukraine, 2020; Top 10 coffee-producing countries in 2015 according to ICO data, 2015; Armstrong, Kotler, 2020; HH Market Concentration Index, 2015; Molchanova, Doroshenko, 2020).

Thus, the analysis of six situations allows you to choose a specific plan for marketing strategy. Capability analysis provides additional advantages in certain tactical areas. In addition, it is necessary to take into account indicators of the feasibility of entering international markets (efficiency) and indicators that determine the return on investment of the project.

The next stage of the research is the selection and systematisation of methods for analysing the potential of the company when the company enters the Ukrainian coffee market. At this stage, the choice of marketing strategy for launching "Blue Bottle Coffee" to the Ukrainian coffee market (the company's growth strategy) implies the implementation of such stages (Frolov, 2012):

1. Determination of the projected level of demand for goods, goals and objectives of the organisation to enter new markets.

2. Defining the target market segments and the attitude of consumers to the price.

4. Results

Based on the above methodology for estimating the demand and cost of promoting "Blue Bottle Coffee" to the Ukrainian coffee market, it is necessary to calculate and evaluate the practical indicators of such a marketing strategy.

The results of the study and the calculations are presented in Table 3.

Thus, according to the results of Table 3, the level of potential demand for "Blue Bottle Coffee" products and services in the Ukrainian market was 45 437 people in 2020, and prediction in 2021 will be 97 517 people, in 2022 – 193 001 people, but under the condition

that the company will develop and expand points of sale, conduct an effective marketing communications policy. Target market capacity will increase from 45 to 55% for 3 years period. The level of profit in thousand UAH will increase from 7875 to 15 593.

Table 3

Estimation of potential demand at the launch of "Blue Bottle Coffee" on the Ukrainian market

Indicator	2020	2021*	2022*
t – the time at which n can be realised, i-th product, years	5	5	5
Ci – the price of one unit of the i-th product, UAH	250	260	270
Ei – the target market capacity for the i-th product, %	45	50	55
Dni – days are the projected level of demand for the i-th product, persons	56250	65000	74250
ri – is the profitability of selling a single item	0,14	0,18	0,21
$P\ ni$ – profit of enterprise, thousand UAH	7875	11700	15593
L – number of potential buyers, persons	64125	74100	84645
i – the coefficients that characterise the consumers' ability to follow and innovate, respectively, or the probability of purchasing over time t	0,05	0,05	0,05
$x(t)$ – number of consumers who made the first purchase, persons	3206	3705	4232
δ – is the estimated frequency of purchases of the i-th commodity over time Δt, %	18	23	29
demand level PD_i, persons	45437	97517	193001

* future trends predictions
Source: compiled by the authors based on (*Entering new markets, 2020; Notes by the marketer, 2020; Analysis of the coffee market in Ukraine, 2020; Top 10 coffee-producing countries in 2015 according to ICO data, 2015*).

After determining the potential level of "Blue Bottle Coffee" demand in the Ukrainian market, it is necessary to carry out the second step of the marketing strategy/promotion of the studied enterprise on the Ukrainian market – to identify and analyse the target market and consumers' attitude to the Blue Bottle Coffee pricing policy.

It is worth emphasising immediately that "Blue Bottle Coffee" specialises in the production of high-quality coffee beans, the validity of the products produced is 12 hours. This means that products and services cannot be cheap, given the prices for resources and goods in the domestic market.

The results of consumer's attitude to the offered goods of "Blue Bottle Coffee" are presented in Table 4.

Table 4

Attitude of consumers to the price of "Blue Bottle Coffee", persons

Indicator	2020	2021*	2022*
Demand level PD_i, persons	45437	97517	193001
% of consumers who agree with the Blue Bottle Coffee policy	20447 (45%)	53634 (55%)	127381 (66%)
% of consumers who do not agree with the Blue Bottle Coffee policy	24990 (55%)	43883 (45%)	65620 (34%)

* future trends predictions
Source: compiled by the authors.

According to the results of the dynamics presented in Table 4 it follows that from 2020 to 2022 potential consumers will become acquainted with the activity of "Blue Bottle Coffee" in the Ukrainian market, be convinced of the quality of the offered coffee products and adopt

the pricing policy of this enterprise, leaning to the advantages of the activity of "Blue Bottle Coffee" in the Ukrainian market than to the disadvantages.

The next stage of the research will help to make sure once again that the research enterprise is ready, taking into account the existing production potential, to develop a new market. The results of the calculations are given in Table 5.

Table 5

"Blue Bottle Coffee" analysis for the target segment

Indicator	2020	2021*	2022*
Vil – capacity, thousand UAH	529,2	1143,1	2116,8
g – number of units, thousands	756	1633	3024
l – production unit of fixed assets for the production of goods, thousand UAH	0,7	0,7	0,7
Q_imax – capacity of all fixed assets of the enterprise, thousand UAH	158760	342930	635040
γf – the weight of the f-factor	0,06	0,06	0,06
w – weight of the price factor, which is the deciding factor for a product	0,09	0,08	0,07
PRl – the prospect of enterprise development	0,666667	0,75	0,85714

* future trends predictions
Source: compiled by the authors based on (*Entering new markets, 2020; Notes by the marketer, 2020; Analysis of the coffee market in Ukraine, 2020; Top 10 coffee-producing countries in 2015 according to ICO data, 2015*).

The results of the calculations presented in Table 4, provide information on the capacity of all the fixed assets of the enterprise necessary for the development of new markets. In this case, in 2020 it amounted 158 760 thousand UAH, but till 2022 the amount will increase to 635 040 thousand UAH.

The main condition for the enterprise to develop new markets is that the results of Qi max calculations are greater than the planned demand in the new market. For "Blue Bottle Coffee" in 2021 $Q_i$max = 342930 thousand; demand level PD_i, = 97517 thousand UAH. That is, the condition is fulfilled $Q_{max}^i \geq PD_i$.

The indicator of the prospect of enterprise development by the results of calculations is also more than 1, that is, the further prospect of the enterprise is its development.

The calculation of the data (Table 4) was conducted to determine the feasibility of the marketing strategy on the performance of the enterprise. The regulatory conditions for these indicators are presented in Table 6.

Table 6

Criteria for determining possible marketing strategies based on enterprise performance

Criteria	Marketing strategies
$Q_{max}^i \leq PD_i$ PR ≤ 0,3	the company will not be able to meet the demand for its product in the new market with available capacities, the outlook is not optimistic
$Q_{max}^i \leq PD_i$ PR ≥ 0,3	an enterprise with the available capacity will not be able to meet the demand for its product in the new market, but there is a prospect of its development. Therefore, it is necessary to identify the weakness in the potential of the enterprise and take steps to strengthen it
$Q_{max}^i \geq PD_i$ PR ≤ 0,3	the capacity of the enterprise allows to meet the demand for its goods in the new market, but the basic values of the influencing factors are not very satisfactory, so it is necessary to identify the weak spot of the potential of the enterprise and take measures to strengthen it
$Q_{max}^i \geq PD_i$ PR ≥ 0,3	the company will be able to provide projected demand for its product in the new market and has all opportunities for further development in a specific target market

Source: compiled by the authors.

For "Blue Bottle Coffee", the condition is fulfilled $Q_{max}^i \geq PD_i$; PR $\geq$ 0,3. That is, the enterprise under study will be able to provide projected demand for its product in the new market and has all opportunities for further development in a specific target market.

In addition to production potential, "Blue Bottle Coffee", when developing new markets, should analyse marketing potential, sales potential and financial potential. Based on the results obtained, construct a square of potentials. The initial data for constructing the square of potentials are presented in Table 7.

Table 7

"Blue Bottle Coffee" Potential Square Output

| Indicator	Production potential	Marketing potential	Sales potential	Financial potential
	8	6	9	5

Source: compiled by the authors.

The results of potential formation were based on the past experience of the enterprise functioning in the markets already developed in the existing ones. The results of the assessment were given on a scale of 1 to 10.

The potential square for "Blue Bottle Coffee" is shown in Figure 2.

Figure 2

Blue Bottle Coffee Potential Square
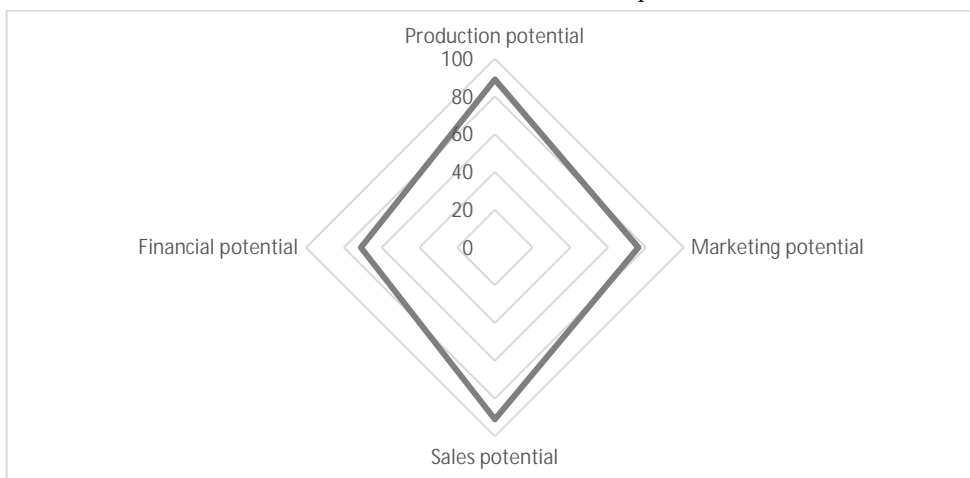
Source: compiled by the authors.

According to the results of this square of potentials, it is necessary to calculate the area of 4 triangles and based on determining the area of potential of the enterprise it is possible to analyse its possibilities.

S (P1) = 100 units;

S (P2) = 108.1 units;

S (P3) = 103 units;

S (P4) = 94.3 units;

S (n) = 405.4 units.

That is, $300 \leq S(P) < 700$ units, which means that the potential of the enterprise is medium, so it has such opportunities in which the penetration of goods into the new market will be slow and all measures should be developed, taking into account the market concentration of manufacturers. The marketing potential of the enterprise and the financial potential are problematic. Therefore, in the process of entering a new market, it is worth paying particular attention to these aspects.

It is advisable to use the methodology presented in the first section and determine the market competition coefficient and market competition index. The results of the calculations are presented in Table 8.

Table 8

Assessment of competitive position and level of competition in the development of new "Blue Bottle Coffee" markets

Indicator	2020	2021*	2022*
Qi – total volume of sales of substitute products	7,8	8,1	8,7
Qs – volume of sales of goods-substitutes by type b enterprises;	6,63	6,89	7,40
b – large (major) enterprises of the industry	7	7	7
Ck – competitive position	117,65	127,06	134,68
hj – the market share of competitors	85	80	75
Market Concentration Index	7225	6400	5625

* future trends predictions
Source: compiled by the authors based on (*Entering new markets, 2020; Notes by the marketer, 2020; Analysis of the coffee market in Ukraine, 2020; Top 10 coffee-producing countries in 2015 according to ICO data, 2015; Okhrimenko, Skorobogatov, Manaenko, Yaresko, 2018*).

From this it follows that according to the results of calculations of the level of competition and the index of market competition, as well as the results of the estimation of the square of potentials of "Blue Bottle Coffee", the condition *Krk* > 70% is fulfilled; *Irk* > 2000 (Table 2), i.e. the market is highly concentrated. An enterprise should use a broad penetration strategy and a passive marketing strategy.

5. Discussion

As a result of a survey of potential consumers, in order to determine the subjective opinion on the feasibility of promoting "Blue Bottle Coffee" in the Ukrainian market. According to the results of the research, it is established that of all the answers received, most Ukrainians support the idea of launching "Blue Bottle Coffee" on the Ukrainian market. Because the quick brewing of high-quality coffee will be cost-effective and appropriate.

Estimation of potential demand and consumer segment of "Blue Bottle Coffee" in the market of Ukraine showed that the level of potential demand for products and services of "Blue Bottle Coffee" in the market of Ukraine was 45 437 people in 2020, prediction in 2021 –

97 517 people, and in 2022 – 193 001 people, but under the condition that the company will develop and expand points of sale, to carry out an effective marketing communication policy.

It was worth emphasising that "Blue Bottle Coffee" specialises in quality coffee making, so the maximum life of the products produced is 12 hours. This means that products and services cannot be cheap, given the prices for resources and goods in the domestic market. However, according to the results of the attitude of Ukrainians to the "Blue Bottle Coffee" pricing policy, in the next years, potential consumers will become acquainted with the activity of "Blue Bottle Coffee" in the Ukrainian market, will be convinced of the feasibility of their activity and will adopt the pricing policy of the enterprise, inclining to advantages of "Blue Bottle Coffee" activity in the Ukrainian market than the disadvantages.

6. Conclusion

The last stage of the study was to evaluate the economic feasibility of promoting "Blue Bottle Coffee" in the Ukrainian market, which showed that the process of promoting "Blue Bottle Coffee" to the Ukrainian market is quite time-consuming. The largest share is the cost of construction of retail outlets and advertising in retail outlets. Marketing and internet and print advertising costs are the least needed. The total cost of promoting "Blue Bottle Coffee" in the Ukrainian market was 5904.05 thousand UAH in 2020, and this figure will increase over the years.

Based on the calculations of the investment profitability of the product, the following conclusions could be drawn: 1) the project is expedient for implementation by the present value index; 2) by the criterion of profitability, the project should appear effective, this figure is 27,691%; 3) payback period is almost 2 years; 4) an internal rate of return allowed us to determine a break-even threshold (*Cd*) at which Net present value (*NPV*) would be 0. Thus, the project is appropriate for implementation.

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SUMMARIES

Georgy Chankov
Nikolay Hinov

THE ENERGY STRATEGY AND ENERGY POLICY OF THE EUROPEAN UNION

Energy integration is considered to play a key role in the successful development of the European Union. It is assumed that purely market-based mechanisms in this sector, according to the neo-liberal model, can secure a constant supply at low prices. This is the basis of the Union's energy policy, launched by the European Commission (EC). The main goal of this paper is to examine the adequacy of this model and the extent to which the energy policy succeeds in achieving its objectives. There is a difficult combination of technological, economic and political factors expressed in the Union's energy mix. In particular, the document examines the gap between neo-liberal free-market postulates and the practices of modern protectionism, assessing the sustainability of the EU's energy strategy and policy, which often avoid taking efficiency into account. Significant attention is paid to the link between energy and national security, as well as the politically justified intervention of the European Commission in energy projects related to energy supplies for the whole Union. Our research is based on statistics for a long period of time, allowing a comparison between stated intentions and achieved results. Our results stress on the direct link between energy, foreign policy and national security. This link, the cause of the unsatisfactory results, casts doubt on the full integration of the industry and contradicts the views of the Commission.
Keywords: energy strategy; energy efficiency; "Green Deal"; European Commission; common energy policy; electricity market; nuclear energy, neoliberal model; protectionism
JEL: F52; Q42

Bilgehan Tekin

MODELING THE RELATION OF FINANCIAL INTEGRATION-ECONOMIC GROWTH WITH GMM AND QR METHODS

Although international financial integration is an essential topic in economics and finance disciplines, researchers do not have a clear consensus on the relationship between financial integration and economic growth. The main reason for this situation is that financial integration can be heterogeneous and may differ according to the countries' income levels. On the other hand, most studies on the subject have accepted that financial integration has a homogeneous effect on growth by using a sample of countries with a heterogeneous structure. In this study, unlike traditional methods, the generalized method of moments and quantile regression analysis allows a comparison according to the countries' income levels, used together. Fifty-two countries were taken as a basis for the 2000-2019 period. The effect of financial integration and control variables on economic growth was tried to be measured. As a result of the study, direct foreign capital investments, portfolio investments, and current account balance have positive and significant effects on economic growth, and the effects of direct foreign capital and portfolio investments, current account balance, and inflation on economic growth differ between countries with high and low-income levels.
Keywords: Financial Integration; Economic Growth; GMM, Quantile Regression
JEL: F15; F36; F43

Pavlo Kerimov
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QUASI-RISK AND FRAUDULENT FINANCING MODELS: THE CASE OF FIRMS WITH NEGATIVE EQUITY IN UKRAINE

In this paper, we aim to explore and explain the rise in the number and magnitude of negative balance equity (NBE) cases in Ukraine over the last decade. We systematize existing approaches to interpret NBE and scrutinize the interrelation between zombie firms and firms with NBE. We use an original database of 212 big Ukrainian firms to study basic dynamics of the number, volume and longevity of NBE cases in 2006-2019. Our findings indicate that a sufficiently large share of Ukrainian NBE cases does not appear to fully adhere to any of the existing hypotheses, and their number and longevity tend to be abnormally high. We offer two possible explanations for such a phenomenon. The first is a quasi-risk financing model, based on substituting equity with debt financing from associated firms usually registered in tax heavens. The second one is a fraudulent financing model, based on the exploitation of legal and political backing discrepancy between debtor and creditor. The use of said models is indicated by positive operational cash flow in conjunction with the continued business activity of NBE firms that otherwise qualify for bankruptcy. We suggest the Value Gap Ratio as a rule of thumb indication of these financing models being used.
Keywords: corporate finance; capital structure; net equity; bankruptcy; zombie firms
JEL: G32; G33

Charbel El Ammar

TALENT MANAGEMENT PHILOSOPHY IN PUBLIC SECTOR: A KEY FOR MANAGING CONFLICTS AND CONTRADICTIONS

Nowadays, economic globalisation has developed an increasingly challenging and competitive market environment that many firms should adapt to perform adequately in order to ensure profitability, sustainability, and economic development. Workers across the globe are becoming bigger, diversified, further cultured, and dynamic. A substantial existing proof demonstrates that firms around the world experience a powerful challenging situation concerning talent. Attracting, developing, and keeping highly talent individual is considered critical in private and public sector. These sectors are faced with condensing talent competitiveness between each other. Yet, talent management is an understudied area of discussion in public organisations. The objective of this article is to define and describe talent management based on a public sector framework through placing it within the human resource management system and relating it to developments, improvements, and trends of the public sector. This paper employs a comprehensive approach for talent management drawing on experiences based on public management and administration, and human resource management. Firstly, this paper identifies features and improvements related to the public industry. Second, it describes and defines talent and talent management from public perspectives focusing on recent studies and publications; it analyses talent management major problems, internal and external influences, conflicts, and contradictions in the public sector. Lastly, this paper recommends a potential road map for the research and discussion of talent management in the public industry and raise several suggestions for future studies.
Keywords: Public Sector; Public Administration; Talent Management; Public Management; Human Resource Management
JEL: H83; M12; O15

Dimiter Nenkov

THE S&P 500 CURRENT RECORD-HIGH LEVELS AGAINST FUNDAMENTAL PE AND PBV RATIOS

The subject of this research is the performance of the S&P 500 index during the last decade, including in the context of the 2020 Covid pandemic. The main issue of interest is whether the index price levels are supported by fundamentals, or there is a bubble on the US stock market. The study is based on the use of the price-earnings ratios (PE) and price-to-book ratios (PBV) of the index during this period. The 2020 PE and PBV of the index are compared with historical market PE and PBV ratios. Another aspect of the analysis also involves fundamental PE and PBV ratios of the S&P 500 index, which are derived from the fundamentals, determining the value of stocks in the index. The results of the analysis do not confirm the validity of the high current PE and PBV ratios and do not justify the high stock price levels of the S&P 500 during most of 2020.
Keywords: stock markets; PE and PBV ratios; fundamentals; stock market bubble
JEL: G11; G12; G15

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INDUSTRIAL AND TRADE POLICY IN AGRICULTURAL ENGINEERING: RUSSIAN SPECIFICS AND PROBLEMS OF HARMONIZATION

The purpose of the study is to develop a methodological approach to quantifying the degree of harmonization of industrial and trade policies in agricultural engineering.

The article analyzes the scientific approaches to the study of the problems of harmonization of industrial and trade policy. The authors reveal the specifics of industrial and trade policy in agricultural engineering in Russia, identify the imbalance between supply and demand in the industry, as well as systematize the main problems that prevent their harmonization. The authors propose a methodological approach to quantifying the degree of harmonization of industrial and trade policies based on the use of mathematical integration tools.

The developed methodology for calculating the integral index of industrial and trade policy harmonization allows us to quantify the degree of industrial and trade policy harmonization in agricultural engineering in order to obtain a generalized characteristic for diagnosing the industry situation and making informed management decisions in terms of eliminating the imbalance between the supply and demand of agricultural machinery. Diagnostics of the development of the industry using the proposed integral index is objective, since the integral index has a managerial value not in absolute terms, but in dynamics.

The practical significance of the study. The authors' recommendations can be used to justify the priority areas of harmonization of industrial and trade policies in agricultural engineering.

Originality/significance. The scientific understanding of the harmonization of industrial and trade policies is expanded by applying the author's approach to its quantitative assessment using the integral index of harmonization. This creates an additional information base for state regulation of the industry.

Research methods: critical analysis of monographic and periodical literature, general scientific research methods, historical and logical analysis, generalization, economic and static methods, system approach.

Bozhidar Hadzhiev

MODERN TRANSFORMATIONS IN THE ECONOMIC ACTIVITY

In today's dynamic, electronic and open market world, the focus is on transformations of policies, strategies, systems, models and mechanisms related to the entrepreneurial and innovation potential of the business for effective management of the changes. This direction requires adequate analyses, assessments and control of the entrepreneurial and innovation potential through the prism of an overall view of the changes providing balanced benefits for the business, as well as for the nature and society. The more and more complex and fast transformations of the business require answers to the following questions:
- What priorities and where should the analysis and control be focused on?
- What is the update of the algorithms and the technologies for analysis and control?

For some answers to these questions, developed and recommended are:
- algorithm of a modern system for analysis and control in four main directions (value qualities of the subject; quality of the situation of current work or future work; quality of work, activity; quality of the result of the activity);
- model for proactive analysis (GS1 system standards are combined with certain QMS standards);
- model for analysis and assessment of the entrepreneurial and innovation potential of the enterprises;
- algorithm of process innovations in the relation "business – circular economy – complex reengineering";
- model of digital infrastructure for the interrelation of the economic entities.

Hrabrin Bachev

MODES OF GOVERNANCE FOR ECOSYSTEM SERVICES IN BULGARIAN FARMS

Despite growing environmental issues and increasing public and private interests, scientific studies on the management of agroecosystem services are at the beginning stage. This article incorporates the interdisciplinary New Institutional Economics framework and identify and assess diverse private, market, collective and public modes of management of ecosystem services applied by the Bulgarian farms. The study has found out that farms of the country maintain or produce a great number of essential ecosystem services, among which provisioning food and feed and conservation of elements of the natural environment prevail. A great variety of private, market, collective and public modes of governance of farm activity related to agroecosystem services have been used. There is significant differentiation of employed managerial forms depending on the type of ecosystem services and specialisation of agricultural holdings. Management of agroecosystem services is associated with a considerable increase in the production and transaction costs of participating farms as well as big socio-economic and environmental effects for holdings and other parties. Factors that mostly stimulate the activity of Bulgarian producers for protection of agroecosystems and their services are participation in public support programs, access to farmers' advice, professional training, available information and innovation, received direct subsidies, personal conviction and satisfaction, positive

experience of others, long-term and immediate benefits for the farm, and integration with suppliers, buyers and processors. A suggested holistic framework for analysing the system of management of agroecosystem services is to be extended and improved and widely and periodically applied in the future.

Keywords: ecosystem services; modes of management; Bulgarian farms

JEL: O13; Q12; Q13; Q15

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THE INFLUENCE OF UNCERTAINTY ON MARKET EFFICIENCY: EVIDENCE FROM SELECTED EUROPEAN FINANCIAL MARKETS

The purpose of this study is to determine if the capital markets of fourteen European countries are efficient or not. Additionally, we examine the impact of VIX and GEPU returns on the market efficiency of the analyzed capital markets. We apply the Augmented Dickey-Fuller (ADF) test and Threshold GARCH (TGARCH) Model. The period under examination is 2003-2016. Our results show that the explored European markets are highly integrated, and in the context of the Efficient Market Hypothesis (EMH), a division along the line of the developed-developing market has been revealed. The Bulgarian capital market shows a strong degree of integration with the other explored economies in the conditions of EMH. The efficiency of the explored markets is improved by adding to the model VIX and GEPU returns. We prove that diversification can be achieved based on emerging markets of the EU Member States. Prolonged periods of low volatility can further reduce correlations, encouraging further risk-taking.

Keywords: Efficient Market Hypothesis; VIX; GEPU; capital markets volatility; financial crisis

JEL: C22; G01; G14; G15; G32

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ASSESSMENT OF THE COVID-19 PANDEMIC IMPACT ON PEOPLE'S LIVES IN NORTH MACEDONIA

Within the paper, an analysis of the situation in North Macedonia caused by the emergence of the new coronavirus (SARS-CoV2) was performed. The first part of the analysis is based on the official statistics in the country related to the occurrence of the infection and the intensity of its spread, number of infected cases, number of deaths, etc. The second part of the analysis is based on the results of our own survey conducted in order to obtain additional information to assess the impact of the pandemic on human lives in the country. The questionnaires used as an instrument for data collection were distributed electronically to the respondents (adult population). The data collection period was one week (from 15 to 21 May, 2020). The survey was responded by 313 participants. The survey results give us a more comprehensive picture about the situation in the country, referring to: the familiarity of the population with the coronavirus and with the potential health and economic implications from the virus; the impact of the new situation on the people's lives and on the daily habits; the pandemic impact on employment and income; the population risk perception regarding the COVID-19 infection and regarding their personal concerns about the uncertain future.

Keywords: COVID-19; survey; economic and social implications

JEL: D01; I18; J64

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MEASURES TO MITIGATE RISKS FOR VIETNAMESE ENTERPRISES EXPORTING GOODS TO ASEAN MARKETS

With the advantage of being an economically dynamic and geographically close region, Vietnam – ASEAN trade relations have had high growth rates in recent decades. This has helped open new opportunities for Vietnamese exporters to get access to and expand its markets internally in a region of about 625 million population and larger external markets, as well as to get deeper engagement in the global value chain. However, the export of Vietnamese goods to these countries is always unpredictable and highly risky. Potential risks come from the policy of the states, from the parties and exporters involved, from the protection of domestic trade, from the customs and practices of the consumers. This has been especially true since the ASEAN Economic Community is officially established by the end of 2015. Risk identification is an important step to minimize and prevent risk and vulnerability in export activities for Vietnamese exporters while integrating into the region. By using a systematic, multi-dimensional approach, the paper uses a combination of quantitative and qualitative research methodologies to identify the risks for Vietnamese exports to the ASEAN market, which is based on data of export status and studies about the actual situation of exporters. At the same time, on the basis of the development orientation between Vietnam and AEC, the article is to provide solutions to reduce risks that are applicable for the state and industrial communities, thereby improving the efficiency of Vietnamese exports to the ASEAN markets.
Keywords: Vietnam; ASEAN; export; import; measures; risk; mitigate; trade
JEL: O01

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ANALYSIS OF THE SELECTED ENTRY STRATEGY OF BLUE BOTTLE COFFEE ROASTER

The article is relevant because the coffee market is one of the most profitable and e-commerce brands. The paper aims to study the theoretical foundations of developing a strategy for promoting a foreign company to the domestic market and to develop practical recommendations for the promotion of "Blue Bottle Coffee" in the coffee market in Ukraine. The methodology of the article is based on a few stages of implementation of marketing strategy. According to the results of the research, the level of potential demand for products and services of "Blue Bottle Coffee" in the Ukrainian market will increase in 2021-2022, but under the condition that the company will develop and expand points of sale, to carry out an effective marketing communication policy. In the next 3 years, potential consumers will become acquainted with the activity of "Blue Bottle Coffee" in the Ukrainian market. However, neither a perfect commodity policy nor a well-balanced pricing policy and a well-chosen distribution system will not be able to provide the appropriate economic result to production and marketing enterprises without an effective system of implementation of promotion strategies.
Keywords: marketing strategies; SWOT analysis; international companies; coffee market; enterprise; consumer; product; price
JEL: D24; D47; M31; P42