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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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Irena Zareva[1]

HUMAN CAPITAL FORMATION IN BULGARIA – LESSONS FROM THE PANDEMIC[2]

The COVID-19 pandemic changed substantially economic and social life globally, causing both a health crisis and a deep recession. It had a significant negative impact on the formation of human capital in both quantitative and qualitative terms and highlighted a number of problems in this area. The purpose of the present study is to highlight and systematise more important effects of the pandemic on the formation of human capital in Bulgaria and to direct attention to problem areas that are a starting point for the development of policies and measures to improve the formation, preservation and development of human capital in the country.
Keywords: human capital; COVID-19
JEL: I20; J11; O15

At the beginning of March 2020, the World Health Organization announced a COVID-19 pandemic. The pandemic is a global challenge that has drastically changed economic and social life globally and led to the world's deepest recession in eighty years, "almost three times deeper than the global recession of 2009." (World Bank Group, 2020, p. 3). What is unprecedented in this case is that "at the heart of the recession is the vulnerability of the human factor" (ERI-BAS, 2020). The pandemic situation created both a health and economic crisis, and in 2022 the geopolitical and geoeconomic situation became even more complicated.

As a result of the pandemic, the death rate rose significantly. The lockdown considerably limited access to health and education services. The business could not operate normally. Supply chains were almost cut off, as was the movement of people. The global economy fell into recession, economic growth declined sharply, employment decreased, unemployment rose, and poverty and inequality increased.

Bulgaria is no exception. According to NSI data, in 2020 the real GDP of the country registered a sharp drop of 4.4%, and the increase of 4.2% in 2021 could not compensate for it. In the following years, the growth rate has slowed down. The forecasts are also not very favourable. For example, according to the macroeconomic forecast of the Economic Research Institute at the Bulgarian Academy of Sciences (ERI-BAS, 2024) real GDP growth

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will be slightly over 2% in 2024, i.e. below potential growth, with a gradual recovery to pre-pandemic average levels expected by 2026. The number of employed people significantly decreased, with 2020 being characterised by a substantial drop of 3.6%, and the decrease continued in 2021, although not so considerably (-1.2%).

Various studies highlight the negative consequences of the COVID-19 pandemic on human capital. According to a study from 2022 „Quantifying the macroeconomic impact of COVID-19-related school closures through the human capital channel" (de la Maisonneuve, C., B. Égert and D. Turner, 2022) prolonged school closures can have long-lasting effects on human capital, productivity and per capita income. „The effects of school closures may increase over time and result in a loss of between 0.2% and 0.9% of human capital by the time all affected cohorts will have entered the labour force between 2036 and 2067… These human capital losses will in turn lead to lower productivity by about 0.4% to 2.1% in 2067… School closures will also have an impact on students' mental health and social capital, which would affect productivity and well-being." The paper concludes that this problem is important not only because of the direct economic effects, but also because such losses could have consequences for future generations when the current ones become parents.

Similar conclusions are drawn from a study from 2023 „COLLAPSE and RECOVERY. How the COVID-19 Pandemic Eroded Human Capital and What to Do about It" (Schady, Norbert, Alaka Holla, Shwetlena Sabarwal, Joana Silva, and Andres Yi Chang, 2023), which emphasises that human capital losses not only affect individuals by reducing their future earnings, but have negative consequences for the entire economy. Any interruption in the process of building human capital can have long-lasting effects, with evidence from earlier crises showing that the effects of shocks on human capital can have repercussions on a number of generations, as well as lead to a sharp increase in inequality in the future.

The pandemic has had a direct and significant impact on human capital globally and nationally. The effects can be traced in different directions – a sharp intensification of the continuous gradual decrease in the number of the population in the country, significant increase in mortality, loss of human lives and deterioration of health of both elderly and younger groups of the populations, which, together with the existing demographic crisis in Bulgaria, leads to an even greater reduction of the bearers of human capital; limitation of access and worsening of the quality and outcomes of education and training, i.e. an effect on both the bearer and the formation, accumulation and quality of human capital. The pandemic had an impact on and changed the external migration processes, on which human capital in the country also depends.

The pandemic had a negative influence on people's health, on the one hand, and on their education, on the other. The formation of human capital takes place mainly in the system of education as well as in the system of training.[3]

In an effort to limit the spread of COVID-19, many countries have fully or partially closed educational institutions and switched to distance learning without the possibility of prior preparation. In mid-March 2020, distance learning was also introduced in schools in

[3] The health care system is not a subject of research here.

Bulgaria.[4] The closure of educational institutions had an impact on the access and the quality of education, as well as on the psychological state of the students, while at the same time stimulating innovation in the education sector. A number of investigations confirm that it also exacerbates educational inequalities.

The results of the PISA 2022 show significant educational inequalities in Bulgaria. The share of students from vulnerable social groups achieving high reading scores is one of the lowest among the countries included in the study (6%).

Along with limiting access to education under the influence of the pandemic situation, the participation of the population in lifelong learning has also decreased. Lifelong learning is an important element of the system for developing and improving the quality of human capital.

At the same time, the crises, related to the pandemic, caused an acceleration of the processes started before and related to increasing the role of the knowledge economy and the need to increase investments in human capital, fundamental science, education and training, and to acceleration of the development of digital technologies and skills.

The purpose of the present study is to highlight and systematise more important effects of the pandemic on the formation of human capital in Bulgaria, which direct attention to problem areas, as well as to opportunities and ways for its development. The study is based on official statistics and secondary analysis of empirical studies in the country during that period.

Demographic Effects

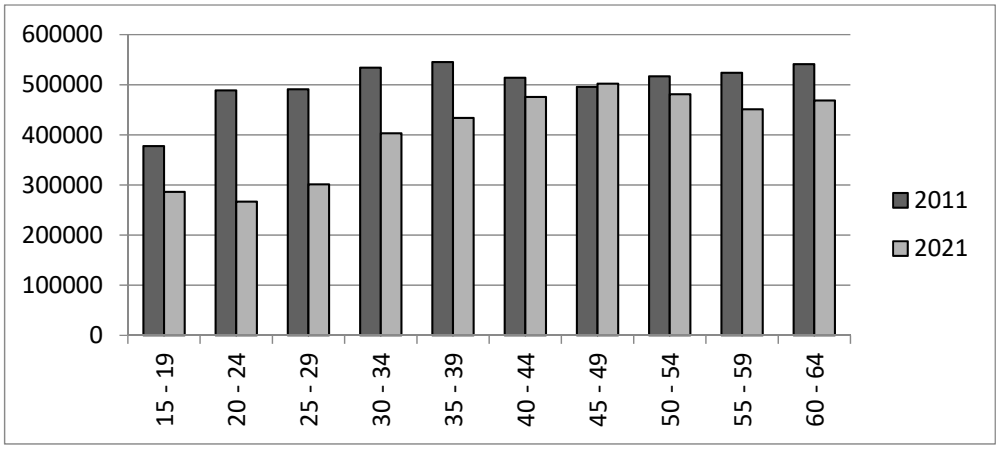
Bulgaria's population has been declining for decades[5], and this trend has intensified significantly during the years of the pandemic. According to data from the 2021 census, its number has reached 6 519 789 persons, or 844 781 persons less compared to the previous census of 2011. If before the COVID-19 pandemic, the population of Bulgaria decreased by about 40-50 thousand persons per year, only in 2021 compared to 2020 the reduction is by more than 77 thousand persons.

The age structure of the population is also deteriorating significantly. The number of persons under 40 (economically active and of reproductive age) is significantly lower in 2021 than that in 2011. The most unfavourable is the change in the age group 20-29 (Figure 1).

[4] On 16.03.2020 the Ministry of Education and Science introduced distance learning, and kindergartens and schools were closed.

[5] According to the National Statistical Institute forecast, the population of Bulgaria will continue to decline steadily in the long run.

Figure 1. Population by age group (number)



Source: National Statistical Institute, Population Census

The alteration in the number of the population is largely determined by the negative natural increase. Natural increase in the country has been steadily declining, but fell sharply during the pandemic, much more significantly than the EU-27 average. There is no lower natural increase in the EU than in Bulgaria. Nearest to Bulgaria (-13.1 for 2021 and -9.6 for 2022) is Latvia with -7.9, followed by Lithuania with -7.4 for 2022. In the absence of sharp changes in the continuously and smoothly decreasing birth rate[6], which in 2022 reaches 8.8 in Bulgaria, the sharp drop in the natural increase is due to a significant rise in the death rate in the country (Table 1).

Table 1. Population and natural increase per 1000 persons of the population

	2010	2015	2018	2019	2020	2021	2022
Population of Bulgaria as of 31.12. (number)*							
	7504868	7153784	7000039	6951482	6916548	6838937	6447710
Natural increase per 1000 persons of the population**							
Bulgaria	-4.7	-6.2	-6.6	-6.7	-9.5	-13.1	-9.6
EU-27	0.6	-0.7	-1	-1.1	-2.5	-2.7	-2.8

* According to National Statistical Institute data, current statistics (as of 17.02.2024)
** According to Eurostat data (as of 17.02.2024)

The mortality rate in Bulgaria is almost twice as high as the EU-27 average level, which is determined not only by the impact of the COVID-19 pandemic. The death rate is constantly growing in the country, but under the influence of COVID-19, it rises sharply in 2020 and 2021 (Table 2). There is no higher mortality rate in the EU-27. Closest to Bulgaria is Latvia with 16.4, followed by Lithuania with 15.1 for 2022.

[6] A certain increase in the birth rate was observed in the period 2000-2009 from 9.0‰ to 10.7‰, after which it started to decrease again. This rate is lowest in 2020 and 2021, when it drops to 8.5‰.

Table 2. Mortality per 1000 persons of the population

	2010	2015	2018	2019	2020	2021	2022
Bulgaria	14.9	15.3	15.4	15.5	18	21.7	18.4
EU-27	9.9	10.4	10.5	10.4	11.6	11.9	11.5

Source: Eurostat (as of 17.02.2024)

The number of deaths increased significantly during the pandemic from about 110 000 in the period 2010-2019 to 124 735 in 2020 and 148 995 in 2021 (Table 3), decreasing to 118 814 in 2022. However, this jump is both a consequence of the Coronavirus itself and its complications, as well as of the restriction of access to health services, the reduction in visits to health professionals and in the treatment of the chronically ill and persons with other serious illnesses.

Table 3. Deaths from COVID-19 in Bulgaria – overall and by age groups

Age groups	Number	Relative share of all deaths in age group	Number	Relative share of all deaths in age group	Number	Relative share of all deaths in age group
	2020		2021		2022	
Total	8554	6,9	27588	18,5	8993	7.6
10-14	2	3,0	4	6,3	1	1.6
15-19	7	5,6	11	7,6	2	1.6
20-24	6	3,1	27	11,1	4	2.3
25-29	10	4,1	57	16,5	10	4.2
30-34	34	7,3	108	18,2	17	4.2
35-39	60	7,3	180	18,7	40	5.1
40-44	124	8,2	363	21,2	67	5.0
45-49	206	8,1	608	20,1	105	4.6
50-54	328	8,6	962	20,4	170	4.7
55-59	594	9,7	1397	19,9	323	6.2
60-64	990	10,7	2475	22,6	570	6.9
65-69	1281	10,0	3761	24,1	964	8.2
70-74	1625	9,3	5333	24,4	1559	9.5

Source: National Statistical Institute.

Nearly a quarter of all deaths in the country in 2021 are due to COVID-19. Over 27.5 thousand people died from it. It hit not only the older generations, but also the under- and working-age population, in other words, the bearers of human capital and those forming human capital (mainly children and young people), which are of primary importance for the future – both for the development of society and the economy.

Changes in population size are determined by alterations in both natural and migration increases. The pandemic and restrictions on the movement of people have also seriously affected external migration (Table 4), with migration processes considerably limited, although temporarily. Negative migration increase has been characteristic of Bulgaria for more than ten years. The number of persons settled in the country is growing, a trend that has been more clearly defined since 2016, but accelerated during the pandemic. The number of emigrants is greater than that of immigrants, characterized by an increasing trend in the last

10 years. In 2020, however, it dropped significantly (about 6 times) from 39 941 in 2019 to 6 649 in 2020, but in 2021 it rises again to 26 755 persons, approaching that of the pre-pandemic period. In the midst of the health crisis, the number of emigrants decreased drastically, as a result of which the migration increase of the population went from negative to positive and exceeded 30 000 persons in 2020. In 2021, with the loosening of anti-epidemic measures worldwide, the process of emigration from the country intensified again, and the migration increase notably declined, although it still remains positive.

Table 4. External migration – migration increase (number)

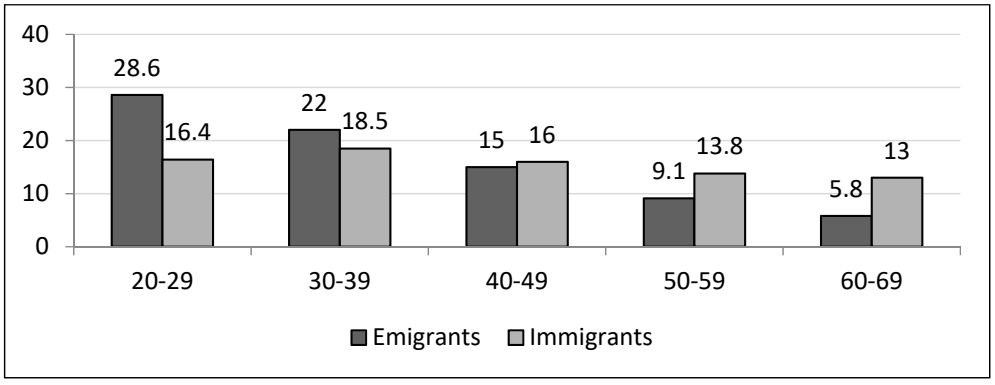
	2015	2018	2019	2020	2021	2022
Migration increase	-4247	-3666	-2012	30715	12706	27444
Immigrants with Bulgarian citizenship	10722	16169	23555	24007	22087	19032
Emigrants with Bulgarian citizenship	24487	31263	37931	3658	24442	11972

Source: National Statistical Institute (as of 24.02.2024).

It should be emphasised that the number of immigrants with Bulgarian citizenship (Bulgarian citizens who have returned to the country) has shown an increasing trend in recent years, and during the pandemic, due to the travel ban, its change is not very considerable (2020 compared to 2019), and in 2022 it declines. However, a drastic decrease was observed in the number of emigrants with Bulgarian citizenship (which is also characterised by an increasing trend) in 2020, after which it started to grow again. According to data from the 2021 population census, the largest number of Bulgarian citizens returned to the country in 2020 and 2021 – 49 377 persons. In other words, the lockdown during the pandemic significantly affected the emigration processes of the Bulgarian population, but only for a short time.

Current statistics from the National Statistical Institute show that in 2021 and 2022 about two-thirds of emigrants are aged 20-49, while among immigrants this age group makes up 50% (Figure 2). The emigration of the population of this age group cannot be compensated by immigration, which in turn contributes even more to the reduction of the country's human resources, especially in its most productive and reproductive age.

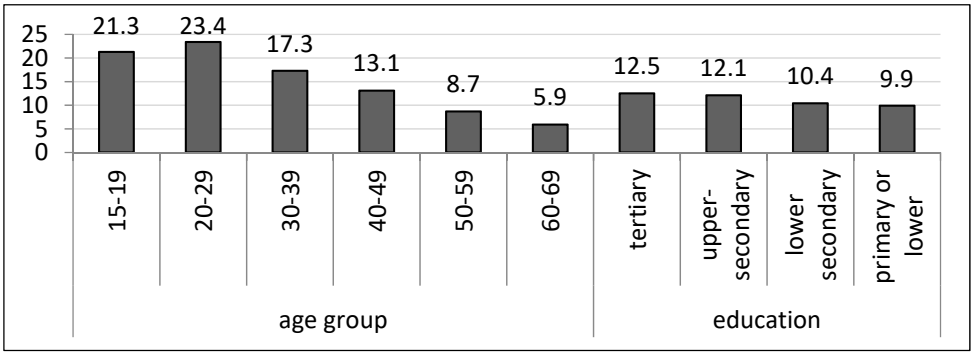
Figure 2. External migration by age groups (%), 2021



Source: National Statistical Institute.

According to the sample study of migration and migratory behaviour of the population accompanying Census 2021, the share of potential migrants increased compared to 2011 in all age groups, with 11.9% of persons aged 15-74 very or somewhat likely to move to live abroad. Potential migrants are mainly persons from the younger age groups. The realisation of their intentions would have an impact both on the available human capital in the country at the time of their emigration and in the future, as it would also lead to a decrease in the fertility quotas and the birth rate in Bulgaria. A no less unfavourable phenomenon is the larger share of highly educated persons – potential emigrants compared to the less educated, which would also affect the quality of human capital in the country (Figure 3).

Figure 3. Potential emigrants by age groups and by education, 2021 (%)



Source: National Statistical Institute, Migration and migration behaviour (Sample survey accompanying Census 2021).

The results of a migration survey by the "TUK-TAM" association[7] (a global online network) on the attitudes of Bulgarians around the world, conducted at the end of 2021[8] among Bulgarians living abroad or who returned to Bulgaria in the last two years (during the pandemic) show that the majority of respondents do not plan to change their place of residence, especially those over 36 years old. Young people aged 18-24 who are studying and have not permanently settled abroad are more likely to go back to the country. Intentions to return are rather long-term (after 5-6 years), while in the short term one-third of those living abroad plan to get back. The main reasons for the return of those living in Bulgaria under two years are their relatives and the COVID-19 pandemic.

As a consequence of the outlined processes in the natural and migration increase of the population, its number drops significantly.[9] The change is extremely unfavourable for the

[7] Association of Bulgarians with experience and education abroad.
[8] The survey was conducted among persons aged 18 and over, with 2 329 interviews carried out in the period November-December 2021, https://tuk-tam.bg/migration/results.
[9] The country's labour force is also decreasing – significantly and continuously, including during the pandemic period, from 3447.9 thousand persons in 2007 to 2965.4 thousand in 2022 according to National Statistical Institute data (https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=828). Analysis of the influence of COVOD-19 on the Bulgarian labour force is done by Borissova-Marinova, 2023.

lower age groups and especially for those under 40 years of age (this is the population of reproductive age, and also a large part of the economically active population of the country), the decrease in the number of whom is greater than that of the age groups over 55 years. Such a change, with a non-increasing birth rate in the country, conditions a long future period of population reduction, i.e. of the bearers of human capital. According to National Statistical Institute forecasts, the country's population will decrease continuously in the long term, and in about fifty years its number is expected to fall below five million people.

The pandemic had a significant impact on the population of Bulgaria by sharply deepening the negative demographic processes in the country – it led to a considerable increase in the mortality rate, which, with the constantly decreasing birth rate, predetermined a drastic decline in the natural increase of the population. At the same time, the positive changes in the migration increase were short-term. The migration attitudes of Bulgarians living in the country and abroad are not changing in a positive direction. In other words, the effect of the pandemic situation on the bearers of human capital was extremely unfavourable, and a large part of its consequences are long-term.

Education/Quality Effects

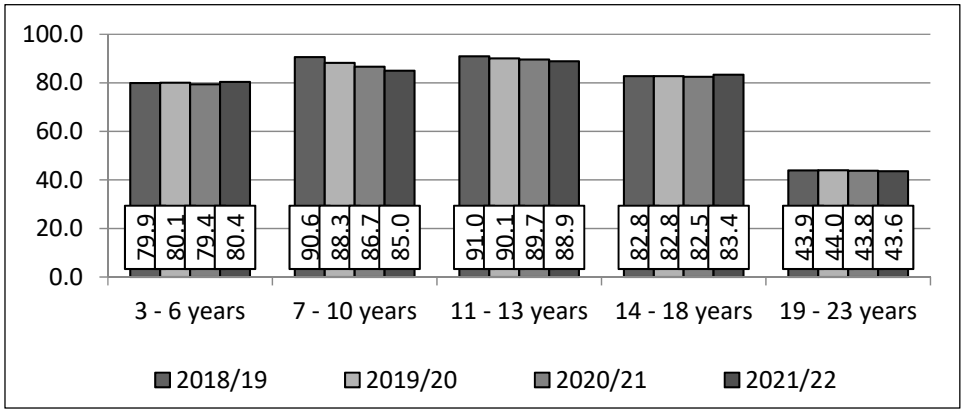
The pandemic has had a direct impact on human capital, worsening the health status of the population and taking lives, but also in a qualitative aspect, affecting education and training processes by limiting access and worsening the quality of education and learning outcomes due to the closure of educational institutions and problems with distance learning, especially for poorer groups of the population and in smaller settlements, largely due to limited access to the internet and information technology.

At the beginning of 2020, in the conditions of a rapidly growing pandemic, it came to the closure of kindergartens and educational institutions and the transition to distance learning from home. However, there was no prior preparation for this. Both teachers[10] and students were unprepared.

As a result of this drastic change, the participation of some students in the educational process was limited. The net enrolment rate of the population in primary education, for example, marked a significant decrease, although not only during the pandemic period, reaching 83.6% for the academic year 2021/2022. By age group, a continuous decline is observed for children aged 7-10 and 11-13. During the pandemic, the rate for the age group 19-23 also decreased (Figure 4).

[10] According to National Statistical Institute data, half of the teaching staff in general education and vocational schools is over fifty years old. For the academic year 2022/2023, 14% of the teaching staff in general education schools is aged 60 and over, and 18% in professional schools (NSI, 2023).

Figure 4. Net enrolment rates of the population in the education system by age group (%)



Source: National Statistical Institute.

Distance learning has also highlighted some significant problems related to the quality of education, the perception of learning material, physical activity, social isolation and the psychological consequences for learners. The most affected were the vulnerable groups of children. The results of a number of studies have shown that a major problem for these learners is the lack of electronic devices and the Internet. Not a small share of students did not participate in distance learning or did not participate regularly. A large share of students claim that they had worse academic results than before, and that class attendance has not been insufficiently monitored.

In 2020, a Global Metrics survey was conducted on the opinion of Bulgarian students from fifth to twelfth grades on the implementation of distance learning "Assessment of the impact of COVID-19 on preschool and school education in Bulgaria – students' point of view". According to its results, 3.5% of students did not have a stationary computer, tablet, laptop or mobile phone at home, which means that at that moment they were not covered by the education system. Particularly affected in this regard are children of Roma origin, those with parents with a low level of education, as well as from small settlements. The data shows that 8.5% of students participated in some form of distance learning, but not regularly, and just under 3% did not participate in any form of learning (p. 9). The main reasons why part of the students did not participate in distance learning are lack of access to the internet, inability to buy the necessary equipment, and according to 23% – "remote classes are boring" (p. 19). In addition, nearly a third (over 28%) of the surveyed students say that their teachers "do not cope well with remote work", and according to a fifth – "teachers do not monitor attendance in class". As a result of these, as well as a number of other problems related to insufficiently well-prepared distance learning, for 28.7% of learners "online learning is just standing in front of a computer", 27.3% of the respondents "now understand less of the taught material" (p. 28), 21.6% claim that they have lost all desire to study, and 19.3% – that they perform worse than before.

A study by the Institute for Education Research "Analysis of the consequences for the learning process, students and teachers of distance learning in an electronic environment in the academic year 2020/2021" (Hristova, Petrova, Tosheva, 2021) conducted among students of grades V to XII and their teachers in June 2021 (a sample of 200 schools), largely confirms the results of the Global Metrics survey and provides insight into the problems with distance learning and its quality during the pandemic.

A significant share of teachers do not have sufficient experience in distance learning. The research shows that every second teacher has more than 5 years of experience using digital technologies in their work, about 43% of teachers with more than 20 years of experience have used such technologies for less than 5 years, and nearly 6% have not used them at all before distance learning. Teachers in villages have significantly more limited experience in the use of such technologies, with about 2.3% of them having not conducted training in an electronic environment in the academic year 2020/2021. About half of the teachers consider that their students need additional help to assimilate the learning material in an electronic environment, i.e. significant "targeted pedagogical support for students to assimilate the learning material in distance learning in an electronic environment is needed, especially at the primary stage and in schools located in rural areas" (p. 46). At the same time, a third of the teachers do not feel that they are sufficiently capable of establishing an appropriate e-learning climate that includes, stimulates and engages students in learning, as well as monitoring student progress, identifying and responding appropriately to emerging learning difficulties (p. 69).

According to the teachers, the main problems facing distance learning are related to: "students' access to quality internet and electronic devices, their motivation and commitment to learning, ensuring the regular presence of some students in online classes and their insufficient digital skills" (p. 52). Despite some observed improvement, regularly missing classes is a serious problem, creating a risk of dropping out of school. According to half of the teachers, some of the students were often not fully present in online classes, and every third had students who were regularly absent from classes (p. 76). Every second teacher reports a deterioration in the motivation and engagement of their students, and 40% – in the knowledge of students in the subject area in which they teach. A positive effect of learning in an electronic environment is the improvement of students' skills to work with digital technologies.

The results of the research show a high degree of provision of students with electronic devices and access to the internet for home learning, although there are significant differences in resource provision according to the type of electronic devices, mother tongue, educational level of parents, type of settlement where the school is located, which creates conditions for deepening educational inequalities, increasing the risk of dropping out of school and worsening the results and effectiveness of learning.[11]

[11] According to data from a previous study by the Institute for Educational Research, conducted at the end of the 2019/2020 school year, the share of parents who do not indicate the presence of their own electronic devices for educational purposes amounts to 16% in cities, while in villages it reaches 30%. The differentiation is similar according to the language spoken in the family – Bulgarian, Romani, Turkish, another. Over 50% of parents with less than primary education claim that they do not have an

In terms of students' assessment of their e-learning, a fifth of them give a low self-assessment of their digital skills, mainly those from vulnerable groups. Of particular concern for the educational process and its quality is the fact that the share of students who participated relatively regularly in classes (every day or most days) is declining – from 88% in 2020 to 79% in 2021, and the students who participated in the learning process every day decreased most significantly (p. 100). Along with this, there is a "decrease in students' emotional, behavioural, cognitive and metacognitive engagement; their approaches to learning; their self-management skills in learning contexts and their self-assessment of their learning abilities in 2021 compared to 2020 data, and a significant increase in the share of students with low engagement and self-assessment of learning abilities" (p. 112). One in four students find it difficult to learn in an electronic environment and believe that they did not do very well, with around 17% stating that they did not manage to absorb the learning material well (p. 137).

The pandemic has had a significant impact on the schooling of learners by deteriorating its quality, which may have long-term negative consequences for the country's human capital. The results of the latest PISA 2022 study, which is conducted among students aged 15 and covers the areas of mathematics, reading and natural sciences, are indicative in this regard. They show that Bulgaria ranks last in mathematics in the EU and second to last in reading, and the results are significantly lower than in the previous years of the study. The average score of students in mathematics is 417 (OECD average of 472) against 436 in 2018, in reading it is 404 (OECD average of 476) against 420 in 2018 and in science – 421 (485 on average for the OECD) against 424 in 2018. Fifty-four percent of the Bulgarian students have a result lower than the basic score for mathematics skills, 53% for reading and 48% for natural sciences (Table 5).

Table 5. Results of the Bulgarian students according to PISA (score)

	Mathematics	Reading	Science
PISA 2012	439	436	446
PISA 2015	441	432	446
PISA 2018	436	420	424
PISA 2022	417	404	421

Source: PISA 2022.

It is true, of course, that student results started to deteriorate much earlier, since the 2015 study, which shows that the problems of education in Bulgaria are much deeper, but those caused by the pandemic, further strengthened the negative trend.

The situation is slightly different in the field of higher education, where young people with already acquired certain knowledge, relatively better digital skills and, due to the age group,

electronic device for learning purposes and no internet at home, and less than 30% of children from such families have participated in distance learning in an electronic environment every school day. Based on the results of the research, a forecast was also made for the impact of the pandemic on learning in the country, according to which the share of functionally illiterate students will increase by 7 pp. in the post-COVID period compared to the last PISA survey of 2018, from 47% to 54% respectively (For details see Hristova, 2021).

with a supposedly higher degree of responsibility towards the educational process and of concentration are trained. According to the results of a survey conducted in the period April-June 2020 among nearly 25 000 Bulgarian students for the purposes of the Rating System of Higher Schools in Bulgaria,[12] 19% of respondents believed that their professors did not conduct lectures and exercises regularly, and 17% declared that the students themselves were not regular in the online classes. Between 14 and 21% of students participating in this form of education express dissatisfaction with online learning. In addition, 3.8% claimed that there was no online learning in their specialty, although face-to-face classes were interrupted.

Human capital is formed, of course, mainly in the education system, but also in the training system. Gaps in schooling during the pandemic are likely to have to be compensated at a later stage in the training system. However, the share of the population aged 25-64 in education and training in Bulgaria is almost insignificant and without any notable trend of growth in the last 10 years – from 1.7% in 2012 to 1.8% in 2021, with a multiple times higher average EU-27 rate, amounting to 10.8% in 2021 and characterised by a continuous upward trend from 8.2% in 2012. Bulgaria is in the last place in the EU in terms of this indicator, with Greece coming closest with 3.5% in 2021. The pandemic had an impact on this process as well, and in 2020, the year of the lockdown, the rate decreased by 0.6 pp. (Table 6). The participation of the population in education and training decreased in general in the EU in 2020, including in Bulgaria, where it again remained with the lowest share.

Table 6. Participation rate of the population aged 25-64 in education and training (%)

	2012	2015	2018	2019	2020	2021	2022
Bulgaria	1.7	2	2.5	2	1.6	1.8	1.7
EU-27	8.2	10.1	10.6	10.8	9.1	10.8	11.9

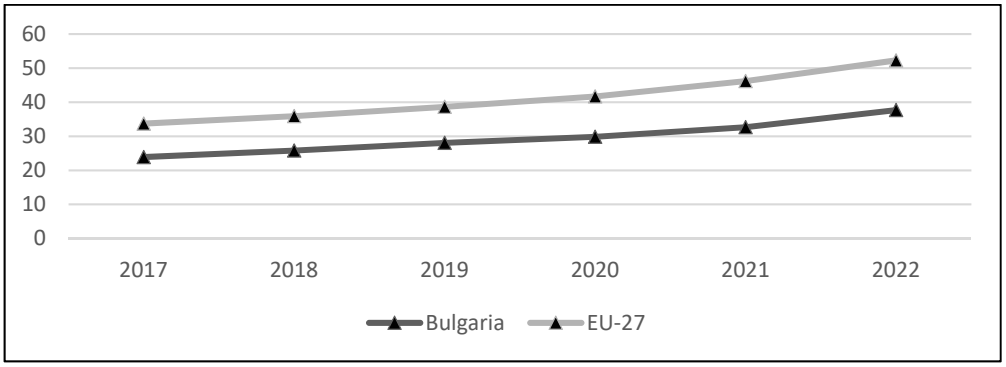
Source: Eurostat (as of 24.02.2024).

The pandemic has had a significant negative impact on access to and quality of education and training, i.e. on the formation of human capital in the country and its quality. However, it also had a positive effect – it has stimulated digitalisation and the development of digital skills of the population.

An idea of the state and progress in the field of digital technologies, although not specifically in the field of education, is provided by the reports of the European Commission on the Digital Economy and Society Index (DESI)[13]. According to the ranking of this index, Bulgaria ranks 26th among the EU member states – penultimate place, being able to overtake only Romania. Bulgaria's DESI score is 37.7 (DESI 2022) against the EU average of 52.3. Despite the increase for the last five years (23.9 for 2017), it is not enough to catch up with the rest of the member states, and even from 2020, the lag starts to increase (Figure 5).

[12] https://rsvu.mon.bg/rsvu4/#/media-article/113.
[13] The DESI ranks member states according to their level of digitalisation.

Figure 5. Digital Economy and Society Index (DESI) 2022



Source: DESI 2022.

As for human capital, Bulgaria again occupies the penultimate 26th place. According to the digital skills indicator, Bulgaria achieves a score of 32.6 compared to an EU average of 45.7. The country lags significantly in terms of the share of persons aged 16-74 with at least basic digital skills, and especially of those with above basic digital skills (Table 7).

Table 7. Share of persons with at least basic digital skills and with above basic digital skills (%)

	Share of persons aged 16-74 with at least basic digital skills	Share of persons aged 16-74 with above basic digital skills
Bulgaria	31.2	7.8
EU-27	53.9	26.5

Source: DESI 2022.

Due to the backwardness of the country in the field of digitalisation and digital skills, especially in the conditions of the pandemic, which clearly showed their increasing importance for all spheres of public life, in 2020 a National Strategic Document "Digital Transformation of Bulgaria for the period 2020-2030" was developed and adopted[14], in which the goals for digital transformation of Bulgaria until 2030 are determined. One of the areas of impact, according to this document, is "education and training". In fulfilment of the objectives and measures in this area, the national budget for 2021 allocated financial resources in the amount of two million euros for academic staff training projects, as well as 2.9 million euros for the creation of twenty-one personal development centres, digital skills training for students and young people; over eighty-five thousand electronic devices were purchased; a national programme was approved to integrate information technology classes into non-computer science curricula.

[14] The document was adopted by Decision No. 493 of the Council of Ministers of 21.07.2020, https://www.mtc.government.bg/sites/default/files/cifrova_transformaciya_na_bulgariya_za_perioda_2020-2030.pdf.

The share of households with internet access shows a continuous upward trend – from 45% in 2011 to 83.5% in 2021 and 87.3% in 2022, according to National Statistical Institute data. The share of households with children has increased by 30 percentage points over the same period, reaching 96%. However, the differences in access by region of the country are not small: in the Southwestern region this share reaches 90.5% and in the Northwestern region it is 83.1% in 2022 (respectively 86.2 and 73.5% for 2021). Similar are the differences in terms of access to the internet in cities and villages. In cities, the share of these households reaches 88.8% in 2022 (87.4% in 2021), and in villages – 82.4% in 2022 (71.5% in 2021). The restrictions of the pandemic and the shift to remote work and distance learning stimulated the development of this process – the share of such households in villages, although lower than that in cities, grew significantly faster – by 22.4 percentage points for the period 2019-2022 (11.5 p.p. for 2019-2021) with an increase in cities by 9.1 p.p. for the same period (7.7 p.p. respectively). According to the Digital Economy and Society Index (DESI) 2022 in the area "Connectivity" Bulgaria shows significant progress in coverage with optical lines to buildings (85% of households compared to 50% in the EU), but the overall spread of fixed (63% vs. 78% EU average) and mobile (73% vs. 87% EU average) broadband access remains below the European average.

Against the background of improving access to the internet, data on the share of persons with digital skills is of interest. For the period 2015-2021, it varies around 40%. The share of enterprises that provide their employees with ICT training is also not big – about 9% in recent years, being the highest in large enterprises – about 40%. Despite the observed more substantial growth, the share of employed persons in enterprises using the Internet reaches 40% in 2022. The Digital Economy and Society Index (DESI) 2022 shows that the use of digital technologies by small and medium-sized enterprises fails to reach half of the EU average (25% of SMEs with at least a basic level of digital intensity against 55% for the EU).

Conclusions

COVID-19 struck human beings massively and proved their vulnerability in terms of existence/life and health, including psychological. It had a substantial negative influence on the formation of human capital both quantitatively and qualitatively. COVID-19 considerably increased mortality, affecting both older and younger groups of the population, i.e. reduced the already limited human resources of the country as a whole. This effect was most pronounced during the pandemic, but the consequences are still being felt, and it is possible that they will have a long-term impact. By affecting younger people, those of reproductive age, the virus set the stage for a future decline in the birth rate and for further limitation of the people of the country – bearers of human capital. However, it could not have a more significant long-term influence on the external migration processes and migration behaviour of the population, characteristic of Bulgaria. The restriction of emigration from the country was for a short time.

The pandemic also had a notable negative effect on access to education and training, as well as on the quality of schooling, affecting to a greater extent vulnerable groups of students who already face major challenges in the accumulation of human capital. In addition, negative

consequences are the change in the attitude of students towards the educational process, as well as the effect on the psychological state of children, youth and the older population. All this had its impact on the quality of the newly formed human capital, as well as on maintaining and increasing the quality of the already formed human capital.

The gaps in the education process during the pandemic could be further compensated by participation in the lifelong learning system. This, however, is an additional expense for society and individuals and as practice shows, the participation of the population in training is minimal, and not only during the pandemic. In this case, the negative consequences may have a long-term nature.

The COVID-19 pandemic taught its lessons and spotlighted a number of problems facing the formation of human capital in Bulgaria. It also proved the benefits of digitalisation and stimulated its development. A number of measures in this direction were taken in the country, some of which were more successful. Despite this, Bulgaria is still significantly behind in this regard not only the EU average, but also almost all EU member states.

The pandemic also highlighted the negative consequences of distance learning (digitalisation), especially on the younger generation, but not only. The influence on the psychological state of children and their lower receptivity to the learning material and distraction during distance learning negatively affects both their health and the quality of their schooling, and this also means the quality of the newly formed human capital.

The lessons given by the pandemic provide a starting point for the elaboration of policies and measures not only for the evolvement and implementation of digitalisation, including in education, but also for the preservation and development of the country's human capital.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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EFFICIENCY OF ELECTRONIC GOVERNMENT SYSTEMS[3]

Digital technologies change common and routine processes and open new opportunities for their optimization. Our research aim was to test the hypothesis about the efficiency of information technology tools in public institutions' management; is the e-government system dependent on the level of information technology development or on the level of institutional development? An empirical analysis of the effects of institutional and technical factors on e-government systems in a sample of 193 countries was provided. Were studied data about the e-government system quality and development; of the institutions, Internet, and telecommunication development as well as statistical information about e-government service websites using. The intensity and efficiency of using e-government systems depend on the mentioned factors. The level of institutional development affects the intensity and effectiveness of the use of e-government systems both directly and indirectly, through a variable characterizing the quality of e-government systems. Advanced information technology factors only indirectly affect the intensity and effectiveness of the use of e-government systems. There is no statistically significant inverse relationship between efficiently and effectively operating e-government systems and variables which characterize the institutions and information technologies development. New rules and procedures in the electronic environment can generally affect the development of state institutions. However, such effects were not detected in our research.
Keywords: government; information technology; digitalization; structural equation models; models with mediation; structural reforms
JEL: D80; G14; O32; O33

1. Introduction

The implementation of digital technologies leads to the optimisation of government processes and changes the established citizens' habits. Digital technologies remain purely scientific and technological achievements until implemented in practice and the possibility of their application in a particular area is the necessary attribute and the criterion of success (Benito et al., 2019; Hennart, 2019). As soon as digital technologies are put into practice, their basic rules, restrictions, and processes moved to the forefront in addition to technical capabilities.

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This is especially relevant in the fields of economics, finance, and management (Nambisan et al., 2019). So, the introduction of digital technologies depends not only and not so much on the technologies' quality but on their ability to incorporate into the structure of existing institutional relationships which often completely changes present relationships (Gevorgyan and Gevorgyan, 2021). Rules and procedures for digital technologies introduction have their effect on the risks associated with their introduction: Digital Interdependence Risk, Cyber Security Risk, Personal Data Risks, etc. (Luo, 2021).

Digital technologies' implementation success depends both on the introduced element and on its implementation rules. In almost all countries of the world, efforts are put in to implement and improve the so-called e-government systems aimed at transforming the system of public services, regulation, control, document management, and information into interconnected digital platforms (Twizeyimana, Andersson, 2019). This process is much more successful in developed countries and there are a lot of problems with their implementation in developing countries (Nkohkwo, Islam, 2013). The particular merit (public value) of these technologies is in their widely applied at the state regulation and management levels as well as by businesses and citizens (Bannister, Connolly, 2014).

2. Literature Review

The effect of digital technology implementation on public administration quality is not a new research topic. Its effect in increasing effectiveness on public administration and providing public services was discovered in the early 2000s (Heeks, 2001).

The issue of digital technologies' public value achieved is one of the key notions discussed on e-government. In viewing of Castelnovo (2013) the public value assessment should be focused not on the benefits for individual citizens but rather on certain beneficiaries-groups such as taxpayers or definite consumers of certain government services. Harrison et al. (2012), and Jørgensen and Bozeman (2007) note that public value creation is mainly the objective of public companies. The capabilities of e-government are implemented through the websites of government organizations. The effectiveness of e-government largely depends on the technical characteristics, availability, and relevance of the data published as well as the quality of provided services.

Seulki and Taejun (2019) evaluated the e-government efficiency through the analysis of public service websites that allowed to identify of the involvement level in the electronic public services obtained by citizens and organizations. This data can be used by government agencies to change electronic services' rules and technical characteristics. So, e-government introduction can be assessed by the indicators of the state's institutional development (Cordella, Paletti, 2017; Wang et al., 2018).

Ismail et al. (2020) studied local government bodies in Indonesia and proved that the e-government system significantly reduces the corruption level by increasing the transparency and accountability level in the local government structures. So, this can be considered both at technical and organizational levels, already at the planning period.

Another approach for studying the effect of the state digital technologies implementation is the conducted analysis for a certain country's group in the comparison of the digitalization levels and the institutional development indicators. Suardi (2021) has studied 47 Asian countries by using the components of the E-Government Development Index to assess the level of digitalization. This allowed him to determine global trends in the development of e-government systems and made a conclusion that each digitalization component has a positive effect on the corruption perception level reducing. Adam (2020) has studied this topic in African countries. He has used the mediation analysis with structural equation modelling and has discovered a significant relationship between the information technology development indicators, e-government, and the quality of institutions.

Structural equation modelling (Keith, 2019) has been frequently used in macroeconomic research. For instance, in the Wang et al. (2021) study structural equation modelling was applied to the problem of determining the effectiveness of international investment in infrastructure with Chinese contractors in a sample of 141 countries over a 9-year period (2009-2017). In Dell'Anno's (2020) study the structural equation modelling with the analysis by partial least squares has been used to study the level of perception of corruption in a sample of 165 countries for the period of 1995-2016. This approach can be used to study small and medium-sized enterprises' behaviour in the digital technologies implementation in business processes. Luqman and Abdullah's (2011) research was conducted at 337 small and medium-sized enterprises and identified factors that determined digital technologies' usage. Urbach and Ahlemann (2010) present a general description of approaches that are directed at solving problems in the information technologies field.

3. Research Methods

We provided an empirical analysis of the effect of e-government systems factors by a sample of 193 countries. Mediation analysis with structural equation modelling to assess the performance of e-government systems and their effect on numerous technical and institutional variables has been used.

3.1. Data Description

This research used 4 data groups.

Data about the e-government system development and its quality level: data from the "United Nations Global e-Readiness Reports and the e-Government Surveys" prepared by the Division for Public Administration and Development Management (DPADM) of the United Nations Department of Economic and Social Affairs (DESA) is used. These studies are published biennially in the UN e-government survey (UN, 2020). DPADM publishes 2 indexes, namely, the E-government development index and the e-participation index. The e-government development index is the main index and consists of 3 parts: the provision of online services, the infrastructure of telecommunication services providing the e-government system, and the educational level of potential e-government users. The e-participation index is an additional index characterizing the assessment of e-government services usage level by

various beneficiaries. 3 components of the e-government development index and the e-participation index are used.

The second data group characterizes the development of the Internet and telecommunication technologies in general in countries, without regard for e-government systems. For these purposes, the authors use 5 indicators from the World Bank Development Indicators database that characterize various aspects and sectors of the telecommunications industry (The World Bank, 2020a).

The third group of data characterizes various aspects of the institutional development of countries. So, Worldwide Governance Indicators (WGI) are used (The World Bank, 2020b). These indicators are calculated on the basis of surveys conducted among representatives of business, government, and non-profit organizations in various countries around the world.

The fourth group of data refers to statistical information on the use of websites providing e-government services. Since e-government services are provided through different government-related websites in different countries, it is impossible to find a holistic approach to assess the usage statistics of these websites. On the other hand, in each state, there are tax authorities that provide very similar services to both citizens and the business community of the country. In all the countries studied in the article, these public authorities provide services electronically to some extent. Therefore, in this article, the researchers adhere to the approach of assessing the intensity and effectiveness of the use of e-government services using indicators of Internet traffic on the websites of tax authorities in different countries. This approach allows us to assess the statistical data on the use of e-government services in the entire sample of countries studied in this article. At the same time, with all the possible variety of electronic services provided by the tax authorities in different countries, there is a certain unification based on the functional similarity of the operations of these authorities. This approach can be called using a proxy variable. For these purposes, information from the website https://www.alexa.com is used, which provides information about website traffic. Since website traffic can be quite volatile over time, statistics for a fairly long period of time, namely, the 4th quarter of 2021 is used.

The designations of all used variables, titles and descriptions thereof, are presented in Annex 1. These databases are combined in the current research and a database of 25 indicators for 193 countries has been created.

3.2. Model

According to the authors' assumption, e-government systems are based on 2 components – information technology advances and the institutional development of countries. The model constructed in this paper allows answering the question of whether the information technology and institutional development of countries really determine the level of use of e-government systems, and if so, how important the above components are. In addition, it allows determining how these characteristics affect the use of e-government systems directly or indirectly, through a variable characterizing the level of development and quality of e-government systems. It is also possible to determine the ratio of direct and indirect interaction of these characteristics in e-government systems.

The reverse effect of e-government systems on the information technology and institutional development of countries is also possible. Mediation analysis with structural equation modelling makes it possible to test this hypothesis as well.

3.3. Main Hypotheses

In this paper, the authors explore the relationship between the following characteristics:

1. Level and quality of the e-government systems using (hereinafter, this latent variable is denoted as Usage);
2. Assessment of the effectiveness of the rules and procedures of the e-government system (EGov);
3. Level of institutional development of countries (WGI);
4. Level of information technology development of countries (WB_Tech).

Such hypotheses are tested:

1. The importance of e-government systems in a given country (Usage variable), based on the level of their use, depends on the level of information technology development (WB_Tech variable) and on the level of institutional development (WGI variable). If this hypothesis turns out to be correct, simply improving the technical capabilities in the field of information technology in a particular country will not lead to the formation of e-government systems. A certain level of institutional development is also required for the success of e-government systems. Testing this hypothesis can answer a question from the perspective of the development of public administration systems, namely, whether the investments in information technology tools for managing public institutions can be effective without certain structural changes and institutional reforms.
2. The usage level of the e-government system in a particular country depends on the level of information technology development and on the level of institutional development. Whether the development of information technologies in the country in itself (directly) leads to the development of effective e-government systems or whether special, targeted measures are needed to create these systems is also very important from the perspective of strategic planning and allocation of resources of the state budgets of countries.

3.3. Mediation Analysis with Structural Equation Modeling

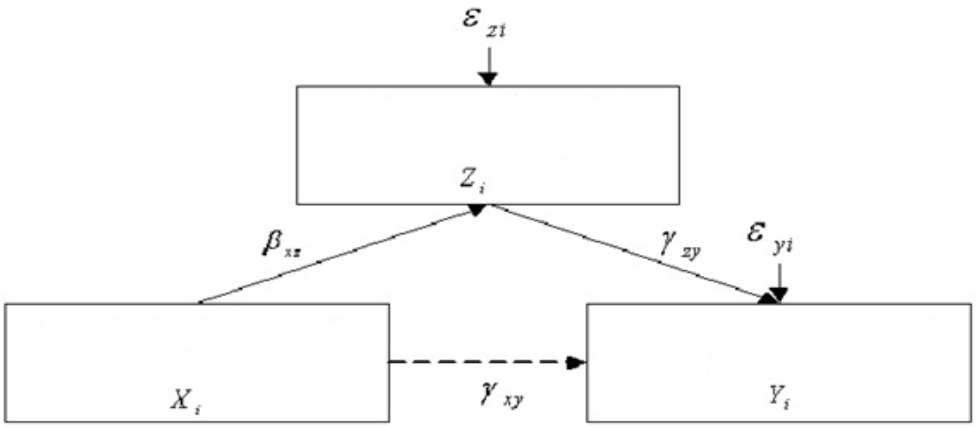
All 4 characteristics (Usage, EGov, WB_Tech, WGI) used in this paper are determined on the basis of a set of variables, which are given in Annex 1 and grouped in accordance with the above-mentioned characteristics. In fact, these 4 characteristics are latent variables. Different methods of factor analysis may be applied to determine and use these characteristics, and afterwards, to use the latter in regression analysis. However, the authors take a different approach and apply structural equation modelling, which enables the simultaneous application of factorial and regression analysis. To describe latent variables and

complex relationships, mediation analysis with structural equation modelling is used (Preacher et al., 2007).

Despite the outward similarity, structural equation modelling is fundamentally different from regression analysis. In regression models, a clear distinction can be made between dependent and independent variables. In structural equation modelling, these concepts are used only in a relative sense, since in one model equation, a variable can be dependent, and in another, the same variable can become independent. This approach makes it possible to use structural equations as models for identifying causality.

Structural equation modelling is often presented as a diagram (Ho et al., 2012). These diagrams consist of nodes representing variables and arrows showing relationships between those variables. In these diagrams, latent variables are depicted as a circle or ellipse, and the observed variables are depicted as a rectangle or square. Arrows represent the effects of one variable on another, and double-sided arrows represent mutual effects. Often the same principles are used to represent the error rates of the estimated parameters.

Figure 1. A structural equation model with mediation



Source: Gunzler et al., 2013.

Figure 1 shows a simple example of a structural equation model with mediating variable Z. Figure 1 shows a causal diagram for three variables using a structural equation model with mediation. Variables Z and Y, which are affected by other variables, are endogenous, while variable X, which affects only other variables, is exogenous. This example assumes that there are no latent variables. Therefore, all variables are represented by rectangles.

The diagram above can be represented by the following system of equations (Gunzler et al. 2013):

$$\begin{aligned} Z_i &= b_0 + b_{XZ}X_i + \varepsilon_{Zi} \\ Y_i &= Y_0 + \gamma_{YZ}Z_i + \gamma_{YX}X_i + \varepsilon_{Xi} \end{aligned} \quad (1)$$

The errors in the equations are not correlated. This is an important condition in structural equation models with mediation. It is also assumed that the errors have a multivariate normal distribution.

In structural equation models with mediation, the following terminology is often used:

γ_{XY} – Coefficient of direct effect;

$\gamma_{YZ} * \beta_{XZ}$ – Coefficient of indirect effect;

$\gamma_{XY} + \gamma_{YZ} * \beta_{XZ}$ – Total effect coefficient.

The above diagram and equations are the most common form of structural equations with mediation.

SEMs allow for the modelling of complex relationships between observed and latent variables, making them a versatile tool for a variety of purposes.

SEM is based on several assumptions, including linearity and normal distribution of factors. Violations of these assumptions can lead to biased parameter estimates and inaccurate estimates of model fit. There are various methods for evaluating structural equation models with mediation (maximum likelihood method, generalized least squares method, weighted least squares method, etc.). Many of the mentioned methods are implemented in various software packages. SEM estimation can be computationally intensive, especially for large data sets or complex models. This may require specialized software resources. In this paper, the maximum likelihood method and the R package lavaan library (Rosseel 2012) are used to build models.

4. Results

To test the hypotheses, many models were tested with different configurations of structural equations. Testing of these models already at a preliminary stage showed that only the models, in which the latent variables EGov and WB_Tech are exogenous, have significant statistical results. Thus, in the model described, these variables are exogenous, while the latent variables Usage and EGov are endogenous.

The regression equations in the final model are as follows:

$$\begin{aligned} \text{Egov} &= a_0 + a_1\text{WB\_Tech} + a_2\text{WGI} + \varepsilon_M (\text{Mediation effect}) \\ \text{Usage} &= b_0 + b_1\text{EGov} + c_1\text{WB\_Tech} + c_2\text{WGI} + \varepsilon_T \ \ (\text{Total effect}) \end{aligned} \tag{2}$$

where:

c_1 and c_2 – coefficients of direct effect;

a_1b_1 and a_2b_2– Coefficients of indirect effect;

$c_1 + c_2 + a_1b_1 + a_2b_2$ – Total effect characteristics;

ε_M – Error in mediation equation;

ε_T – Error in total effect equation.

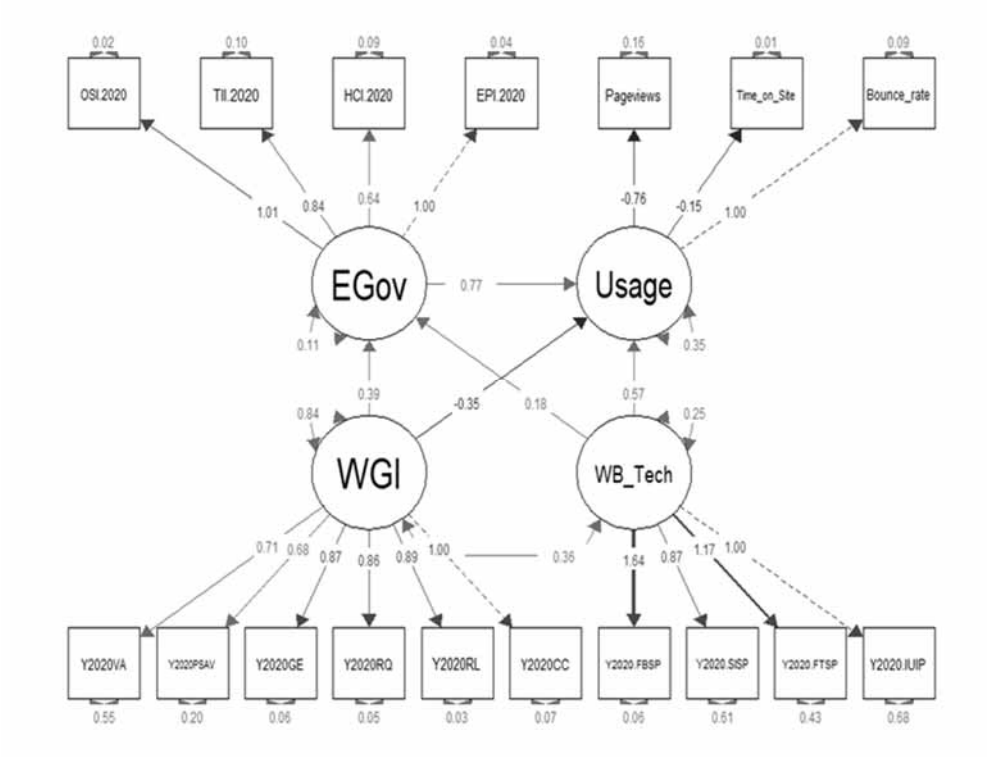
Table 1 below shows the estimates of the regression equations obtained when testing the final model using the maximum likelihood method.

Annex 2 provides complete information about the model under test, including the definition of latent variables (available in the form of lavaan package output). Figure 2 shows a diagram of the final structural equation model with mediation, built using the R package semPath program (Csardi and Nepusz, 2006). Here, the usual notation used in the schematic description of structural equations is used.

The results obtained (Annex 1 and Figure 2) indicate that the model used is generally statistically significant, as evidenced by the results of the Chi-square test. All coefficients of the regression equations are also statistically significant, except for the regression of the WB_Tech variable on Usage.

In the process of shaping latent variables, only statistically significant initial variables were left in the model. As a result of this approach, the Usage latent variable is formed using only three variables, namely, Bounce_rate, Time_on_site, and Pageviews, although initially, the model included all variables indicated in the section "Site traffic data from Alexa.com" (Annex 1). The latent variable WB_Tech is formed without the variable Y2020.MCSP.

Figure 2. Diagram of final model with mediation



Source: authors' calculations.

It is very important that the coefficients of indirect (ab) and total effect of exogenous variables on endogenous ones are also statistically significant at the 10 percent significance level. The values of variable variations are also evaluated in the model. It is evident that the estimates of the coefficients of variation of almost all variables, both latent and non-latent, are significant at the 10 percent significance level. Thus, the results obtained indicate the adequacy and good statistical properties of the model.

5. Discussion

The consideration of the obtained results should be started with latent variables in order to better understand the relationships between the latter. Latent variables WGI, EGov and WB_Tech are based on the characteristics high value of which show a high level of development of institutions, e-government systems and information technology environment, respectively. That is why the coefficients of all characteristics underlying these latent variables in Annex 2 have positive values. It is worth mentioning that the Mobile Cellular Subscriptions (per 100 people) variable, labeled Y2020. MCSP, is not significant for the WB_Tech latent variable, which is most likely due to the fact that the use of mobile communication is definitely not correlated with Internet use, especially with the use of digital technologies in public administration systems. All other variables tested for these three latent variables turned out to be significant and were included in the final model.

Latent variable Usage requires more detailed consideration. It is based on the characteristics of the Internet traffic of the tax services in the countries under study and characterizes the intensity and effectiveness of the use of digital technologies in the public administration system. Certainly, this variable characterizes the intensity and effectiveness of the use of digital technologies in the field of tax and, possibly, customs regulation; however, the authors of this article extrapolate the significance of this variable to the entire public administration system based on the assumption of the homogeneity of the use of digital technologies by individual systems of the state apparatus in a particular country. This assumption is justified since all assessments of the level of digitalization of individual countries do not operate with separate indices for describing specialized areas of public administration. Nevertheless, even if certain unevenness in the use of digital technologies in various areas of public administration is allowed, it will not affect the final results obtained in this paper.

Only 3 of the 10 tested variables, characterizing the Internet traffic of tax services of the countries under study, turned out to be significant for constructing a latent variable. These are the variables that are somehow related to the behaviour of users on the Internet resource. All other variables related to the ranking of websites, the number of search queries, and links to other websites turned out to be insignificant for constructing the Usage latent variable in the model for testing the effectiveness and intensity of the use of digital technologies in public administration systems.

The three variables that have proved to be statistically significant for constructing the Usage latent variable are as follows: Daily Time on Site, Bounce Rate, and Daily Page Views per Visitor. That is to say, the Usage latent variable can be represented as a variable, the high value of which corresponds to fewer page views and less time spent on the Internet resource.

It should be noted that the high value of this indicator can, on the one hand, indicate the effectiveness of the resource from the perspective of the provision of public services, since the users can get the necessary information and services with fewer pages viewed and less time spent. On the other hand, a low level of this indicator may mean that users spend more time on websites and view more pages, which might have a positive effect if the users receive several interconnected services on websites. Table 1 may indicate that the first assumption is most likely correct since the effect of the index – characterizing the level of development of e-government systems EGov on the Usage variable – is positive and statistically significant. Table 1 may indicate that the direct effect of the information technology development of countries on the intensity and efficiency of the use of e-government systems is insignificant. This means that the high level of information technology development in the country does not yet ensure the intensive and efficient use of state Internet resources. The direct effect of the institutional development of countries on the intensity and efficiency of the use of e-government systems is significant and negative. At the same time, the indirect effect (through the EGov variable) of the WG_Tech and WGI variables on the Usage variable (coefficient ab in Annex 2) is positive and statistically significant at the 10% significance level.

Table 1. Estimates of the regression equations of the final model

	Estimate	Std.Err	z-value	P(>|z|)
Usage				
WGI (c2)	-0.349	0.207	-1.686	0.092
WB_Tech (c1)	0.571	0.458	1.246	0.213
EGov				
WB_Tech (a1)	0.177	0.083	2.133	0.033
WGI (a2)	0.392	0.12	3.265	0.001
Usage				
EGov (b1)	0.769	0.379	2.026	0.043

Source: authors' calculations.

This result can be interpreted as follows: the information technology development of countries has an indirect positive effect on the intensity and efficiency of using e-government systems, and it affects through the existence of a high-quality e-government system. The institutional development of countries has a positive effect on the intensity and efficiency of the use of e-government systems only through a variable characterizing the high-quality e-government systems. In the absence of high-quality e-government systems, the direct effect of the WGI variable on Usage is negative, which means that the institutional development without high-quality e-government systems leads to an increase in average page views and time spent on Internet resources. This result is logical since a high level of institutional development leads to a more intensive search for digital methods for obtaining public services; however, the poor quality of e-government systems increases the time spent and resource viewing by agents.

E-government service quality (the EGov variable) is positively correlated with both the WB_Tech variable (5% significance level) and the WGI variable (1% significance level). This is evidenced by the coefficients a1 and a2 indicated in Table 1.

Variables characterizing the institutional development and the level of information technology development of countries affect the intensity and effectiveness of the use of e-government systems through the variable characterizing the quality of these systems as well as directly in the case of the WGI variable (see discussion above). The ab/total coefficient ratio shows the ratio of the indirect and the total effect of exogenous variables on the Usage variable. This ratio is near 2/3 and means that exogenous variables affect the Usage variable mostly indirectly.

A direct effect is also available. It means that it is impossible to have an effectively functioning e-government system without a certain level of institutional development and a developed information technology system.

6. Conclusion

The intensity and efficiency of using e-government systems depend on the level of development of information technologies and institutions. These factors affect the intensity and effectiveness of the use of e-government systems in different ways. The level of institutional development affects the intensity and effectiveness of the use of e-government systems both directly and indirectly through a variable characterizing the quality of e-government systems. Developed information technology factors only indirectly affect the intensity and efficiency of using e-government systems, namely, through the variable characterizing the quality of e-government systems. A certain level of institutional development is necessary for the effective operation of e-government systems. E-government systems can only exist in a certain institutional environment. Technical solutions and information technology development are prerequisites for the development of the e-government system. However, the existence of productive rules and mechanisms for their implementation are of major importance for the successful use and effective operation of the mentioned systems.

There is no statistically significant inverse relationship between high-quality and efficient e-government systems and variables characterizing the development of institutions and information technologies. This kind of link is unlikely in the case of information technologies. But in the case of institutions, it might well exist since the creation of new rules may affect the development of institutions as a whole and the creation of new behaviour stereotypes. However, such an effect was not found. It means that it should not be expected that the creation of e-government systems may lead to structural changes and institutional reforms.

The analysis of the latent variable of efficiency and intensity of the use of e-government systems – based on the characteristics of Internet traffic – showed that variables, based on user behavioural preferences, are important for this indicator, which indicates the efficiency and intensity of the use of e-government systems are based largely on the institutional and behavioural aspects of social and economic reforms.

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Annex 1

Name	Short Name	Description
UN e-governance indicators		
E-Participation Index	EPI.2020	
Online Service Index	OSI.2020	
Human Capital Index	HCI.2020	
Telecommunication Infrastructure Index	TII.2020	
World Development Indicators		
Secure Internet servers (per a million people)	Y2020.SISP	
Fixed broadband subscriptions (per 100 people)	Y2020.FBSP	
Mobile cellular subscriptions (per 100 people)	Y2020.MCSP	
Fixed telephone subscriptions (per 100 people)	Y2020.FTSP	
Individual Internet using (% of population)	Y2020.IUIP	
Worldwide Governance Indicators		
Voice and Accountability	Y2020VA	
Political Stability and Absence of Violence/Terrorism	Y2020PSAV	
Government Effectiveness	Y2020GE	
Regulatory Quality	Y2020RQ	
Rule of Law	Y2020RL	
Control of Corruption	Y2020CC	
Site traffic data from Alexa.com		
Site's Overlap Score	Site_Overlap	Comparative level of the current site's audience and similar sites: calculated from an analysis of common visitors and/or search keywords. A higher score means a higher audiences overlap.
Alexa Rank1 Today	Alexa_1	In global internet traffic and engagement over the last 90 days, as of 1 October 2021
Alexa Rank2 Today	Alexa_2	In global internet traffic and engagement over the last 90 days, as of 31 December 2021
Country Rank Alexa	Country_Alexa	
Search	Search	Traffic in % that comes from both organic and paid search.
Total Sites Linking In	Linking	Sites that link to this site (recalculated weekly).
Visitors by Country	Visitors_Country	Visitors from a country
Daily Time on Site	Time_on_Site	Daily average time in min. and sec. that a visitor spends on a site.
Bounce rate	Bounce_rate	
Daily Page Views per Visitor	Pageviews	Site visits percentage: consists of a single-page viewing.

Annex 2

lavaan 0.6-9 ended normally after 83 iterations:
Estimator –ML;
Optimization method – NLMINB;
Number of model parameters – 40;
Number of observations – 32;
Model Test User Model:
Test statistic – 266.482
Degrees of freedom – 113
P-value (Chi-square) – 0.000
Parameter Estimates:
Standard errors – Standard
Information – Expected
Information saturated (h1) model – Structured

	Estimate	Std.Err	z-value	P(>|z|)
LATENT VARIABLES				
Usage = ~				
Bounce_rate	1.000			
Time_on_Site	-0.145	0.027	-5.403	0.000
Pageviews	-0.763	0.138	-5.536	0.000
WB_Tech =~				
Y2020.IUIP	1.000			
Y2020.FTSP	1.168	0.428	2.729	0.006
Y2020.SISP	0.871	0.389	2.238	0.025
Y2020.FBSP	1.641	0.528	3.110	0.002
EGov =~				
EPI.2020	1.000			
HCI.2020	0.642	0.110	5.854	0.000
TII.2020	0.844	0.122	6.945	0.000
OSI.2020	1.013	0.086	11.765	0.000
WGI =~				
Y2020CC	1.000			
Y2020RL	0.895	0.057	15.689	0.000
Y2020RQ	0.860	0.060	14.294	0.000
Y2020GE	0.874	0.064	13.766	0.000
Y2020PSAV	0.684	0.094	7.310	0.000
Y2020VA	0.707	0.149	4.757	0.000
REGRESSIONS				
Usage ~				
WGI (c2)	-0.349	0.207	-1.686	0.092
WB_Tech (c1)	0.571	0.458	1.246	0.213
EGov ~				
WB_Tech (a1)	0.177	0.083	2.133	0.033
WGI (a2)	0.392	0.120	3.265	0.001
Usage ~				
EGov (b1)	0.769	0.379	2.026	0.043
Covariances	Estimate	Std.Err	z-value	P(>|z|)
WB_Tech ~~				
WGI	0.358	0.154	2.324	0.020

	Estimate	Std.Err	z-value	P(>|z|)
VARIANCES				
Bounce_rate	0.091	0.062	1.480	0.139
Time_on_Site	0.006	0.002	3.139	0.002
.Pageviews	0.160	0.053	3.026	0.000
.Y2020.IUIP	0.681	0.175	3.881	0.000
.Y2020.FTSP	0.427	0.116	3.688	0.000
.Y2020.SISP	0.606	0.155	3.902	0.000
.Y2020.FBSP	0.057	0.078	0.738	0.461
.EPI.2020	0.040	0.015	2.723	0.006
.HCI.2020	0.091	0.024	3.815	0.000
.TII.2020	0.104	0.028	3.711	0.000
.OSI.2020	0.018	0.012	1.526	0.127
.Y2020CC	0.065	0.021	3.159	0.002
.Y2020RL	0.033	0.012	2.652	0.008
.Y2020RQ	0.047	0.015	3.131	0.002
.Y2020GE	0.056	0.017	3.256	0.001
.Y2020PSAV	0.202	0.052	3.876	0.000
.Y2020VA	0.553	0.140	3.952	0.000
.Usage	0.347	0.118	2.942	0.003
WB_Tech	0.248	0.163	1.516	0.130
.EGov	0.105	0.032	3.278	0.001
WGI	0.842	0.227	3.716	0.000
DEFINED PARAMETERS				
Ab	0.437	0.239	1.826	0.068
Total	0.659	0.356	1.850	0.064

ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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DIGITAL TRANSFORMATION IN THE MIDDLE EAST: DIRECTIONS, OUTCOMES AND CHALLENGES[5]

The article is focused on understanding the features of digitalization in the economy of the Middle East countries. Since digitalization has become a global trend, in which countries are being drawn at various speeds and degrees, it is important to understand and systematize the evolution of this process in different regions. In the Middle Eastern digitalization has been embodied in a number of sectors, industries, productions and activities of the region. This process is unfolding based on existing prerequisites - both regional and global. It is becoming increasingly important for the countries of the region, as it can significantly enhance the resilience of their economies to external challenges. The authors concluded that digitalization in the Middle East lags behind developed countries, but at the same time, is going on the same path as at the global level.

Keywords: Middle East; GCC; Digitalization; Digital Economy; Digital State
JEL: O31; O33; O38

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1. Introduction

The countries and regions of the world today constitute virtually a single economic organism. The success of the functioning of this organism in any sphere, including the digitalization of the economy, depends on many factors and every participant, i.e. every country, without exception. The implementation of digital elements in different countries, their quantity, their interconnectedness in the system and the interaction of national digital systems at the regional and global levels expand the global perspectives and effects of digitalization as a whole, creating a synergistic effect.

Digitalization of the economy nowadays appears as an object and subject of research by many scientists and experts (Aidrous, Asmyatullin, Glavina, 2021). The content, elements, directions, role, geography, efficiency and prospects of digitalization remain the subject of scientific debate. All countries are at different stages of digitalization depending on the resources available to the country (Digilina, Lebedeva, 2020). The effects and scope of digitalization also vary (Asmyatullin, 2021). Thus, states, including Middle Eastern countries, have the opportunity to design and implement digitalization programs based on their capabilities and objectives (Digital Economy, 2022).

The Middle Eastern states, mainly the Gulf Cooperation Council (GCC), which have already joined the global innovation process through manufacturing and logistics (Shkvarya, et al. 2019), are now voicing their intentions not only to form the foundations of the digital economy, but also to catalyze this process (Melanina, 2020). This research explores the ways and possibilities of realizing this goal and the achievements of the Middle Eastern countries in the digital sphere in comparison with global trends.

2. Methodology

The theoretical basis of the study was formed by the works of Russian and foreign scientists, whose object of study was the digitalization of the economy and trade, the development of digital infrastructure and the massive growth of its application. The statistical basis was data from the UN Conference on Trade and Development. The historical, statistical and comparative methods used by the authors in this article making possible to identify the common and special features in the development of digitalization in the world and in the Middle East region and to provide a scientific justification for the stages of these processes.

The study is based on UNCTAD data for 2000-2022, as UNCTAD has been maintaining international statistics on the digital economy and trade since 2000. Data for the 2019-2022 Inclusive Internet Index are also used.

3. Results

The Middle East as a component of the world economy is experiencing all those transformations that are inherent in the global system as a whole (Krylov, Fedorchenko, 2015).

We divide the preconditions for the development of digitalization in the Arab world into two blocks: global and regional. Let us consider the first one. By global preconditions we mean, firstly, the creation of the World Wide Web (Internet) at the end of the 20th century; secondly, the sharp increase in the number of calculations per second (in the same period); and, thirdly, the combination of these two factors at the turn of the century - mobile Internet provided an opportunity to actively create, develop and use digital infrastructure in all spheres of life of the world and individual countries on the basis of the rapid development of ICT (Shkvarya, Hailing, 2021). Throughout this period, research on this process has been carried out more as specific developments that have received little dissemination (Nureev, 2018).

Nevertheless, technological development has created the technical and organizational conditions for remote access and control of economic, social, technical, educational, administrative and other processes in 2000-2018. On the other hand, the growth of competition and the objective process of unbalance in the world markets made it necessary to realize these conditions. The peculiarity of this stage was the use of digital capabilities along with traditional ones.

Finally, the global COVID-19 pandemic in 2019-2020 has significantly catalyzed the implementation and use of digitalization, which has become not just a fashion trend, but a real development factor. States and economic entities, primarily entrepreneurs, are looking for new ways to use high technologies, actively pushing developers to improve the most in-demand solutions. It was the pandemic that allowed – in the context of lockdowns – global economic players to reduce losses, to realize positive effects and thus to support economic systems.

Therefore, the process of digitalization in the world has gone through 3 stages of its development (see Table 1).

Table 1. Stages of digitalization development in the world

Period	Main features
Stage 1: second half – last quarter of the XX century	Emergence of technical capabilities for digitalization. Development and implementation of digital infrastructure based on the widespread use of ICT
Stage 2 (pre-covid) – 2000-2018	Virtualization of social, economic, technical, administrative and other processes along with traditional methods.
Stage 3 (post-covid) – 2019-ongoing	Significant acceleration and development of digitalization in quantitative and qualitative aspects. Formation of digitalization as an integral and comprehensive system affecting all spheres of life of states, enterprises and citizens.

Source: created by the authors.

All countries of the world and all macro-regions are involved in the process of digitalization to varying degrees. Thus, according to UNCTAD, only a few countries are currently creating advanced technologies (UNCTAD, 2023). These are, first of all, the United States and, increasingly, China, which is vigorously pursuing and financing digital transformation in the economic and social spheres.

According to UNCTAD experts, the market for 11 advanced technologies is currently estimated at $350 billion, and according to UNCTAD projections, it could grow to more than $3.2 trillion by 2025. The United States is the leading supplier of the most advanced

technologies, as it is the home of major cloud computing platforms. Chinese developers of fifth-generation (5G) mobile communications, drones and solar photovoltaic systems also stand out. It is noteworthy that from 30 to 70% of patents and publications for each of the technologies are also in the United States and China (UNCTAD, 2023).

Thus, digitalization is one of the most important and sustainable trends in the development of the modern world economy, which has become significantly more relevant with the global coronavirus pandemic (see Table 1), and, according to our estimates, in the short term, this qualitative evolutionary leap will cover most aspects of life in all countries of the world considering the remaining digital divide.

However, what are the role and the place of the Middle East countries in the global digitalization process? The digitalization process in Middle Eastern countries has its own pronounced specifics, which are connected with the peculiarities of this group of states (significant population growth, large reserves of strategic natural resources, the need to transform the national economy in the context of the energy transition, etc.). These and other peculiarities set urgent tasks for the respective states to stabilize the dynamics of GDP production, diversify the economy on a modern basis and continuously create new and highly paid jobs for the population, especially for the young.

On the other hand, the large number of young people in Middle Eastern countries who know the opportunities of the virtual world, including the economy, and who are usually well-educated (Aidrous, Asmyatullin, Glavina, 2021), provide not only the need, but also the opportunity to "digital transition" in these countries and, on this basis, to the creation of attractive prospects for digitalization.

Indeed, among the positive aspects of digitalization is the possibility of upward vertical social mobility, which can certainly be seen as a means of stabilizing the social sphere of the state as a whole.

The research conducted on digitalization in the Middle East suggests that the process of digitalization in this region is not only taking place, but is also assessed by experts as very active and effective. In this regard, it is worth noting that back in 2017 Saudi Arabia was among the largest digital economies in the world (Shkvarya, Frolova, 2017).

However, this group of countries has a number of specific characteristics in the sphere of digital economy development stages. Some of them, in our opinion, can be considered regional prerequisites for the development of digitalization.

In the countries of the target group, satellite television began to spread in the early 1990s, and then in 1999-2000 Internet services were launched, and the Internet was thus widely developed, especially among young people. Since the beginning of the XX century, the Internet has become a fact of life, and in 2003 at least 4% of the population (about 11 million people) in Middle Eastern countries used the Internet (Solovieva, Korenevskaya, Lebedeva, 2020).

Thus, the last decade of the twentieth century can be seen as the first stage of digitalization spread in the countries of the region.

The XX century showed a qualitative deepening and quantitative expansion of digital capabilities in the Middle East. A major and perhaps even fundamental role in this was played transfer of technologies for the development of high-tech and innovative spheres of the Middle East countries (Digital Economy, 2022). As a result, these countries became importers of high-tech goods, as well as high technologies themselves.

As can be seen in Table 2, in 2000-2005, Middle Eastern countries' imports of high-tech goods were smaller in volume (and grew at a slower rate) than those produced by medium-skilled workers and knowledge-intensive industries. The latter group, according to UNCTAD data, is represented mainly by engineering products - agricultural products, machinery, food production machinery, pulp and paper industry equipment, steam generating boilers, etc.

Table 2. Middle Eastern countries imports of medium-skilled and knowledge-intensive manufacturing products and high-tech industries products in 2000-2020, USD million in current prices at current exchange rates

	2000	2005	2010	2015	2020
Medium-skilled and knowledge-intensive industries	56335,6	113181,4	52375,2	147931,0	4199537,1
Highly skilled and high-tech industries	50979,3	97441,3	90175,8	92988,3	5463331,5

Source: based on Technology and Innovation Report, 2021.

The statistical data in Table 2 confirm that, in general, the volume of imports of medium- and high-tech product groups by the countries under consideration has increased by 102.8 and 143.9 times respectively over a quarter of a century. This stage also corresponds to the first stage of the global development of the digital economy (see Table 1).

Thus, from the beginning of the 21st century, the quantitative and qualitative growth of imports of both groups of goods began on the basis of the actualized tasks of transformation of the national economies of the Middle East countries, primarily the GCC, and of the attempts of this group of states – often successful – to start their own high-tech, at least assembly, production (Digital transformation, 2023), which allows us to characterize this period as the second stage of the development of digital opportunities. However, the global financial and economic crisis of 2008-2009 changed this trend, and 2010 showed a significant decline in medium- and high-tech imports by Middle Eastern countries. This leads us to the conclusion that the most characteristic feature of the Middle Eastern countries remains not the development, but only consumption and implementation of high-tech and, in particular, digital technologies.

At the same time, at this stage, the further spread of Internet use, the increase in the number of users, and their involvement in social networks were also registered (see Table 3).

International statistics note that in 2020, the Middle East recorded a 5227% growth in Internet usage relative to the level of 2000, and the global growth in Internet usage – 1266% (UNCTAD, 2023). This situation was largely influenced by the creation of digital development strategies by Middle Eastern countries (see Table 4) and by their gradual implementation.

Table 3. Internet diffusion in the Middle East

Countries	Population at the beginning of 2021, persons	Users, December 2000	% of the population (penetration)	Internet, % of users
Bahrain	1748296	40,000	97.7	0.9
Iran	85028759	250,000	91.8	39.3
Iraq	41179350	12,500	59.6	12.3
Israel	8789774	1,270,000	79.7	3.5
Jordan	10269021	127,300	84.7	4.4
Kuwait	4328550	150,000	98.3	2.1
Lebanon	6769146	300,000	81.9	2.8
Oman	5223375	90,000	76.8	2.0
Palestine	5222748	35,000	64.8	1.7
Qatar	2930528	30,000	104.3	1.5
Saudi Arabia	35340683	200,000	90.1	16.0
Syria	18275702	30,000	46.5	4.3
UAE	9991089	735,000	103.3	5.2
Yemen	30490640	15,000	25.9	4.0
TOTAL for the Middle East	265587661	3,284,800	75.2	100.0

Source: based on UNCTAD, 2023.

Table 4. Digital development programs/strategies in Middle East countries

Country	Program / Strategy	Year of adoption
Bahrain	National e-government Strategy	2010
Israel	The Digital Israel National Initiative: The National	June 2017
	Digital Program of the Government of Israel	
Jordan	e-Government Strategy	2014
	Jordan National Information and Communications Technology Strategy	2013
Iraq	Government of Iraq e-Government Strategy	2007
Qatar	National ICT Plan. Advancing the Digital Agenda	2010
	e-Government 2020 strategy	2015
Lebanon	E-Government Implementation Plan	2012
UAE	Fourth Industrial Revolution Strategy	2017
Oman	e.Oman Strategy	Not specified
Turkey	Bilgi toplumu stratejisi ve eylem plani	2014
	National e-Government Strategy and Action Plan	2015

Source: created by the authors.

Most of them were adopted between 2000 and 2018, i.e. at the second stage of digitalization according to the classification we have adopted. However, not all countries have developed such programs to date.

Middle Eastern countries are able to transform digital data into concrete business opportunities. However, they are still at a disadvantage when it comes to added value creation.

As a result, according to international experts, the countries in the considered group are currently at an average level in terms of some digitalization indicators, such as 5G coverage (World Population Review 5G, 2023).

At the same time, there is a significant growth of indicators. For example, Bahrain and the UAE lead the way in terms of e-government; both countries have a fairly high digital readiness index, with the UAE also having a good innovation index while Bahrain's is relatively low (see Table 5).

Table 5. A number of indicators of digital development in GCC countries

Country	Digital readiness index	Innovation index	E-Government index
Bahrain	5,1	34,67	0,8116
Qatar	5,2	37,9	0,7132
Kuwait	4,2	36,1	0,7388
UAE	5,3	43,24	0,8295
Oman	4,3	31,83	0,6846
Saudi Arabia	4,8	36,17	0,7119

Source: Shkvarya Semenov, 2022.

In particular, small and medium-sized enterprises in GCC countries are becoming more involved in the digitalization of their national economies, producing new products and creating new high-paying jobs, including agriculture.

Thus, countries in the region continue to build on their achievements in the digital economy (albeit almost through the transfer of advanced and high technologies only) and face ever-evolving and renewed risks of ongoing technological innovation.

For the transition to the digital age in a given region, the government must be responsible for creating an enabling environment through policies and regulations that foster digital transformation. High-level political support, ensuring a stable and predictable policy environment, promoting a sustainable environment for private sector investment, adopting regulatory best practices and stimulating demand for digital solutions are components of an enabling environment. An enabling environment for all major components and critical sectors of digital transformation is fundamental.

Regulators need to keep pace with advances in technology, consider new regulatory frontiers and create a framework on which digital transformation can realize its full potential.

Public policy, regulatory and legal frameworks should be relevant, flexible, incentive-based and market-oriented to support digital transformation in all sectors and regions of the continent.

In addition, recognizing that the Internet is an important tool and dynamic force for economic, social and cultural development, there is a need to focus the discussion on Internet governance and related public policy issues to enable, develop and support the local digital economy.

A telling example is the Inclusive Internet Index, which rates countries on four indicators:

1. availability (assesses the quality and breadth of available infrastructure for Internet access, as well as levels of Internet use);
2. affordability (the cost of access in relation to the income level of the population and to the level of competition of Internet providers);

3. relevance (availability of content in the local language and its diversity);
4. readiness (mass access opportunities, including public skills, cultural and information policies).

As a result of the implementation of national digitalization strategies in 2022, some Middle Eastern countries improved their indicators in infrastructure development, support for internet access, digital readiness, etc. For example, the UAE improved its position in the global ranking and became the leader among Middle Eastern countries, ahead of Qatar, the leader of previous years. In terms of internet accessibility, the UAE ranked 5th in the world in 2022 due to its high level of connectivity quality and usage volumes. However, the UAE performed below the global average in other areas of the ranking (Table 6).

Table 6. Middle East countries ranking in the Inclusive Internet Index for 2019-2022

Country	Place in the world			
	2019	2020	2021	2022
UAE	40	35	31	26
Qatar	34	30	29	27
Kuwait	43	34	36	33
Oman	39	39	37	38
Saudi Arabia	35	38	43	39
Bahrain	-	47	45	40
Morocco	57	61	57	52
Jordan	51	57	56	60
Lebanon	-	62	71	74

Source: created by the authors according to The Inclusive Internet Index, 2023.

Qatar has moved to 2nd place among Middle Eastern countries in the overall Inclusive Internet Index and is among the top performers in terms of accessibility and readiness. In the area of information policy, Wi-Fi accessibility initiatives are being actively promoted. But if you look at the global accessibility ranking - Qatar is only ranked 47th.

Kuwait ranks 33rd in the world and is one of the leaders in Internet accessibility in the region. However, relevance and readiness remain weaknesses due to a lack of relevant content on the Internet, relatively low literacy rates and challenges in information policy development.

In terms of overall internet inclusiveness, Oman ranked 38th in 2022. In the «Readiness» category, Oman leads the Middle East and ranks 10th globally. The country's strong rates are driven by continued improvements in trust in government websites and applications, as well as in e-commerce security. Despite these advances, trust in social media information declined in 2022. Internet accessibility indicators in Oman are low because of the weak competitive environment.

Saudi Arabia experiences periodic fluctuations in the Inclusive Internet Index ranking and was the 39th in 2022 – an improvement in 2021 and a trend towards regaining lost ground in previous years. It ranked 2nd among the Middle East countries in terms of relevance, thanks to the active development of eHealth. Ranked 4th in the region for accessibility, Saudi Arabia's growth in this category was driven by improvements in internet quality and unlicensed software policies.

Bahrain is ranked 40th in the world in 2022, showing an improvement of 5 positions from last year. Its local and relevant content, digital literacy, trust and security scores are significantly higher than the global average. However, the competitive digital environment in the country is weakening year on year.

Despite above-average accessibility indicators, Morocco's overall performance in supporting Internet access globally, as well as among Middle Eastern countries, remains weak. This is partly the result of low digital literacy and limited development of e-connectivity and broadband strategies.

Jordan ranks among the last countries in the Middle East and 60th in the world on the Inclusive Internet Index. Disadvantages include low internet connection speed and low levels of internet trust and security. In the «Readiness» category, Jordan ranks penultimate in the region, due to a marked decline in trust in government and non-government organizations' websites and apps from year to year. In 2020-2021 Jordan achieved an increase in relevance (local language content availability and diversity) due to the benefits of local and e-health content, but the country saw a drop in relevance in 2022.

Lebanon's overall performance is constrained by low readiness indicators, where the country ranks 97th out of 100 countries in the Index. Lebanon's weakness is in its policy environment along with low literacy rates, with Lebanon ranking 99th out of 100 countries in the «policy» sub-category and 92nd out of 100 countries in the «literacy» sub-category.

However, it should be noted that almost all countries under review (with the exception of Jordan and Lebanon) have a steady upward trend in their Inclusive Internet Index scores.

A number of Arab countries have successfully positioned themselves in the global information and communication technologies (ICT) market, particularly in the area of services and outsourcing. For example, this sector is growing at an annual rate of 7.5%, partly due to business ties with business entities in Saudi Arabia and other Gulf countries (MENA Infrastructure Key Themes, 2017). ENOC and EPPCO companies in Dubai, among others, have upgraded their "RFID-enabled prepaid fueling" system to allow free and cardless automated payments. Some major oil companies in the GCC countries are seeking to make the development of their oil fields smarter by digitizing a number of operations using big data, as well as analyzers, sensors and control systems.

Another positive example is the taxi company Careem, which is able to compete with other players in the Middle East market by using a strategy based on B2B integration and complementary tools such as scheduled bookings not only for its drivers, but also for, for example, for the drivers of the Road and Transports Authority in Dubai.

In the UAE, Etisalat and Du companies have launched several digital projects, including «smart cities».

As for other countries in the region, Qatar and Bahrain are leading Arab countries in the ICT supply and in innovation sphere due to their high 3G coverage and low prices. Qatar's highly developed Internet in ICT supply and innovation (MENA Infrastructure Key Themes, 2017).

Despite the widespread adoption of smartphones in the UAE, Bahrain and Qatar (as discussed earlier), due to weaker smartphone use in most other Arab states in the Middle East and North Africa, the regional average is quite low.

Saudi Arabia, in its «Vision 2030» program, declares a very ambitious goal: to become one of the top countries in the world as established on the basis of the E-Government Survey Index.

In order to achieve the objectives, set out in «Vision 2030», the Digital Transformation Program was launched in the Kingdom, under which the Fekra Tech platform was created to address primarily the challenges in the Saudi healthcare sector (Al-Dosari, 2016).

Another program, the largest e-platform Etimad, works with 450 government agencies that use its portal.

There is also the Absher program, which links to more than 130 public services used by citizens of the Kingdom. For example, thanks to this program, the procedure for renewing a passport has been reduced from eight to one day.

Bahrain's digital strategy is focused on eight key points: increasing participation of society; development of partnership between the state and private sector in information and communication services promoting; improving digital literacy of the population and government employees; achievement of higher level of performance; ability to co-operation; government efficiency; offering quality services and strengthening e-government communication channels; promoting innovation and entrepreneurship.

Nowadays the region as a whole is mainly an importer and consumer of high technologies. Governments in the Middle East are spending quite a lot of financial resources on information technology and its maintenance (McKinsey Global Survey, 2021).

Currently, the digital market in the countries of the region under review is highly fragmented. Almost no regional company is able to achieve the required level of economic efficiency, as each of them maintains its own service provider. Information experts believe that in order to overcome the fragmentation of this market, Arab governments need to promote the consolidation of local providers and support joint ventures.

The digital transformation evolving in the Middle East region is placing demand for highly skilled ICT professionals. According to "Oxford Economic Survey", among all technical professions, digital specialists seem to be the most in demand. Considering the shortage of local and regional human resources in this field, many projects in Arab countries are implemented by global companies.

It seems that some solutions may include the use of new technologies (information and communication, digital technologies, etc.). At the same time, many experts believe that digital transformation in this group of states must be accompanied by social innovations and some cultural shifts in order to achieve a positive result. At the same time, they emphasize that achieving a balance between traditional and modern cultural standards is extremely important.

A number of recommendations are offered for the development of the digital economy in the Middle East:

1. To continue to develop and implement national, regional and continental digital infrastructure master plans, considering the convergence of technologies;
2. To modernize existing infrastructure and integrate and complement new infrastructure projects;
3. To increase investment in telecommunications infrastructure at national and regional levels ads to develop financial instruments through partnerships between investors, government, financial institutions and international partners;
4. To create innovative financial tools for infrastructure deployment with a focus on underserved areas;
5. To promote a favourable regulatory environment for competitive and harmonized regional and continental markets of communications;
6. Develop or enhance existing digital platforms to serve citizens, businesses and public institutions in all aspects of life, including health, education, commerce, transport and public goods;
7. Implement or strengthen ICT reforms;
8. Digitize the basic information infrastructure for postal services, especially for the development of e-commerce;
9. Encourage public-private partnerships to increase investment.

The authors' analysis of the adopted digitalization strategies in the Middle East suggests that the leading role in this process at the current stage belongs to the state. Firstly, digital technologies and, as before, innovations, are introduced at large state-owned enterprises and with the help of state incentives. At the same time, we can talk about the significant prospects offered by digitalization for small and medium-sized enterprises. Second, the predominant role of the state in the processes of digitalization of the Middle East economy is also evident in the legislative aspect, as states are, to varying degrees, seeking to create enforcement frameworks for greater adoption and application of digital capabilities in various spheres, including "digital state", "smart city", etc. Thirdly, we can say that the demand for digital technologies in the Middle East remains fragmented. It covers to a greater extent the energy, chemical and petrochemical industries, as well as the financial sector, including capital management. There is a growing demand for digitalization in the social sphere, such as education and medicine (16 Key Internet statistics, 2023). It is worth noting that such aspects as e-commerce are less developed in Middle Eastern countries than in other developing regions. Finally, depending on the digitalization objectives formulated in the relevant strategies and government programs and on the level of development of the national economies of the Middle East countries, it can be concluded that there is significant differentiation in this aspect between the countries.

4. Conclusion

This study allows us to formulate several conclusions regarding the process, prospects and challenges of the development of economic digitalization in the Middle East. First of all, it is the accelerated evolution of digitalization in the Middle East countries. While the implementation of innovations and technologies in these countries has been a bit slower than in others, digitalization is actually developing in the same direction as at the global level. Further, it is worth noting the persistent regional differentiation and fragmentation in digitalization, which weakens regional capabilities. Finally, we see the prospects of digitalization as an important basis for the development of the labour market and the whole social sphere in the Middle East.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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TRANSFORMATION OF INNOVATIVE BUSINESS MODELS THROUGH THE DIGITALIZATION OF THE ECONOMIC SPACE[5]

The relevance of the study is due to the need to determine a business model that meets the modern realities of doing business at the initial stage of building a business. The purpose of the paper is to study approaches to building business models of innovative enterprises and companies in Kazakhstan, taking into account the impact of the global pandemic and digital technologies. The transformation of business models is analyzed on the example of the sphere of innovative entrepreneurship using theoretical methods (analysis; synthesis; concretization; generalization; method of analogies; modelling). As a result, the key criterion that distinguishes innovative entrepreneurship from its classical understanding is formulated and a typical business model of an innovative enterprise was formed.
Keywords: digital economy; transformation; business model; technology; innovative entrepreneurship
JEL: C51; C55; C59

1. Introduction

In recent decades, there has been an information revolution that has caused an increase in productivity and significant changes in production, creating innovative activities, products, and services. In the conditions of the digital economy, digital data ensure the growth of labour productivity and competitiveness of enterprises (Guo et al., 2017, p. 175). The global nature is the main feature of the digital economy. The virtual world changes the types of markets

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and society, its players operate with ideas, network principles, and machine technologies (Abdrakhmanova et al., 2021). The digital economy includes fundamental elements such as artificial intelligence, big data, the Internet of Things, mining, cloud storage, and digital platforms. Innovations spread with their exponential speed, and the power of influence of digital complexes and innovative ecosystems change not only the way how companies think but also the principles of economic mechanisms (Olifirov et al., 2019, p. 87; Carol, Liñeira, 2023, p. 21).

The share of innovation and knowledge is constantly growing, which leads to the dominance of the service sector over the production one. Innovative entrepreneurship is developing. Growing mobility has intensified globalization, and the interaction between countries, and at the same time has generated problems of global concern (for example, cybersecurity) (Ohrimenco, Borta, 2021, p. 149). The main goal of innovative entrepreneurship is to make a profit by creating technical and technological innovations and spreading innovations in all aspects of the economy. Innovative entrepreneurship refers to business models that use new technologies, to create innovative products and services (Zhakupov et al., 2023, p. 17). Modern management technologies are also a criterion of innovative entrepreneurship. This is what distinguishes this form from entrepreneurship in its classical sense. Due to the great competition, only strong innovation-oriented organizations survive that can meet the new needs of customers. Mastering digital technologies is of priority importance for digitalization (Goldfarb, Tucker, 2019, p. 18).

Any business model is a compact representation of enterprises' activities during a certain period of their lives. Any business models are gradually becoming obsolete and require updating. The correct assessment of the situation and the choice of a future-oriented business model is a critical factor for business success (Tan et al., 2017, p. 4999). In the new realities of doing business in the context of the COVID-19 pandemic, the use of digital technologies has become the only condition for business survival, and an opportunity for rapid growth and financial stability of some companies (Nasir, 2021). Over the past ten years, serious work has been carried out on the development of innovations and a knowledge-based economy in Kazakhstan, the creation of an innovation ecosystem within the framework of the implementation of the National Development Plan of the Republic of Kazakhstan, which is called Digital Kazakhstan, and state programs of industrial and innovative development (Forbes Kazakhstan, 2021). In the Global Innovation Index rating, Kazakhstan has improved its position to 77th place (79^{th} place in 2019). According to the Global Index (Institute of Marketing and Sociological Research Elim, 2021) competitiveness of the World Economic Forum, Kazakhstan ranked ninety-fifth in 2019 in terms of the "innovation potential" factor (no assessment was carried out in 2020). In addition, Kazakhstan returned to the Bloomberg Innovation Index rating (top 60 countries) and took 59^{th} place in 2020.

The novelty of the research lies in an analysis of pandemic factors and restrictive measures on the functioning and transformation of modern business models of innovative entrepreneurship. The benefits of digital transformation are obvious, but at the moment there is a gap in how companies use analytics and data for business development. There remains considerable potential in terms of studying digitalization and data analytics (Slugin, Belentyeva, 2019, p. 105; Abell, 1980; Brynjolfsson et al., 2021; Dyomushkina, Galimzhanova, 2014, p. 6; Leonova, 2021a, p. 5; Leonova, 2021b, p. 10; Davenport, Redman,

2021). The theoretical significance of the research is to study the content of innovative entrepreneurship, evaluating the effectiveness of business models in the conditions of digitalization (digital transformation). The practical significance and relevance of the paper are due to the need to classify the construction of effective models of innovative business.

The purpose of the paper is to study approaches to building business models of innovative enterprises and companies in Kazakhstan, taking into account the impact of the global pandemic and digital technologies, their impact on entrepreneurial activity in terms of the transformation of its components in the field of marketing, sales channels, and corporate culture management.

2. Materials and Methods

The theoretical basis of the research consists of scientific and methodological, practical and educational works of leading Kazakh, Russian and foreign economists and specialists in the field of management (Safronchuk, 2018, p. 41). The works were studied concerning the actualization problems of the information economy, its formation, and development in the Republic of Kazakhstan. The sources were studied concerning the improvement of the existing infrastructure of the information economy of Kazakhstan. For comparison and analysis, we used innovative entrepreneurship models of Western methodologists such as Slivotsky, Hambrick and Fredrikson, Luikn, Wilsof, and Osterwalder Regulatory legal acts, materials of analytical reports, concepts, programs, strategies, doctrines, and other documents of federal and regional authorities were collected and analyzed. In addition to legislation on innovation, the authors took into account regulations on the support of small businesses, as well as measures to create a network of technology parks, venture firms, and other infrastructure facilities, including small innovation centres.

The authors of the paper turned to the scientific and methodological base of digital economy research for a period of up to 10 years to identify trends in transformation and confirm their hypotheses. Mass media publications of the Republic of Kazakhstan were analyzed concerning innovative activities, innovative enterprises, and interviews with creators of modern technological start-ups, including those during the COVID-19 pandemic, to identify the best practices in the field of innovative development. The methodological basis of this research consists of groups of general scientific and philosophical approaches (systemic, synergetic, materialistic, structural, and functional, and others) and methods (historical, genetic, scientific abstraction, comparative, equilibrium, graphic visualization, and others). The paper used the existing sociological and statistical methods, methods of analogies, system analysis, and modelling.

Different theoretical methods were used to analyze mass media publications, including the method of content analysis using search engines, as well as software (the Medialogia information and analytical system). A meta-analysis was conducted to systematize the integration of available data. In the course of the research, the following were used: theoretical methods; methods of mathematical statistics, and graphical representation of the results. The analysis method was used to analyze the scientific problem into its parts for a detailed study. Synthesis – methods of generalization (a set of similar properties and features

of an object), induction (theoretical study or reasoning from particular to general), and deduction (theoretical study or reasoning from a general thesis to particular conclusions) are used to compile a system of different elements for a large-scale study of processes.

To analyze the effectiveness of business models, the computational and constructive method was used, the method of economic analysis in the format of decomposition of economic phenomena into various parts for a detailed study of their impact on the allocation of resources. The statistical and economic method was used to study statistical data on the effectiveness of digital business models in various business sectors.

The information base of the research includes current regulatory legal acts; monographs and didactic works of leading economists; materials of periodicals; conference materials, collections of scientific articles, abstracts of reports, electronic sources and databases and relevant statistical materials provided by public authorities.

3. Results and Discussion

There are different approaches to understanding innovative business models and their components, as well as the impact of the digital economy on business transformation. Technological advances have had a serious impact on the business environment, contributing to the influence of industrial technologies on digital (Website of the Government of the Republic of Kazakhstan, 2021). This influence is manifested in four main aspects: ways of doing business and its marketing strategy; resource support of activities; formation of production and transaction costs (there is a reduction in costs under the influence of automation and the use of machine technologies); business scale (development towards globalization).

The modern business model of an innovative enterprise is influenced by the above trends, which have a linear effect on all its key components. An approach was proposed to a modern business model of an innovative enterprise as a structural model of interaction of four components: sales and promotion channels; technology; corporate culture; and value (value proposition).

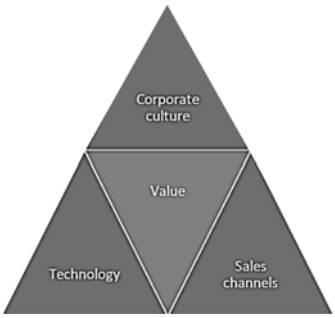
Within this research, it is important to understand the two key concepts of technological entrepreneurship and innovative entrepreneurship. Technological entrepreneurship involves starting new companies based on developing or leveraging new technologies. The focus is on recognizing opportunities enabled by new technologies and bringing innovative new products/services based on those technologies to market. In turn, Innovative entrepreneurship is broader and focuses on introducing any type of new, innovative products, services, or business models. The innovation may or may not be technology-focused. The emphasis is on recognizing opportunities for innovation in all areas and bringing new offerings to market.

Technological entrepreneurship is a subset of innovative entrepreneurship. All technological entrepreneurship efforts involve innovation, but not all innovative entrepreneurship relies on new technology. Technological entrepreneurs tend to have technical backgrounds and focus on opportunities created by emerging technologies. Innovative entrepreneurs may have more varied backgrounds, looking at innovation opportunities in all areas.

Both technological and innovative entrepreneurship aim to disrupt existing markets and value chains by introducing new offerings. Speed in bringing innovations to market before others is key. Success factors for both include identifying truly innovative opportunities enabled by new technologies or changing market conditions, executing quickly before competitors, assembling the right team, and rapid iteration and adaptation.

As part of the study, a graphic image of the business model of an innovative enterprise was formed, including the elements listed above (Figure 1).

Figure 1. Graphic representation of the modern business model of an innovative enterprise



According to the information agency Kazakhstan Today (2021), the World Competitiveness Centre of the International Institute for Management Development (IMD, Lausanne, Switzerland) announced the results of the World Competitiveness Rating 2021. This year, sixty-four states were evaluated in the material. Kazakhstan took 35th place and is ahead of Portugal, Spain, Slovenia, Russia, and Turkey. This year, the Republic has improved its position on all rating factors. More than 40% of Kazakhstan's GDP is accounted for by industry and trade. According to the forecast of the Elim Marketing and Social Research Institute (2021), digital transformation and automation of business processes will accelerate in all spheres in the territory of the Republic of Kazakhstan in the next two years. E-commerce will develop further and will have a significant impact on the transformation of customers' behaviour and development.

Let us consider the business model described above using an example of specific companies in Kazakhstan. Akhter Studio IT company provides a full cycle of creation and development of digital products, starting from research, full-scale release, and ending with full-fledged support and development. The business started with a small product – a postcard generator for a Kazakhstani online store, which the studio made in early 2021. The impact of the COVID-19 pandemic on the global business community has caused an explosive growth of digital products (Patyka et al., 2021, p. 57). The founders of the start-up managed to quickly integrate into this trend. They improved the technology (developed a universal Flutter solution, based on an open framework for developing mobile applications), and worked out sales channels (ensured the integration of the product with the content of the oldest blog platform in Kazakhstan – Yvision.kz). They formulated the value for clients (a simple, convenient, and universal solution). The company pays much attention to its corporate culture and non-material motivation. Thus, we see all four components of the innovative

business model. The coronavirus and the rapid transition to the virtual ecosystem required quick solutions and contributed to the fastest possible introduction of products.

Let us consider the second example – LLP Documentolog. The company is engaged in document management automation. Working in the Kazakhstan market since 2007, the company has repeatedly optimized its business model, as it constantly had to compete with global companies such as Microsoft and IBM. Today it is one of the market leaders, the company's software is used by about 30% of representatives of medium and large businesses in Kazakhstan, 40.000 customers, and more than 300.000 users in Kazakhstan. In an interview with the Probusiness portal, the founder of the company, Baijan Kanafin, lists the key success factors of the company, which are divided into blocks of the business model described in this study.

Value. The company has been building a reputation strategy for years to earn the trust of customers. Modern software, is cheaper than in international competitors, while stable, reliable, and secure.

Technologies. The "cloud" was one of the important stages of technological development. That is, earlier customers bought a license and installed the software on their servers. It was necessary to pay a serious amount for the license, and it was impossible to guarantee a constant cash flow. The transfer of software management to the cloud format allowed for reducing the price for clients, while ensuring that the company receives regular cash on an ongoing basis (Khodakivska and Voronko-Nevidnycha, 2023, pp. 53-54). The transition to the SAAS model (software on demand), that is, installing software on the company's servers and offering clients a service instead of a product, became a technological breakthrough.

Sales and promotion channels. In 2020, the Company made a key decision that allowed it to grow – the transition to the freemium model (free basic functionality and subscription for an additional fee.

Corporate culture. The founder of the company identifies several key aspects of the corporate culture that allows the Company to grow and develop steadily: a competent leader who believes in the idea, a highly professional, enthusiastic, trusting team that trusts the leader, as well as an effective motivation system, constant work on improving the internal corporate culture.

According to the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan (MDDIAI) (Kulikova, Suvorova, 2021, p. 202) to date, Kazakhstan has created a legislative and institutional framework, and infrastructure to systematize work to increase the share of innovative goods, works and services and promote the development of technological entrepreneurship. Constant work is underway to improve legislation based on the best international experience.

In general, the Parliament was provided with legislative initiatives within the framework of the law "On Industrial Policy" to ensure strategic and long-term technological development of priority areas of industry for the systematic expansion of the experience gained in the field of technological development. For this purpose, the main technologies were identified in all industries by conducting technological foresight, technological competence centres and technological platforms were created, as well as targeted technological programs were

developed. For example, there are state innovation support institutions such as the Joint-Stock Company "Centre for Engineering and Technology Transfer", Autonomous Cluster Fund "Park of Innovative Technologies", a subsidiary of a Joint-Stock Company "National Managing Holding", Joint-Stock Company Baiterek QazTech Ventures, the Stimulating Productive Innovation project of the World Bank. The project has been extended for another 2 years, which will invite about $ 5 billion for the development of technology consortia, the creation of competence centres, and the implementation of innovative programs. In addition, the agreements have been extended with the World Bank on the domestic venture fund for early financing to stimulate private venture capital at the initial stages, the total amount of which is about $ 20 million USA.

Innovative grants are a separate direction of the high-tech sphere. This mechanism is codified in Chapter 24 of the Entrepreneurial Code of the Republic of Kazakhstan (Online Zakon, 2015). An innovation grant is understood as budgetary funds provided to subjects of industrial and innovative activity on a gratuitous basis for the implementation of their industrial and innovative projects within the framework of priority areas for the provision of innovative grants. In total, innovation grants were issued to 312 projects, as a result of which about 4 thousand jobs were created, and $ 223.7 billion was allocated. innovative products were sold worth 16.8 billion tenges. Also, subsoil users must allocate 1% of the production costs incurred by them last year to finance innovative projects according to the current legislation. For example, the total sum amounted to about 19 billion tenges raised from subsoil users from 2015 to December 2020. With these funds, 137 projects of the participants of the innovative cluster "Park of Innovative Technologies" for solving technological problems of subsoil users amounted to $ 9.6 billion.

The taken measures aim at forming an innovative ecosystem, new technologies, new industries, new material goods, and important advantages for the country, at creating unique products with high added value. The value component is one of the key components in the presented model since it is the solution to the client's problems, that is, the value proposition, that becomes a source of profit (Shahini et al., 2023, pp. 124-125). The digital economy requires deepening relationships with clients, a sensitive response to their needs, and changing preferences. At the same time, communication becomes mostly virtual, and competition and the value of customer experience grow (Coene, 2021). The value proposition is a fundamental element of the business model, as it forms the business strategy, the format of communication with customers, and the list of sales channels.

Automation helps to reduce costs, but marketing costs increase (Boiko, 2023, p. 51). Cost competition shifts towards the willingness to create non-standard solutions – a creative policy. Big real-time data and digital technologies provide individualization of interaction with customers, which contributes to increasing the brand capitalization of modern innovative enterprises. Most of these algorithms are based on the analysis of cookies, information traces that clients leave when browsing certain sites (Kjellberg, 2021). Electronic devices analyze needs and form personal ecosystems while transmitting their depersonalized data to a digital interactive environment. With their competent application in innovative entrepreneurship, these technologies solve the problem of selecting meaningful information with its abundance for clients (Visser, 2021).

Based on automatically processed information, market segments are formed that allow conveying address information and personalizing it as much as possible. In this aspect, automation and customer relationship management software (CRM) plays a key role in the described component of the business model. In this aspect, digitalization becomes a way of processing information presented in digital form. The maximum difficulty for business is to determine the amount of information, which will result in the maximum effect when processed. Advertising information is improved by artificial intelligence and becomes a personal offer to buyers. The above factors are the basis for the development of innovative business in the Republic of Kazakhstan, thereby increasing the relevance of the effective choice of the business model of innovative entrepreneurship. Technologies penetrate all spheres of business and production - from the development of products and services to breakthrough technologies of enterprise and personnel management. Artificial intelligence is widely used both in software and production. The role of artificial intelligence is great in algorithms that identify the interests and predict the behaviour of customers to design their path (customer development) (Tenyukh et al., 2022, p. 47). Virtual individualization and the deepening of customer relationships require an effective application. Digital technologies form new potential and requirements for the market and accelerate business. Saving transaction costs allows redirecting the released resource to strengthen the technological component of the business model, but at the same time, growing competition often leads to price discrimination in favour of clients, which becomes an additional opportunity (Chernyshova, 2012).

Often innovative products create new markets, affecting all spheres of the economy. The penetration of communication technologies into the economy and everyday life, including the Internet of Things, has become revolutionary. The innovative component of services becomes a decisive factor in achieving market leadership (Leonow et al., 2019). Innovations account for 2/3 of product price reductions in price competition. The business culture changes, on the one hand, it is focused on the overall result and, and the other, on individual mental involvement in the Company. The organizational and leadership ability of staff to learn and its readiness for change becomes extremely important.

The formed graphical model reflects the four key components of the business model of innovative business – sales and promotion channels, technology, corporate culture, and value (value proposition). Modern scientific literature presents various approaches to the construction of business models of innovative enterprises, including the above-listed components, as well as justifies their significance in one format or another (Akhmetzhanova et al., 2023, p. 127). This study is based on data from a literature review, as well as analytical data obtained through theoretical-methodological research. Value and consumer become the central segment of the innovative business model. A. Slivotsky (2006) was the first to identify a consumer-oriented business model consisting of decisions that the company made in eleven areas using the example of Toyota: fundamental business concepts, customer selection, range of activities, source of differentiation, cost recovery, procurement, and production system, the intensity of investment, research and product development systems, organizational structure, mechanism of market entry.

D. C. Hambrick and J. W. Fredrickson (2001, p. 50) formulate five key questions, answering which it is possible to form a business model:

- In what area will we work?
- How will we get there?
- How will we succeed?
- How will we make a profit?
- At what speed and in what order will we act?

The three-dimensional scheme (model) of D. Abell (1980), described in the book "Defining the Business: The Starting Point of Strategic Planning", focuses on the market niche method. In his matrix approach, D. Abell proposed to define the business area in three dimensions: customer segments served (who?); customer needs and problems (what?); product development and production technology (how?). This model is the basis of any company's strategy. Let us illustrate it with an example of e-commerce: the interaction of buyers and sellers. On the seller's side, the internal structure of the online store consists of a front-office (a store's database, a CMS system), and a back-office (a complex of information and communication technologies for data management. These components accumulate the main aspects of the technology. Customer groups served are mainly in the Internet environment, segmented into certain target audiences representing certain values. Thus, digital technology becomes an integral part of the three-dimensional business model. The business model of A. Ostervalder (2017) is of practical interest, consisting of nine blocks: consumer segments, value propositions, sales channels, customer relationships, revenue streams, key resources, key activities, key partners, and types of costs.

In the digital economy, customer relations are characterized by the predominant role of Internet technologies (targeted and contextual advertising, big data) for maximum personalization of the value proposition. In this model, there is an understanding of the importance of human resources as one of the components of the company's key resources. An auction, the sale of goods to a buyer who offered the best price, is an example of the business model in its traditional form. In the digital economy, there is also work on this principle – Google uses the auction model to determine the cost of displaying ads for a particular word or phrase, depending on demand. It should be noted that trade under the conditions of structural market transformations turns into a complex dynamic system, and environmental factors with their positive and negative consequences have a significant impact. The impact of the pandemic and local and global restrictive measures has led to a significant increase in digital business models both in the Republic of Kazakhstan and in the world (Komilova et al., 2023, p. 791). In this regard, it is important to analyze and study the author's approaches to the definition of a digital business model. Digital business models are a form of doing business based on digital technologies. Among the most common templates of digital business models are such as freemium, open sources, platforms, and ecosystems.

Freemium (free and premium). This model appeared in the 1980s in the gaming industry, when all software was distributed under the "shareware" model. The author of this business model is considered to be E. Louis, and Fred Wilson was a populariser (2021). In this business model, a product or service is provided free of charge, and monetization occurs through the sale of additional functions or services. At the initial stage, the functionality of the free version is limited. The second option for using the business model is the free and

paid versions of the software, in which monetization occurs through embedded advertising. The user can use the free product without restrictions, but with mandatory advertising. On average, no more than 10% of buyers purchase premium content, but this segment is enough to monetize the product, which makes this business model liquid. As a rule, the company initially transfers the basic product for free, acquiring a significant number of users, some of whom will potentially move to the premium segment. Examples of companies using this business model template: are Skype, Spotify, Linkedin, MailChimp, and Canva. For example, Dropbox provides free access to 2 GB of cloud storage, but you have to pay for additional storage. The monetization of premium users is realized by subscription or prepayment of services.

The Open Source business model is described in detail by Western researchers. This is a form of monetization where software code becomes available for free to everyone, and any programmer can contribute to the update. This ensures the fastest possible distribution of the product; monetization occurs through the sale of educational programs or the provision of services based on this open-source code (Kulikova, Suvorova, 2021, p. 203). An example is Red Hat, a software manufacturer based on an open-source Linux operating system: Red Hat Enterprise Linux. Software is the key resource of the company and the development of versions, testing, and support of this software is the key activity of the company. Software monetization can also be carried out by organizing subscriptions and support services.

A digital platform is the third digital business model described as a business model in the article. According to the MIT (Massachusetts Institute of Technology) definition, a digital platform (as a business model) is a high-tech business model that creates value by facilitating exchanges between two or more groups of participants. This business model is based on a digital platform (infrastructure platform) as a key resource. Providing consumer segments with access to the platform and managing the platform, its development, and promotion are the key services of the company. Digital platforms create the integration of independent actors from the supply and demand side (individuals or organizations), giving them the opportunity for direct interaction and commerce, the platform guarantees security and creates an institutional and regulatory framework. Monetization can occur both at the expense of one or several consumer segments and, as a rule, is implemented according to the commission payment model. Amazon and eBay marketplaces are good examples of successful digital platforms, initially based on conventional websites. For scaling, work was carried out to create a service-oriented architecture formed from a large number of backend services. McKinsey estimates that 30% of global economic activity ($60 trillion) will be created by platform and ecosystem business models in 10 years. However, only 3% of existing companies use these models. Platforms are most of today's largest IPOs and acquisitions (GitHub, eBay, Instagram, YouTube, Slack, WhatsApp, Uber, Airbnb, Pinterest, Square, Social Finance, Kickstarter, ZocDoc).

The digital platform business model allows for reducing costs both in terms of internal employee interaction and in terms of a new level of interaction between company employees and consumers (Makhazhanova et al., 2022). Interaction with consumers becomes as personalized and omnichannel as possible. The business model itself assumes the exclusion of the human factor since it excludes a person himself as an intermediary. To date, the uberization trend of the economy has been implemented through the replacement of

intermediaries or organizations with digital platforms. The term "Uberisation" comes from the name of the Uber company, an integrator of taxi orders for drivers and passengers. The interaction of many parties is implemented based on a digital platform, which leads to the implementation of network business models (Cando et al., 2014). A digital platform provides clients with flexible delivery of the value proposition. Cost reduction eliminates the problem of inconsistency of interests of subjects of commercial interaction. This business model has a network effect, that is, it becomes even more attractive with an increase in the number of users. This model can be used in any industry and become the key to successful digital transformation. Examples of this template are the business models of Apple, Visa, Google, eBay, Facebook, and Netflix. The digital transformation results in a collaboration between various organizations, the unification of various digital platforms, and a single ecosystem (Hua, Ray, 2018, p. 8; Gaofeng et al., 2021). Gartner defines a Business Model Template - an ecosystem business model (or a digital ecosystem) as an interdependent group of entities (enterprises, people, and things) that share standardized digital platforms to achieve a mutually beneficial goal (World Employment and Social Outlook, 2021).

4. Conclusions

It was established that an innovative modern business model included four main components: sales channels and promotion of products and /or services; technologies both in terms of creating products and /or services and forming an innovative organizational model of enterprise management; corporate culture, a system of work with loyalty and involvement of personnel, orientation to collective results with maximum individual mental involvement in the company culture; value for clients, the most accurate definition of their problem, with the offer of a quick, effective and convenient solution (value proposition).

The technological aspect is mandatory from the point of view of the implementation of the described business model of innovative entrepreneurship. The use of machine technologies is a mandatory technological component, as well as software that systematizes customer interaction (CRM). Big data and their segmentation are of practical importance to personalize offers for customers and their targeted delivery using the capabilities of digital platforms. The targeted delivery of the value proposition to clients is ensured through the continuous improvement of integration information platforms that take into account the interests and preferences of the clients. Digital business models such as freemium, open sources, platforms, and ecosystems can become the most effective from the point of view of monetization as well as promising in terms of implementation in the territory of the Republic of Kazakhstan. Effectively digital business models can be applied for innovative business transformation in such industries as retail sales, entertainment, financial services, and telecommunications. Digital platforms can be the key to the successful digital transformation of enterprises and organizations in most business sectors, to ensure cost reduction and value growth for clients.

This paper can be useful for specialists in the field of strategic management and marketing, Internet advertising, adapting to new conditions of professional activity in the context of digital transformation, for representatives of the business community aimed at business

development. It is of practical importance for choosing a business model for a start-up in the field of innovative entrepreneurship and information technology. In the process of research, new questions and problems have arisen that need to be solved. It is necessary to continue research on the development of a methodology for testing hypotheses of digital business models in a changing external environment with minimizing financial losses and maintaining the stability of innovative enterprises.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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FACTORS AFFECTING SUSTAINABLE GROWTH RATE AND ITS IMPACT ON FINANCIAL PERFORMANCE OF KOSOVO MANUFACTURING COMPANIES[5]

The paper aims to identify the factors affecting the sustainable growth rate of companies over eleven years from 2011 to 2021. The research used panel regression analysis and examined a sample of 92 manufacturing companies operating in the market of Kosovo. This study used a pooled OLS regression model to investigate the variables affecting sustainable growth rate (SGR). According to the research, SGR has a negative significant impact on profitability (ROA), liquidity (LIQ), and equity ratio (TETA). However, there was a positively statistically significant relationship between SGR, asset efficiency (STA), capital structure (TDTE), and sales growth (SG). These findings provide insight into the important factors influencing the study environment's sustainable growth rate. The findings, according to the study, can be used by management to build and implement long-term growth strategies. Businesses can improve their operations, and align them with the objective of sustainable growth by considering the impact of the identified variables. It also provides for a more accurate evaluation of the company's financial success and long-term performance. The study's findings have practical implications for a wide range of stakeholders, including corporate executives, investors, financial institutions, and researchers. All of these groups can use the knowledge provided to make better decisions and support sustainable development rates.

Keywords: Manufacturing Companies; Sustainable Growth Rate; Financial Performance; Kosovo
JEL: N60; O47

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1. Introduction

The fastest rate at which a business may grow and boost earnings without needing to look for extra finance through strategies like issuing more shares or taking on more debt is known as the "sustainable growth rate of the company". The company's strategic decisions are guided by this rate, which shows the equilibrium between financial prudence and expansion. If a company's growth rate falls below what is considered sustainable, it is possible that it could stagnate, lose its competitive advantage, and, in the worst-case scenario, go bankrupt. If a company's development rate exceeds its capacity for sustainable expansion, it may face financial difficulties, a lack of liquidity, and, finally, insolvency. A company can finance rapid expansion through a variety of internal and external sources. While external alternatives might have to deal with mounting debt or recapitalization through the issuance of new shares, internal alternatives might concentrate on improving production effectiveness, total asset turnover ratios, and all of its component aspects.

To maximize growth rates without increasing the company's debt or issuing more shares, it is essential to have a sustainable growth rate (SGR), which is regarded to have a significant impact on how well a company succeeds. Businesses utilize SGR as a crucial statistic to evaluate their profitability. The highest platform or benchmark required for a corporation to raise its profits without utilizing less money, according to Higgins (1977), is sustainable growth. Factors include the earnings retention rate and return on equity. To create a single indicator of a firm's financial performance measurement for each production firm, profit margin and business efficiency can be integrated with financial factors like capital structure and retention ratio. SGR must be evaluated using particular performance indicators for enterprises. The elements influencing a company's SGR can be identified to describe these metrics and assist stakeholders in making the right choices. The four factors that affect SGR are the dividend policy, finance policy, asset turnover ratio, and profitability ratio, according to Hartono and Utami (2016). Precise performance metrics can be produced by identifying the factors that influence a firm's SGR, which will help stakeholders, management teams, and customers make the best decisions for the company.

Several variables that slow the rate at which company resources are recovered may have an impact on Kosovo's economy, particularly the industrial sector. As a result, good resource management is necessary, with working capital serving as the most critical resource. While Kosovo's retail industry contributes to GDP, manufacturing companies only accounted for 14.3% of the country's total number of firms in 2019 while employing 16.3% of all workers, according to data from the Kosovo Agency of Statistics. According to data from 2022, the manufacturing sector, which employed 17.02% of all people, accounted for 13.2% of the economic sectors' turnover structures. These figures demonstrate that, although receiving insufficient attention, the manufacturing sector is critical to a country's economy, and that working capital management and business profitability are especially vital in this area. This essay will analyze the pace of sustained expansion of the production sector in Kosovo. Along with the research findings of numerous worldwide writers, the methodology for calculating the sustainable growth rate is offered from a theoretical standpoint of identifying the research subject.

The following is how the paper is organized: Following an introduction to the topic of the research in the first section, the second section investigates the effects of financial performance on the sustainable growth rate of Kosovo SMEs and provides a literature review that gathers relevant studies. The third section contains information regarding the study's data collection and analysis methods. The fourth section of the article, which focuses on empirical data, investigates the impact of financial performance on the sustainable growth rate of SMEs operating in Kosovo in depth. The fifth section explains the conclusions and their economic significance in greater detail, as well as how the initial ideas were evaluated. The sixth section, Conclusion, summarizes the study's goals, goes into further detail about its findings and contributions to the field of science, offers applications, and makes suggestions.

2. Literature Review

The concept of sustainable growth rate (SGR) has its reference to Babcock (1970), who provided a simple explanation of the behaviour of various elements of sustainable growth rate later on, Higgins (1977) expanded this idea. He demonstrated how many companies' financial plans might not be in line with their expansion objectives. He recommended utilizing the Sustainable Growth Rate (SGR), which is the maximum rate of sales growth that a business can achieve while maintaining a stable set of financial guidelines. According to him, the Sustainable Growth Rate, is the highest rate at which a company's sales can expand without exhausting its financial resources. According to him, the fastest a company can increase revenue without exhausting its financial resources is considered to have an SGR in a business environment. Given that it integrates the operating (profit margin and asset efficiency) and financial (capital structure and retention ratio) aspects of a company into one indicator, it is viewed as being valuable.

Martin and Johnson (1981) further developed Higgins' study of sustainable growth by categorizing the behaviour of assets and liabilities in an inflationary environment. Platt, Platt, and Chen (1995) created a formula that indicates the maximum growth that may be attained if companies do not take out loans from the market in order to maintain a target capital structure, building on Higgins' research on the sustainable growth rate for businesses in financial crisis. In these conditions, their suggestion is to calculate the sustainable growth rate by simply multiplying the profit margin by the return on assets.

While updating it slightly, Ashta (2008) maintained the validity of Higgins' SGR model. The study concludes that SGR needs to be assessed with the same leverage ratio. Only by dividing total assets (opening) by equity can one determine SGR (opening). Paying attention to the mathematical part of the model, we need to modify the alteration mentioned above. Specifically, we need to change the ratio of total asset turnover to sales divided by total asset opening instead of total asset ending as Higgins had projected. The sale of an asset becomes more natural as it is devoured by the opening of a current asset, and a new inducement of an asset yields profit in the form of future gains, it was also discovered. The growth rate will stabilize with the utilization of sales, regardless of the ratio of financial leverage and asset openness in asset turnover (Ryabova and Samodelkina, 2018; Steblyanskaya et al., 2019; Ponce et al., 2021).

A company's SGR must be evaluated using certain performance metrics. To aid stakeholders in making the best decisions, these measurements can be explained by identifying the variables that have an impact on the firm's SGR. Profitability, asset efficiency, and financial constraints must all be considered in this situation because they are key elements that may affect the company's ability to grow sustainably.

The effect of financial performance on SGR has been examined by several authors. Lim and Rokhim (2021) found that profitability, as measured by return on assets, return on equity, and earnings per share are strongly and favourably correlated with SGR, except for profits per share. As a result, businesses with greater success would have higher SGR. Similarly, over the past ten years, research on the relationship between ROE components and the sustainable growth rate (SGR) has developed (Wahyuni and Dino, 2016; Manaf et al., 2018; Alberto et al., 2019; Nastiti et al., 2019). According to several studies, the SGR and ROE components are significantly positively correlated (Hafid 2016; Rahim 2017; Mukherjee and Sen, 2018).

The ratio of capital structure and return on capital as a measure of profitability was analyzed by (Amouzesh et al., 2011; Ali et al., 2017; Chandra et al., 2019) indicating that capital structure does not affect the equity returns of companies. (Yang et al., 2010; Dzikevičius and Šaranda, 2011; Lyroudi, 2018) analyzed the ratio of asset turnover and return on equity, finding that asset turnover does not have any significant impact on equity growth. According to other studies, financial leverage has little effect on ROE, but asset turnover and profit margin do (Raza and Farooq 2017; Warrad and Nassar 2017). Vintila and Duca (2012), on the other hand, concentrated on the effect of financial leverage on ROE and came to the conclusion that an increase in financial leverage increased a firm's profitability as measured by ROE.

Some additional authors examine the effect of business size on the SGR. Researchers (Xu and Wang, 2018; Wang et al., 2019) discovered a strong and positive association between the SGR and the size of the company, but (Huang et al., 2019; Mamilla, 2019) reported opposite results regarding the effect of companies size on SGR. They discovered that firm size is highly detrimental and hypothesized that the larger the value, the less likely it is for a corporation to experience sustained growth. On the other hand, Pouraghajan et al. (2012) discovered a high direct association between firm growth potential with ROE and the ratio of tangible assets to equity, company size, and total assets turnover. Almaqtari et al. (2019) also observed a strong correlation between the asset management ratio and ROE.

Regarding leverage ratio and SGR association, some studies have discovered that debt leverage significantly increases the firm's SGR (Rahim, 2017; Pratama 2019; Mumu et al., 2019). The debt leverage has a favourable impact on the growth of the firm since it causes the sustainable growth rate of the company to climb when financial leverage rises and to fall as it falls (Srinivasa, 2011). The company's financial leverage rises as its debt ratio rises. As a result, more resources will be made accessible, accelerating the company's rate of sustainable growth. Asset management efficiency and SGR relationships are being investigated (Rahim 2017; Subbaredy and Reddy 2017; Mukherjee and Sen 2018). The authors determined that the most efficient asset management had a beneficial impact on SGR. Furthermore, Anderson et al. (2010) establish evidence of a substantial connection between

sales growth and SGR by assessing the SGR of privately held retail firms based on the growth cycle stages. The relationship between trade credit finance and sustainable growth at the business level is examined by Huang et al. (2019). They discovered that trade credit financing had a considerable and positive impact on a firm's total capacity for sustainable growth, particularly for those with stronger internal control systems.

To summarize, the research suggests that financial success affects a company's sustainable growth, but there are still differing opinions on the best variables to use as a proxy for financial performance and sustainable growth. This study explores the hypothesis of a linear link between financial performance and the sustainable growth rate of manufacturing enterprises in Kosovo, which is consistent with prior empirical studies on the subject.

Following consideration of the previously mentioned study, the following hypothesis was developed:

Hypothesis 1: Profitability as measured by ROA has a statistically significant positive impact on manufacturing companies' sustainable growth rate.

Hypothesis 2: Liquidity has a statistically significant positive impact on manufacturing firms' sustainable growth rate.

Hypothesis 3: Asset efficiency has a statistically significant beneficial impact on manufacturing firms' sustainable growth rate.

Hypothesis 4: The equity ratio has a statistically significant negative impact on the sustainable growth rate of manufacturing companies.

Hypothesis 5: Capital structure has a statistically significant negative impact on manufacturing companies' sustainable growth rate.

Hypothesis 6: The company's sales growth has a statistically significant positive impact on the sustainable growth rate of manufacturing companies.

3. Research Methodology and Model Specification

The definitions of dependent and independent variables are defined in Section 3. Ninety-two industrial firms in Kosovo from 2011 to 2021 make up the sample. The sample consisted of active private production enterprises that were large, medium, and small in size. The percentage of large businesses is lower in Kosovo's production sector, where the bulk of organizations are medium-sized and smaller. Particularly among the secondary data sources included in the study are audited financial statements. Since the sample includes data from several companies that reoccur over time, panel regression analysis was applied. The Kosovo Financial Reporting Council, company websites, and other sources are some of the data sources. We have identified a number of crucial elements in our research that affect the sustainable growth rate, based on past investigations. These factors are profitability, liquidity, asset efficiency, equity ratio, capital structure, and firm growth. Firm size and taxes are control variables. Some factors' effects were examined as well before we selected our study's independent variables, but they had little bearing. The factors included in the model are also

the ones that have the biggest potential impact on SGR, as determined by a thorough analysis of numerous similar studies. With the help of SPSS and multiple regression analysis, we have compiled and examined these determinants.

- We have utilized descriptive statistics to describe the variables, which include measurements such as the minimum, maximum, mean, and standard deviation values of both the independent variables and the dependent variables.
- To assess the strength of the relationships between the dependent and independent variables, we have used the Pearson correlation test. This test helps determine the extent of the linear association between two variables.
- To check for multicollinearity among the independent variables, we employed the variance inflation factor (VIF). The VIF examines whether there is a high correlation between independent variables, which can affect the reliability of regression results.
- For analyzing the critical components that contribute more to evaluate sustainable growth rate analysis, we have conducted a linear regression analysis. This analysis helps identify the relative importance of each independent variable in explaining the variation in the dependent variable.

The Sustainable Growth Rate (SGR) of production companies in Kosovo serves as the dependent variable in this context. According to the following studies (Mukherjee & Sankar, 2017, Sahin & Ergün B., 2018, Sunardi et al., 2021):

$$SGR = ROE * \left(\frac{b}{1}\right) - (ROE\ x\ b)$$

where:

b = The retained earning rate in year t

ROE= Return on equity (net income/owner's equity) in year t.

The association between the SGR and the firm's performance accounting indicators of Kosovo production companies is investigated using the following multiple regression model, which will be as follows:

$$SGR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 LIQ_{it} + \beta_3 STA_{it} + \beta_4 TETA_{it} + \beta_5 TDTE_{it} + \beta_6 SG_{it} + \beta_7 SZ_{it} + \beta_8 Tax_{it} + \varepsilon \quad (1)$$

Table 1. Operationalization of all variables

Variables	Symbols	Proxy
Dependent variable		
Sustainable growth	SGR	Return on equity / The rate of earnings retention
Independent variables		
Profitability	ROA	Net Profit / Total Assets
Current Liquidity	LIQ	Current assets / Current liabilities
Asset Efficiency	STA	Sales / Total Assets
Equity Ratio	TETA	Total Equity / Total Assets
Capital Structure	TDTE	Total Debt / Total Equity
Sales Growth	SG	(Sales $_t$ – Sales $_{t-1}$) / Sales $_{t-1}$
Control Variables		
Firm Size	SIZE	Natural logarithm of total assets
Tax Rate	Tax	Profit Tax / Pre-Tax Profit

4. Empirical Results

4.1. Descriptive statistics

For characteristics of manufacturing enterprises in Kosovo from 2011 to 2021, Table 2 offers descriptive statistics and a normality assessment. For variables such as the sustainable growth rate (SGR), profitability (ROA), liquidity (LIQ), asset efficiency (STA), equity ratio (TETA), capital structure (TDTE), firm growth (FGr), Size (SZ), and Taxes (TAX), the mean, standard deviation, minimum, and maximum values are presented. Notably, the businesses had an average SGR of -0.102, ROA of 0.091, LIQ ranging from 0.100 to 14.600, and STA ranging from 0.057 to 5.330. The average values for TETA and TDTE were 2.826, and 3.945, respectively. The standard deviations for Size and Taxes, respectively, were 1.158 and 2.598, respectively, while the SG varied from – 0.727 to 6.312.

Table 2. Summary statistics of the variables

Variable Typology	N	Minimum	Maximum	Mean	Std. Deviation
SGR	1,012	-8.700	0.300	-0.102	0.810
ROA	1,012	-0.437	1.672	0.091	0.176
LIQ	1,012	0.100	14.600	1.280	1.390
STA	1,012	0.057	5.330	1.001	0.765
TETA	1,012	1.018	59.028	2.826	4.198
TDTE	1,012	.0187	152.451	3.945	12.663
SG	1,012	-0.727	6.312	0.111	0.394
SZ	1,012	6.900	12.200	9.760	1.158
TAX	1,012	-4.000	50.400	0.474	2.598

Source: Authors' calculations.

Depending on several variables, including industry benchmarks, corporate objectives, and particular settings, one can judge whether the figures in Table 2 are good or poor. Without additional context and comparison to pertinent criteria, it is challenging to label the data as good or negative. Based on these numbers, it would be necessary to do more analysis and comparison to assess the performance of Kosovo's manufacturing firms.

4.2. Correlation analysis

The findings of the SGR correlation with all the variables and all p-value correlations are reasonably low, as shown by the Pearson correlation results in Table 3. This indicates that there are no claims of multicollinearity issues as a correlation value greater than 1.00 and less than -1.00, indicates the presence of a multicollinearity issue between the variables. The results of the correlation analysis, which is based on the relationship between the dependent and independent variables, are shown in Table 3. This point demonstrates the interdependence of all explanatory variables. To put it another way, this is an attempt to avoid the issues related to multicollinearity. As expected, all correlations between the independent variables are less than 1.00. As a result, there appear to be suspicious instances of multicollinearity influencing the research variables. The variance inflation factor (VIF) of the predictor variable should not be larger than 5 to rule out multicollinearity, even if Assfaw

(2020) accepts a VIF of greater than 10. The reciprocal of the VIF in our investigation is more than 0.20. These figures indicated the lack of multicollinearity.

Table 3. Pearson correlation matrix

Variable	SGR	ROA	LIQ	STA	TETA	TDTE	SG	SZ	TAX	Tolerance	VIF
SGR	1										
ROA	-.136** .004	1								0.459	2.178
LIQ	.031 .520	-.126** .008	1							0.873	1.145
STA	.021 .653	.202** .000	-.151** .002	1						0.831	1.204
TETA	-.350** .000	-.010 .829	.004 .926	-.042 .384	1					0.581	1.722
TDTE	-.522** .000	-.053 .269	-.077 .105	-.074 .120	.291** .000	1				0.622	1.607
SG	-.013 .779	.617** .000	-.056 .241	-.073 .125	.026 .582	-.048 .320	1			0.201	4.974
SZ	.024 .621	-.135** .005	-.009 .852	-.189** .000	-.122* .010	.156** .001	-.083 .081	1		0.925	1.081
TAX	-.042 .376	.410** .000	-.077 .106	-.049 .309	-.038 .422	-.022 .648	.886** .000	-.057 .236	1	0.214	4.675

***.Correlation is significant at the 0.01 level (2-tailed).*
Source: Author elaboration.

The correlation between a firm's sustainable growth and six independent variables and two control variables shows that the sustainable growth rate (SGR) is significantly adversely connected with profitability (ROA), equity ratio (TETA), and capital structure (TDTE) at a 1 percent level. Return on Assets (ROA) is significantly adversely connected with LIQ and SIZE but positively correlated with STA, SG, and TAX. Liquidity (LIQ) and STA have substantial negative correlations, while asset efficiency (STA) has significant positive correlations with SIZE at the 1% level. size (SZ) and asset efficiency (STA) are inversely correlated at 1%. At the 1% level, equity ratio (TETA) and capital structure (TDTE) have a positive correlation; however, at the 5% level, SIZE has a negative correlation. Capital structure (TDTE), at the 1% level, has a positive correlation with SIZE, while SG has a positive correlation with TAX.

4.3. Regression results

The regression model employed in the current investigation is summarized in Table (4) below. It reveals an R Square value of 0.177, indicating that the model's independent variables explain 17.7% of the variation in the dependent variable. The study's independent factors explain 82.3% of the variation in the dependent variable.

Table 4. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. error of the Estimate	Durbin-Watson	F	Sig.
1	0.421[a]	0.177	0.162	0.742	1.541	11.582	0.000

a. Predictors: (Constant), SG, TETA, SZ, STA, LIQ, TDTE, ROA, TAX
Dependent Variable; SGR

Table (5) below illustrates that there is a considerable effect of SGR and independent variables, as seen by the F-count value of 11.582 and the outcome with a significant value of 0.000 at 1% or 0.01. This demonstrates that combining SGR can aid in enhancing the company's potential to create corporate profits in Kosovo production businesses.

Table 5. Regression analysis

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	const	−0.719	0.332	−2.161	0.031**
	ROA	−1.467	0.296	−4.943	0.000***
	LIQ	−0.047	0.027	−1.738	0.083*
	STA	0.121	0.050	2.396	0.017**
	TETA	0.907	0.182	4.964	0.000***
	TDTE	−0.011	0.005	−1.985	0.047**
	SG	0.952	0.253	3.755	0.000***
	SZ	0.020	0.031	0.650	0.515
	TAX	−0.100	0.032	−3.107	0.002***

*Notes: ***p < 0.01; **p < 0.05; *p < 0.10*
Source: Own compilation.

The provided information describes the results of a pooled OLS (Ordinary Least Squares) model analysis, where certain variables are used to explain the variation in the sustainable growth rate. The explanatory (independent) variables used in the analysis include return on assets, liquidity, asset efficiency, equity ratio, capital structure, and firms' growth. Two control factors (firm size and taxes) were also considered. A control variable is any variable that is held constant in a research endeavour. It is not a study variable of interest, but it is controlled because it may influence the outcomes.

Looking at the individual variables, the variable **Profitability (ROA)** has a statistically significant negative impact on the SGR. The regression coefficient of -1.467 indicates that a one-unit increase in ROA leads to a decrease of 1.467 units in the SGR. This relationship is significant at the 1% level, as indicated by the very low p-value (0.000) and the t-ratio of -4.943 reinforces the importance of this relationship. Therefore, based on the findings provided by the model, there is no support to prove the hypothesis (H1) that ROA has a statistically significant positive impact on SGR for manufacturing companies. This is supported by research conducted by Nugroho (2020) which concluded that profitability reports have a significant negative effect on sustainable growth rate. This implies that highly profitable corporations may face reduced long-term growth rates, possibly as a result of variables such as cautious financial practices or restricted investment prospects in the

industry. The findings of the studies conducted by authors Amouzesh (2011) and Hartono and Utami (2016) are contrary to our conclusions.

Regarding the impact of **liquidity (LIQ)** on the sustainable growth rate, the study shows that LIQ has a negative significant impact on SGR at a 10% level. The regression coefficient of -0.047 suggests that a one-unit increase in liquidity leads to a 0.047-unit decrease in SGR. However, the p-value of 0.083 and the t-ratio of -1.738 indicate that this relationship may be the result of chance. Based on these findings, there is insufficient support to prove the hypothesis (H2) that current liquidity has a statistically significant positive impact on SGR for manufacturing companies. This result supports the research done by (Amouzesh et al., 2011; Rahim, 2017; Esen and Ozsozgun, 2018) in which current liquidity does not affect the SGR but is not supported by (Hartono and Utami, 2016). Such a finding goes beyond the general economic rule according to which the higher the liquidity, the greater the possibilities for sustainable growth. The reason may lie in the purchase and sale with a payment term, which according to the accrual principle of accounting, is recognized as a current asset as well as a current liability, but that, on the other hand, businesses may have limited ability to pay due to the non-collection of accounts receivable, which may affect the level of creating sustainable growth for manufacturing businesses. Also, a negative association between liquidity and SGR may be discovered by a firm that is overly concerned with maintaining high levels of liquidity and may miss out on investment opportunities, resulting in a lower SGR. Allocating a large number of current assets to short-term investments may limit the company's ability to utilize these resources for growth-generating operations.

The variable STA, representing **asset efficiency**, does have a statistically significant impact on the SGR at a 5% level. The regression coefficient of 0.121 suggests that a one-unit increase in asset efficiency leads to a 0.121-unit increase in the SGR. However, the p-value of 0.017 and the t-ratio of 2.396 indicate that this relationship is significant. Therefore, based on these findings, there is evidence to support the hypothesis (H3) that asset efficiency has a statistically significant positive impact on the sustainable growth rate of manufacturing companies. This result supports the research from (Nuswandari, 2009; Rahim, 2017; Platt, Platt, & Chen, 1995) but does not support the research from Wirajaya (2013).

The study reveals that the TETA variable, which represents the **equity ratio** or leverage factor, has a statistically significant positive impact on SGR. The regression coefficient of 0.907 suggests that a one-unit increase in the equity ratio leads to a 0.907-unit increase in SGR. The association is significant at the 1% level, as indicated by the very low p-value of 0.000 and the t-ratio of -4.964. In some circumstances, the equity ratio and SGR may have a positive connection. This suggests that a higher equity ratio, or a higher share of debt in a company's capital structure, is linked to a higher Sustainable Growth Rate. Companies with higher levels of debt may be able to use the extra funds to invest in new growth prospects, expand operations, or purchase new assets that contribute to revenue growth. Based on the information provided, the analysis does not support the hypothesis that "Capital ratio has a statistically significant negative impact on the sustainable growth rate of manufacturing companies". This result supports the research from (Mardiyati, Umi dan Ahmad, 2012; Haryanto, 2014; Utami, Muthia, & Thamrin, 2018; Esen and Ozsozgun, 2018), but it does not support the research from Wianta & Wibowo, 2017) saying that TETA has no significant effect to the SGR.

The variable TDTE, representing the **capital structure,** also has a statistically significant negative impact on the SGR. The regression coefficient of -0.011 suggests that a one-unit increase in the capital structure leads to a decrease of 0.011 units in the SGR. This relationship is significant at the 5% level, as indicated by the p-value of 0.047 and the t-ratio of -1.985. Based on the provided information, the analysis supports the hypothesis (H5) that capital structure has a statistically significant negative impact on the sustainable growth rate of manufacturing companies. The finding collaborates with Shehryar (2017) and Ngoc and Anh (2020). Still, it contradicts that of Suleiman and Ahmed (2016), Merugu, and Ravindar (2016), who confirmed no causal relation between capital structure and sustainable growth rate.

The study finds that the variable SG, representing companies' **sales growth**, has a positive statistically significant impact on the SGR. The regression coefficient of 0.952 suggests that a one-unit increase in company size leads to a 0.952-unit increase in the SGR. Also, the p-value of 0.000 and the t-ratio of 3.755 indicate that SG has a highly significant impact on SGR. Therefore, based on these findings, there is sufficient evidence to support the hypothesis that the company's sales growth has a statistically significant positive impact on the sustainable growth rate of manufacturing companies. This result is consistent with Kijewska (2016), which states that if growth exceeds the financial resources needed to maintain its SGR, the company does not need to seek additional financing either through retained earnings (internal financing) or through issuing new shares or borrowing (external financing), but not in line with Nugroho (2020).

5. Conclusions

The primary purpose of this research was to examine the factors influencing sustainable growth rates and their impact on the financial performance of Kosovo's manufacturing enterprises. This paper is considered a new contribution to the related literature since it addresses a highly significant topic that has not been well researched, particularly in the Kosovo market as a growing and emerging market. Using panel data, the OLS model was found to be the best model for examining the effect of the sustainable growth rate.

The empirical results show that there are statistically significant negative connections between the SGR and the firm's profitability, liquidity, and capital structure, implying that enterprises with lower profitability, liquidity, and capital structure have a higher sustainable growth rate. In addition, the SGR has a statistically significant positive link with asset efficiency, equity ratio, and sales company growth. The more the asset efficiency, equity ratio, and sales growth, the greater the firm's sustainable growth rate.

According to the research, Kosovo manufacturing firms should monitor and plan their levels of profitability, liquidity, and capital structure to manage their business and grow sustainably and achieve their long-term objectives. In light of these findings, it is advised that manufacturing firms, in particular, boost profitability and liquidity in order to raise SGR. Additionally, the study recommends that to attract potential investors and attract and enhance international investments, the financial regulatory authorities should compile a database of listed manufacturing businesses in Kosovo based on their rate of sustainable development,

so that they may decide whether or not to invest after having access, particularly to the financial data. Based on the study's findings, we further advise researchers to retest the study models by applying them to comparable markets, utilizing either the same or a different statistical methodology, comparing the outcomes, and highlighting any glaring variations between such marketplaces.

Regarding the limitations, the absence of a working database for the gathering of financial data posed a significant barrier to a detailed analysis of its possible boundaries. Because gathering them by hand from the Kosovar Council for Financial Reporting website has been labour-intensive and unproductive, the work hasn't been as appealing. Expanding the analysis's scope to include a wider range of financial and non-financial aspects is crucial for future research projects. A more thorough grasp of the topic can be provided by this enlarged viewpoint. More companies should be included in the study, and researchers should concentrate on growing the sample size. The robustness and reproducibility of the research findings are improved by a larger and more diverse sample.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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DETERMINANTS OF THE TRIANGLE MODEL ON FRAUD FINANCIAL REPORTING WITH INSTITUTIONAL OWNERSHIP AS A MODERATION VARIABLE[5]

The goal of this study is to use the triangle theory to investigate the characteristics that support fraudulent financial reporting. In this study, the dependent variable is false financial reporting, and the independent variables are pressure, which is a proxy for personal financial need and opportunity, which is a proxy for industrial nature, rationalization, and institutional ownership. Because they include numerous units and time periods, the data used fall under the time series and cross sections category. 17 businesses that are included in the 2017–2021 Sri Kehati stock index serve as the sample. The findings demonstrated that Personal Financial Need (OSHIP) had a negative and significant impact on fraudulent financial reporting, whereas the Nature of Industry (REV) had no impact.
Keywords: fraudulent financial report; fraud triangle; institutional ownership
JEL: G32; G02; M1; G34; Z1

1. Introduction

Financial reporting fraud is a type of fraud that is familiar to auditors who conduct general audits (opinion audits). According to Hidayat et al. (2022) fraud, related to the presentation of financial reporting, is a top priority for the attention of auditors, the public or non-governmental organizations, but is not a concern for forensic accountants. The actions taken by officials or executives of a company in fraudulent financial reporting are to manipulate financial reports that aim to cover up actual financial conditions so that financial reporting

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looks good and profitable (Association of Certified Fraud Examiners, 2020). An example of a case of fraudulent financial reporting is PT. Garuda Indonesia Tbk. Garuda Indonesia claims to record brilliant financial performance in 2018, with a net profit of 11.33 billion. However, the two company commissioners refused to sign the financial statements because they suspected there were irregularities in recording transactions in order to polish the 2018 financial statements. The two commissioners agreed that one of the cooperation transactions with PT. Mahata Aero Teknologi, a start-up company providing on-board wifi technology, which is required as revenue by management.

Fraud is unlikely to occur if there are no things that make someone commit the fraud. If a company wants to avoid fraud, then the company must find out and analyze what things can motivate someone to commit fraud. The above cases prove that there is an imbalance of information between investors and management which provides an opportunity for management to commit fraudulent financial reporting. The theory of fraud used to determine that a company is likely to experience fraud is the polemic theory put forward by Cressey in 1953 in Dorminey et al. (2012) and Skousen et al. (2009) which states that pressure, opportunity and rationalization can encourage fraud occurs. The adoption of the triangle theory is supported by professional accountants, academics and various institutions (Skousen et al., 2009). The purpose of issuing SAS No. 99 is that the auditor's effectiveness increases in detecting fraud by assessing the company's fraud risk factors. Research on this theory has been carried out by Skousen et al. (2008) which tested the effectiveness of the adoption of the fraud risk factor framework by Cressey in SAS No. 99 (Widarti, 2015).

The implementation of good corporate governance practices can increase compliance and improve company performance, so good corporate governance practices can prevent fraudulent financial reporting in companies, which affects the high impact of the fraud triangle on fraudulent financial reporting. Researchers measure corporate governance with institutional ownership because the presence of institutional ownership is considered an effective control mechanism for any decision made by managers, and in addition, the effect of institutional ownership indicates a strong governance mechanism in monitoring corporate governance performance (Ibrahim et al., 2022; Kalbuana et al., 2023).

Research related to the causes of fraudulent financial reporting with the triangle theory has been carried out by Tiffani et al. (2009); Rengganis et al. (2019); Surjaatmaja (2018) where the results of the research are pressure has an effect on fraudulent financial reporting, while Puspitha & Yasa, (2018) states that pressure has no effect on financial statement fraud, Rengganis et al., (2019); Budiyono & Arum (2020); Rohmatin et al., (2021) states that opportunity has an effect on fraudulent financial reporting, inversely proportional to the results of research from Budiyono & Arum (2020) which states that rationalization has an effect on fraudulent financial reporting, whereas according to rationalization has no effect on fraudulent financial reporting (Rengganis et al., 2019; Rohmatin et al., 2021).

Institutional ownership is unable to moderate the effect of Personal Financial Need (OSHIP) on fraudulent financial reporting, research results from Sembiring & Trisnawati (2019); Ibrahim et al. (2022); Apriliana & Agustina (2017), inversely proportional to the results of research from Budiharjo et al. (2020) which states that institutional ownership is able to moderate the influence of personal financial need on fraudulent financial reporting.

Institutional ownership is not able to moderate the influence of industry characteristics (REV) on fraudulent financial reporting (Murtado et al., 2022). In contrast to the results of research from Wulandari & Maulana (2022), institutional ownership is able to moderate the influence of the nature of industry on fraudulent financial reporting. Institutional ownership is not able to moderate the effect of rationalization on fraudulent financial statements. This research is supported by Wulandari & Maulana (2022) and Murtado et al. (2022), this is different from the results of research from Liu & Wu (2020) that institutional ownership is able to moderate the effect of rationalization on fraudulent financial statements.

In accordance with the description above as well as the phenomena and research gaps, the results of previous studies still have many inconsistencies. This study has differences from previous researchers. This study uses a sample of companies listed on the Sri Kehati stock index. Research on these samples has not been carried out by previous researchers. This research examines financial targets, ineffective monitoring, and auditor turnover. The moderating variable of institutional ownership is proxied by the audit committee because it is considered to have an influence on fraudulent financial reporting.

2. Literature Review and Hypothesis

2.1. Agency Theory

According to Eisenhardt & Eisenhardt (2018), there are three assumptions in the agency theory of human nature: first, humans are generally more concerned with themselves (self-interest), secondly they have limited thinking power about perceptions of the future and finally, humans always avoid risks Uzliawati, et al. (2023). The third reason is human nature whose reliability cannot be guaranteed and the information conveyed sometimes does not match the real conditions so that in general it can be said that information is asymmetric (Kalbuana et al., 2022; Taqi et al., 2021; Uzliawati et al., 2023).

This theory is basically used to align between the goals principal with the agent. However, in reality, the goals between the principal and agents often clash. Mekling (1976) and Kalbuana et al., (2023) further explained with this conflict of interest, it is possible for it to occur some actions that are intentional as opportunistic attitudes (opportunistic behaviour) within the scope of management companies like: a) The amount of uncollectible accounts (bad debt) is reported in nominal terms bigger than it really is; b) The amount of sales results is reported with a modest increase significant; c) The emergence of the need for additional funds to the principal for support the implementation of ongoing projects; d) Preparation of multiple financial reports made as needed by company management officials

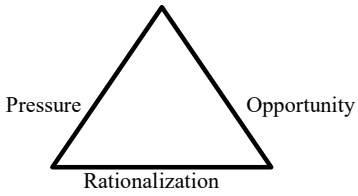
The implication in question is that if the delegation of authority is given from the principal to the management is not carried out properly, then the problem of cheating will occur (Jannah et al., 2020; Luwihono et al., 2021). Improper authority management as the recipient of authority from the principal will utilize existing opportunities/opportunities/gaps in order to fulfil interests and objectives personal with actions that are not justified, As for the interests or Management's personal goals can arise from a variety of factors (Abadi et al., 2021; Aliyyah et al., 2021; B. Endarto et al., 2021; Budi Endarto et al., 2021). If Referring to the

context of fraud, the basic things that need to be known are fraud theory. Fraud theory discusses several aspects that are considered to be triggers for the emergence of fraud. So this is what comes next agency theory can be integrated with fraud theory.

2.2. Fraud Triangle Theory

Fraud triangle theory or in other words the fraud triangle which is the basic theory regarding the causes of fraud. This theory was first put forward by Cressey (1953) and it can be concluded that there are three conditions of fraud namely pressure, opportunity and rationalization (Kalbuana, Kusiyah, et al., 2022; Prasetyo et al., 2021). According to SAS No. 99 in Kayoi (2019), there are four general types of conditions that occur under pressure, these conditions are financial stability, financial targets, personal financial need and external pressure. Opportunities often occur due to weak internal accounting system controls, inefficient management oversight, or deviation and abuse of position and automation. This condition can be carried out by anyone and at any time, so it requires supervision of the organizational structure from the top level to the lower level (Skousen et al., 2009).

Figure 1. Triangle fraud



Source: triangle (Cressey, 1953).

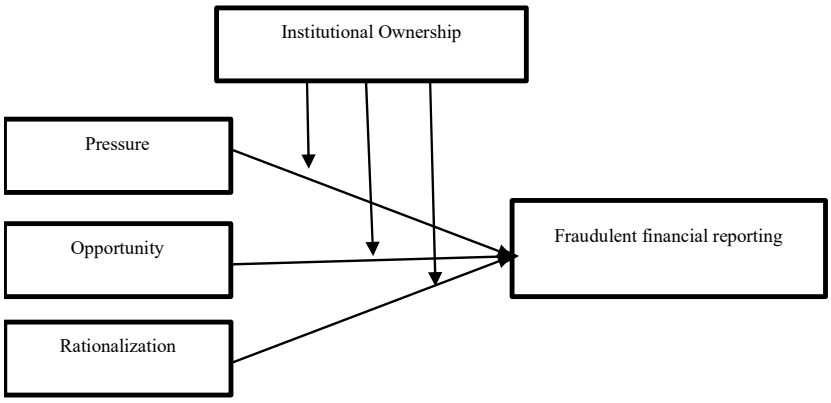
2.3. Institutional Ownership

Institutional Ownership is the percentage of shares owned by institutional investors, such as insurance companies, banks, investments and institutional or corporate ownership (Triyani et al., 2019). Institutional investors can be divided into two, namely active investors and passive investors. Active investors are investors who want to be involved and active in managerial decision-making, while passive investors do not really want to be involved in managerial decision-making.

2.4. Fraudulent financial reporting

Fraud is fraud committed by the management of a company, presenting financial reports incorrectly, which is of course detrimental to investors and related parties. Deliberate mistakes due to the financial condition of a company are made by making financial statements that are wrong either from numbers or in disclosing financial statements that aim to deceive users of financial statements (Hidayat et al., 2022).

Figure 2. Research Conseptual Framework



Source: author's data.

2.5. Research Hypothesis

2.5.1. Effect of pressure on fraudulent financial reporting

Pressure is an incentive for people to commit fraud. Financial and non-financial are the scope of pressure (Widarti, 2015). An example in terms of finance is the urge to have material goods. Whereas non-financial is what encourages someone to commit fraud to cover up poor performance (Ibrahim et al., 2022). The pressure that is proxied by personal financial need is the company's financial condition which is influenced by the financial condition of the company's executives (Skousen et al., 2009, Diansari & Wijaya, 2019). Ownership of shares of managers, directors or the board of commissioners of the company affects the company's financial condition. The results of research from Skousen et al. (2008); Sari & Nugroho, (2020); and Khamainy et al., (2022) that financial personal need influences fraudulent financial reporting.

H_1 = Personal Financial need has a positive effect on fraudulent financial reporting

2.5.2. Opportunity impact on fraudulent financial reporting

Opportunity or opportunity is an ideal state of a company in the industry (Diansari & Wijaya, 2019). According to Skousen et al. (2008) balances in certain accounts will be determined in large part according to estimates and subjective judgments. Accounts receivable and inventories require subjective assessment in estimating uncollectible accounts Summers & Sweeney (1998) and Skousen et al. (2009). The results of research from Putra (2019) and Fadli & Junaidi (2022) opportunity have an effect on fraudulent financial reporting. Based on the description, the following hypothesis is proposed:

H_2 = Nature of industry has a positive effect on fraudulent financial reporting.

2.5.3. The effect of rationalization on fraudulent financial reporting

The proxy for rationalization is a change of auditors. The auditor has an important role in overseeing the company's financial reporting where there are indications of fraud. Companies that commit fraud more often change auditors, because company management tends to minimize detection by old auditors related to fraudulent financial reporting Tiffani et al. (2009). The results of research from Sabaruddin (2022) and Taqi et al., (2021) state that rationalization has an effect on fraudulent financial reporting, this is inversely proportional to Apriliana & Agustina (2017).

H_3 = Financial rationalization has a positive effect on fraudulent financial reporting

2.5.4. Institutional ownership in moderating the influence of personal financial need (Oship) variables on fraudulent financial statements.

The lower the funding ratio of a company, the higher the potential for fraud in financial reporting, and vice versa, because in dealing with pressures that occur the company requires additional debt or external sources of financing so that the company remains competitive, including financing research expenditures or capital (Skousen et al., 2008).

H_4 = Institutional ownership is able to moderate the variable personal financial need for fraudulent financial reporting.

2.5.5. Institutional ownership in moderating the influence of the nature of industry variables on fraudulent financial statements

Institutional ownership is one indicator of measuring good corporate governance. The monitoring mechanism is carried out by institutional ownership in every decision made by the manager, besides that it reduces the occurrence of engineering in financial reports (Yahya et al., 2021). The existence of good corporate governance practices in a company is considered capable of suppressing fraudulent financial reporting. The higher the implementation of GCG, the higher the opportunity level for fraud can be reduced, which will reduce the potential for fraudulent financial statements (Samukri et al., 2022).

H_5 = Institutional ownership can reduce the volatile nature of the field in the area of fraudulent financial reporting.

2.5.6. Institutional ownership in moderating the effect of rationalization variables on fraudulent financial statements

Based on agency theory, the more concentrated ownership, the principal has incentives to monitor agents so that agents act in accordance with the interests of owners, institutional ownership inhibits managers from acting opportunistically so that shareholder expectations are achieved (Hidayat et al., 2022). Institutional ownership can reduce the rationalization of companies that cause fraudulent financial reporting. Institutional ownership can supervise management and participate in decision-making, especially regarding auditor changes

(Ibrahim et al., 2022). The higher the rationalization, the higher the probability of management to commit fraudulent financial reporting, in other words, institutional ownership can weaken the relationship between rationalization and fraudulent financial reporting.

H_6 = Institutional ownership is able to moderate the variable nature of industry on fraudulent financial reporting.

3. Research Methods

This study is a quantitative study that focuses on the financial performance of a company and measures the extent to which fraud is possible in the use of a company's financial statements. The data used are the financial reports of companies incorporated in Sri Kehati Indonesia Stock Exchange from 2017 to 2021 obtained from the official website www.idx.co.id and the official websites of 17 companies. The data used belong to the category of time series and cross-sections because they contain many units and time periods. The combination of time series and cross-section is also called the panel data method. Several methods are used to estimate model parameters using panel data in the form of pooled least squares (joint effect) and fixed effects models. The independent variables in this study are personal financial need pressure (OSHIP), industry agency opportunity (REV) and rationalization (TATA), institutional ownership as a moderating variable, and fraudulent financial reporting as a dependent variable.

3.1. Operational variable definitions

3.1.1. Dependent Variable

Fraudulent financial reports

According to the Association of Certified Fraud Examiners (2020), fraudulent financial reporting is a knowing act or omission that results in a material misstatement that harms investors or creditors. According to Ibrahim et al. (2022) to find out whether the company is doing the act of fraudulent financial statements is to use the formula Beneish Model. The Beneish Model is a fraud detection method compiled based on overall data from accounting and auditing enforcement releases (AAERs) issued by the SEC in the period 1982-1992. This model uses data that can be retrieved from financial reports company, which will then produce the M-Score. This M-score will indicate whether there is fraud in the financial statements or not. If the results of this M-score exceed the value of -2.22, then the company is categorized as committing fraud, whereas if the result is less than -2.22, then the company is classified as not committing fraudulent financial statements. According to Ibrahim et al., (2022), companies with high Beneish scores have the potential to commit fraudulent financial reporting. Likelihood of occurrence of corporate fraud. M-score calculation uses the results of each of these variables and puts them in the formula as follows:

M-Score = -4,84 + 0,92*DSRI + 0,528*GMI + 0,404*AQI + 0,892*SGI + 0,115*DEPI – 0,172*SGAI + 4,679*TATA – 0,327*LVGI

3.1.2. Independent Variable

a. Personal financial need

The financial condition of company executives according to C. J. Skousen et al., (2009) affects the company's financial condition. Shares owned by insiders explain that claim rights to company income and assets are owned by managers (Diansari & Wijaya, 2019). The level of fraudulent financial reporting occurs is influenced by the share ownership structure, so personal financial need (OSHIP) can be calculated using the formula:

$$\text{OSHIP} = \frac{\text{Shareholder by owner}}{\text{Total shareholder}}$$

b. Nature of industry

Opportunity is a condition that makes it possible for someone to commit a crime ((Novarina & Triyanto, 2022). Acts of fraud committed by the perpetrators according to their beliefs will not be detected. Opportunity is proxied by the nature of the industry where the ideal conditions for a company are in the industry. One of the characteristics of the industry in a company is the condition of receivables (Himawan & Karjono, 2019). According to Skousen et al., (2015) and Novarina & Triyanto, (2022), a company is said to be good if the company can reduce and reduce the amount of company receivables and is able to further increase the receipt of the company's cash flow. The nature of industry is calculated using the following formula:

$$\text{NI} = \frac{\text{Receivable t} - \text{Receivable t-1}}{\text{Sales t} \qquad \text{Sales t-1}}$$

c. Rationalization

Rationalization is a dishonest attitude towards an action taken by management or employees and justifies this action (Novarina, Triyanto, 2022). Rationalization makes that fraudulent actions are considered correct, if the company is committing fraud then the company will get a bigger profit. Rationalization is proxied by a change of auditors. TATA is related to rationalization where the accrual principle describes all company activities so that it becomes a management reference in decision-making (Skousen et al., 2009). According to Septriani & Desi Handayani, (2018) using the following formula:

$$\text{TATA} = \frac{\text{Working capital} - \text{Cash} - \text{Current tax payable} - \text{depreciation \& amortisation}}{\text{Total asset}}$$

4. Result and Discussion

4.1. Hypothesis Test result

The software used to estimate the regression is the Eviews program version 12. The data contains heteroscedasticity, therefore a common effect model is used with a weighted cross-section. Table 1 describes the results of hypothesis testing using Eviews software version 12.

Table 1. M-Score Dependent variable

Variable	Coefficient	Std. Error	T-statistic	Prob
C	-3.264545	0.420166	-7.816721	0.0000
OSHIP	-0,005744	0.001464	-3,923362	0.0002
REV	0,142213	0.161813	0,878872	0.3824
TATA	4,632235	0.008062	572,4672	0.0000
OI	-1.560016	1.500016	-1.039573	0.3020

Source: Result of views 12.

The results of testing the hypothesis in the table above can be explained as follows:

Hypothesis Testing (H1) The regression coefficient obtained from the influence of the Personal Financial (Oship) variable on fraudulent financial statements is 0.005744 with a statistical value of 3.923262 > 1.664 (Df=80) at a significant level = 0.05 (5%) with a value a significance of 0.0002 <0.05 which states that there is a negative and significant effect between Personal Financial (Oship) on fraudulent financial statements. The regression coefficient value of 0.005744 can be interpreted to mean that if Personal finances increase by 1, then fraudulent financial statements will decrease by 0.005744 and vice versa. If Personal Financial (Oship) decreases by 1, then fraudulent financial statements will increase by 0.005744.

Hypothesis Testing (H2), the regression coefficient obtained from the influence of the Nature of Industry (REV) variable on fraudulent financial statements is 0.142213 with a statistical value of 0.878872 < 1.664 (Df = 80) at a significant level = 0.05 (5%) with a significance value of 0.3824 > 0, 05 which states that there is no influence between Nature of Industry (REV) on fraudulent financial statements.

Hypothesis Testing (H3), the regression coefficient obtained from the influence of the Rationalization variable (TATA) on fraudulent financial statements is 4.623325 with a statistical value of 573.4771 > 1.664 (Df = 80) at a significant level = 0.05 (5%) with a significance value of 0.0000 <0.05 which states that there is a positive and significant influence between Rationalization (TATA) on fraudulent financial statements. The regression coefficient value of 4.465215 can be interpreted that if the Rationalization (TATA) increases by 1, then fraudulent financial statements will increase by 4.465215 and vice versa. If Rationalization (TATA) decreases by 1, then fraudulent financial statements will decrease by 4.465215.

Table 2. M-Score independent variable

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	-61.45667	29.05713	-2.115029	0.0375
OSHIP_OI	1.770013	4.090013	0,432329	0.6667

Source: Result of views 12.

Hypothesis Testing (H4), the regression coefficient obtained from institutional ownership in moderating the effect of the Personal Financial (Oship) variable on fraudulent financial statements is 1.770013 with a statistical value of 0.432329 <1.664 (Df=80) at a significant level = 0.05 (5%) with a significance value of 0.6667 > 0.05 which states that institutional shares are unable to moderate the influence of personal finance on fraudulent financial reporting.

Table 3. M-Score independent variable

Variable	Coefficient	Std. error	T-statistic	Prob
C	33.09766	58.19829	0.568705	0.5711
REV_OI	-2.170014	8.910013	-0.024312	0.9807

Source: Result of views 12.

Hypothesis Testing (H5), the regression coefficient obtained from institutional ownership in moderating the effect of opportunity on fraudulent financial statements is 2.170014 with a statistical value of 0.024312 <1.664 (Df=80) at a significant level = 0.05 (5%) with a significance value of 0.9807 > 0.05 which means states that institutional ownership is unable to moderate the effect of opportunity on fraudulent financial reporting.

Table 4. M-Score independent variable

Variable	Coefficient	Std. error	T-statistic	Prob
C	-1.112421	0.745262	-1.492658	0.1395
TATA_OI	-8.080015	2.020015	0.400579	0.6897

Source: Result of views 12.

Hypothesis Testing (H6), the regression coefficient obtained from institutional ownership in moderating the effect of Rationalization on fraudulent financial statements is 8.080015 with a statistical value of 0.400679 < 1.664 (Df = 80) at a significant level = 0.05 (5%) with a significance value of 0.5897 > 0.05 which means states that institutional ownership is not able to moderate the effect of rationalization on fraudulent financial reporting.

Test of the Coefficient of Determination

Testing the coefficient of determination is a test tool used to measure the extent to which the model's ability to explain variations in the dependent variable. Between zero and one is the value of the coefficient of determination. If the value of the adjusted R^2 is small, this is due to the limited ability of the independent variables to explain variations in the dependent variable. If the value of adjusted R^2 is close to one, then the independent variable will almost provide the information needed to predict the variation of the dependent variable. The following are the results of the coefficient of determination test in the following table

Table 5. Result of the coefficient of determination test

Statistics Weighted

MSE Root	5.471939	R-squared	0.998825
Var Mean dependent	41.62864	Adjusted R-squared	0.999915
Var SD. Dependent	638.9701	SE of regression	5.904506
Resid Sum squared	2545.069	F-statistic	90039.19
Stat Durbin-Watson	1.755745	Prob (F-statistic)	0.000000

Source: Result of views 12.

Based on the results of the coefficient of determination test in the table above, the value of Adjusted R-squared is 0.999915 or 99.99% of the total variation of independent variables such as Pressure, Opportunity, Rationalization and Good Corporate Governance (GCG) explaining the variation of the dependent variable in the form of report fraud finance. While the remaining 0.01% (100 – 99%) is explained by other variables or factors not explained in this study.

4.2. Discussion

There is a negative and significant influence between Personal Financial Need (OSHIP) on fraudulent financial reporting. Low ownership indicates that management tends not to commit fraudulent financial reporting. This is because there is no pressure that is heavy enough for management to commit fraud in the company's financial reporting, this is in line with the results of research from Alfina & Amrizal (2020); Tiffani et al., (2009); Widarti (2015); Khamainy et al., (2022), inversely proportional to the results of research Skousen et al., (2009) and Budiyono & Arum (2020), which states that Personal Financial Need has a positive effect on fraudulent financial reporting. The more shares owned by people in the company, the greater the possibility of fraud occurring.

There is no influence between the Nature of Industry (REV) on fraudulent financial statements. This is because inventories in the industrial sector have a long obsolescence, so managers experience difficulties in committing fraud by utilizing subjective assessments of obsolete inventories. Therefore, the ratio of changes in inventory does not affect the company's management to commit fraudulent financial statements. This is in line with research from Fadli & Junaidi (2022) and Putra (2019). Unlike the results of research from Rukmana (2018); Sihombing & Rahardjo (2014); Khamainy et al., (2022); Diansari & Wijaya (2019) found that the nature of industry (REV) has a significant effect on fraudulent financial statements.

There is a positive and significant influence between Rationalization (TATA) on fraudulent financial statements. This research is in line with research from Skousen et al. (2009); Amin (2018); Fadli & Junaidi (2022); Diansari & Wijaya (2019) Change of auditor or also known as an erasure of traces if the old auditors may have been exposed to fraud. The result of the study justifies measures (rationalization) that h can be used as an excuse for fraud. Studies show that changing auditors does not affect financial statement fraud.

Institutional ownership is unable to moderate the effect of Personal Financial Need (OSHIP) on fraudulent financial reporting. This is in line with the results of research from Ibrahim et al. (2022) and Apriliana & Agustina (2017) due to the low average managerial ownership so that it is clear between shareholders and managers, so managers are unable to carry out fraud. This is inversely proportional to the results of research from Hidayat et al. (2022) which states that institutional ownership is able to moderate the influence of personal financial need on fraudulent financial reporting. Institutional ownership is not able to moderate the effects of the nature of the industry (REV) on fraudulent financial reporting (Murtado et al., 2022).

Institutional ownership is unable to moderate the effect of the nature of the industry (REV) on fraudulent financial reporting. The mechanism of corporate governance is that institutional ownership has not been able to minimize agency problems which can cause managers to commit acts of fraudulent financial statements so that they are not the same as agency theory. No matter how many shares an institution owns, it cannot prevent managers from committing fraudulent financial reporting. According to Darmadi & Sodikin (2013), outside institutional shareholders still do not have a role in monitoring fraudulent actions committed by managers, so that this gap is exploited by managers in committing fraudulent financial reporting. In contrast to the results of research from Wulandari & Maulana (2022), institutional ownership is able to moderate the influence of the nature of industry on fraudulent financial reporting.

Institutional ownership is not able to moderate the effect of rationalization on fraudulent financial statements. The presence of institutional investors has a role limited to monitoring financial performance, but does not have a decision-making role in determining a public accounting firm. So that this will not have an impact on fraudulent financial reporting practices. This research is supported by Wulandari & Maulana (2022), this is different from the results of research from Duan et al. (2023) that institutional ownership is able to moderate the effect of rationalization on fraudulent financial reporting.

5. Conclusion

There is a negative and significant personal financial need (OSHIP) effect on fraudulent financial reporting, no effect between nature of the industry (REV), on fraudulent financial statements and there is a positive effect between Rationalization (TATA) on fraudulent financial statements. Institutional ownership is not able to moderate the influence of Personal Financial Need (OSHIP), nature of the industry (REV), and Rationalization on financial statement fraud.

Suggestion

It is hoped that for further research, the corporate governance proxy will be added with an audit committee, managerial ownership, independent commissioners, audit quality and stakeholders. Meanwhile, proxy pressure other than financial stability is for further research added financial targets, financial stability, and external pressure. For proxies opportunity added proxy ineffective monitoring.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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Iana Paliova[1]

FISCAL CONSOLIDATION AND GROWTH EFFECTS OF THE EU FUNDING DURING 2021-2027 IN CENTRAL AND EASTERN EUROPE[2]

The study examines fiscal consolidation and growth effects of the EU funding for the program period 2021-2027 in Bulgaria and other EU Member States from Central and Eastern Europe (CEE). It illustrates that gradual fiscal consolidation is implemented, but might be a challenge for some CEE countries, while the growth effects of the EU funding for 2012-2027 will depend on the level of substitution between EU and domestic funding of the EU-related projects. As a result, under the partnership agreements for 2021-2027 and the national recovery and resilience plans the CEE countries are expected to reduce gradually fiscal deficit and debt towards Maastricht criteria, and to increase their annual GDP growth above the baseline scenario between 1% and 4% of GDP, reaching cumulative growth from 9 to 24% of GDP by 2027.
Keywords: Fiscal policy; Fiscal consolidation; European integration; Government policy
JEL: H68; F15; Q57

Introduction

The EU Annual Sustainable Growth Strategy 2021 states that improving the quality of public finances will contribute to increasing potential growth (European Commission, 2020). Following the objectives of the strategy for the EU 2021-2027 program period, the European Commission (EC) initiated NextGenerationEU (NGEU), additionally to the European Structural and Investment Funds (ESIF), focusing on financial support to the MS through the Recovery and Resilience Facility (RRF) to restore economic growth and fiscal sustainability.

With the unprecedented fiscal packages adopted by the EU Member States (MS) to deal with the COVID-19 consequences their fiscal deficits and debt have additionally worsened during the pandemic crisis. The EU Multiannual Financial Framework (MFF) for 2021-2027 and the MS National Recovery and Resilience Plan (NRRP) have become an imperative tool for fiscal consolidation and recovering economic growth. The aim of the EU funding from the

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RRF has been to address the economic and social consequences of the pandemic, as well as to make public finances and economies more resilient to external shocks, which necessitates an assessment of fiscal sustainability in the medium term.

This research is devoted to the important issue for Bulgaria and other CEE MS about the role of fiscal consolidation after the pandemic crisis and the effects of EU funding for 2021-2027 for restoring economic growth and support macroeconomic stability. The study has two main purposes. First, the study examines the fiscal consolidation effects of the EU funding in the CEE countries and conducts a comparative analysis of the Bulgarian fiscal deficit and debt developments with other CEE MS during the period 2021-2025. The analysis has been conducted in the context of the EU initiative in 2023 for changes in the fiscal and macroeconomic governance framework. Second, it assesses the expected growth effects of EU funding for the EU program period 2021-2027 in the CEE countries.

1. Fiscal Consolidation and Macroeconomic Governance of the EU Member States

The EU legislation regulates budgetary discipline in the process of planning and implementing national budgets in the MS by transposing the fiscal rules into their national legislations. Thus, supranational fiscal rules become part of national ones and coordinate the implementation of the priority of fiscal sustainability and macroeconomic stability through control over public spending in the MS reform programs and convergence programs.

National fiscal policies in the Economic and Monetary Union are coordinated through the Stability and Growth Pact (SGP). The SGP and its reformed variants are fundamental EU legal documents designed to ensure that budgetary discipline is maintained in the MS to avoid excessive deficits and public debt in order to support macroeconomic stability and economic growth in the medium term. However, from the time of the introduction of the Council Regulation (EC) 1466/97[3] as a preventive arm of the SGP until the financial crisis of 2008, frequent non-compliance by MS has been reported. In order to restore fiscal discipline, a number of initiatives were undertaken at the EU level during the period 2011-2013, including the signing of the Fiscal Compact, through the adoption of a new fiscal directive and five regulations (Six-pack)[4], requiring MS to develop their national budgetary framework and legislation to ensure strict budgetary rules and discipline. In more detail, the changes establish a second generation of fiscal rules (2011) that give flexibility to respond to economic shocks, avoid clauses in severe recessions and new cyclically-adjusting fiscal indicators to contribute to saving excess revenues in strong growth as buffers for bad times.

After the COVID-19 pandemic crisis, the EC introduced the NGEU initiative focused on financial support to MS through the RRF to restore and boost growth. At the same time, the EC proposed a reform of the fiscal and macroeconomic governance framework in the EU

[3] Council Regulation (EC) 1466/97 on the strengthening of the surveillance of budgetary positions and the surveillance and coordination of economic policies (the preventive arm of the Stability and Growth Pact).

[4] Official website of the EC, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2014:905:FIN.

with an emphasis on the predictability of public spending for debt sustainability and economic growth, to address issues related to the coordination and monitoring of EU economic policy over the next decade. On 26 April 2023, the EC presented legislative proposals to implement a comprehensive reform of the fiscal rules through a proposal to amend the Council Regulation (EC) 1466/97 on the strengthening of budgetary surveillance and the coordination of economic policies.[5]

The main criticism of the current framework is that it relies on unobserved statistical variables that are sensitive to cyclical business conditions and needs to be simplified (e.g., structural fiscal balance linked to a potential gap). Structural budget estimates and budget projections are subject to large revisions, in part due to uncertain estimates of the output gap, which lead to erroneous policy recommendations (Darvas et al., 2018). Some researches consider current quantitative fiscal rules as complex, opaque and difficult to implement (Claeys et al, 2016; Darvas et al., 2018). The current framework has also been criticized for including a complex set of interpretation provisions, including various flexibility clauses, which make the implementation of the framework complex and hinder transparency. Another criticism has been that fiscal rules do not always respond to the diversity of the MS macroeconomic situations and the uncertainty of debt projections regarding the size of future extra-budgetary liabilities, economic shocks, future interest rates and future growth rates (Blanchard et al., 2021). Taking into account the objectives of fiscal sustainability and combined with compliance with fiscal rules, countercyclical fiscal policy would have an undeniable positive effect in the long term on the economic development of emerging economies in the CEE, aimed at promoting economic growth and managing macroeconomic imbalances (Bobeva, 2016; Yotsov, 2013).

The goal of the reform is to facilitate effective monitoring of fiscal indicators and economic imbalances, anchored in a common framework that guarantees equal treatment and multilateral coordination of the MS policies. The framework should ensure stability in the face of changing economic conditions and global uncertainty by introducing robust and predictable rules for derogation in exceptional circumstances. It should also follow an integrated approach where monitoring tools complement each other in the context of the European Semester. The new framework includes four main elements:

- debt sustainability analysis – classification of countries by risk level, using a transparent methodology agreed between EC and MS;
- fiscal adjustment paths – to be implemented within a maximum period of 4 years, extendable to 7 years with justified clause;
- long-term objective – to achieve a 3% fiscal deficit and 60% public debt;
- medium-term objective – sustainable deficit and debt levels to be achieved within 4 to 7 years.

The framework also will not consider investments financed by EU funds. The structural deficit will be assessed within a 4-year period and an annual adjustment of 0.5% will be

[5] European Commission COM (2023) 240 final. Proposal to amend Regulation (EC) No. 1466/97 on the strengthening of supervision over the state of the budget and the coordination of economic policies.

required for MS to reach a deficit of 3%. The corrective mechanism in case of not non-compliance will be implemented with freezing EU funds and macroeconomic conditionality. The EC will make public the debt sustainability analysis, the multi-annual adjustment path, and the corresponding level of the structural primary balance at the end of the 4-year adjustment period.

The new framework also considers the effects of the RRF support on economic activity and other EU financing which will continue to provide significant fiscal support for aggregate demand. Medium-term fiscal plans and national reform programs of the MS should take this into account. The stability and convergence programs must demonstrate how the medium-term fiscal plans of MS ensure a gradual downward path of public deficit and debt to reasonable levels and sustainable growth through gradual consolidation, investment and reforms. In this regard, the EC approved a list of additional indicators in the Convergent Programs for the period until the action of the RRF in 2026.

2. Literature Review

Research mainly defends the thesis of the short-term effect of increased government spending during the crisis and the need for fiscal consolidation afterwards. The avoidance of large fiscal deficits and public debt is to ensure macroeconomic stability and growth in the medium term. In the period of economic recovery and expansion fiscal consolidation is vital to restore and boost growth. The impact of fiscal policy varies over the business cycle with multipliers that are larger in periods of crisis than in expansions of the economy.

Studies examine two approaches to fiscal consolidation. The first approach observes whether the fiscal consolidation episode achieves ex-post outcomes in line with ex-ante targets. The second approach focuses exclusively on ex-post achievement of a minimum threshold improvement in key macro-fiscal outcomes (i.e., fiscal balance and debt ratio) and assesses whether they are achieved over a specified time or long-lasting (Balasundharam et al., 2023).

In fiscal consolidation, what is being consolidated and optimised is essential (Blanchard, Leigh, 2013). Discretionary fiscal stimulus can contribute significantly to accelerating the growth of the economy in the short term (Rzonca, Cizkowicz, 2006). Fiscal consolidations are successful in reducing the budget deficit up to two years after the consolidation, and that fiscal restraint is large when it is outside the range of the period mean plus/minus one standard deviation (Purfield, 2003). Alesina et al. (1998) study the effects of fiscal consolidation and point out that not only fiscal adjustments but also their composition matters. Fiscal announcements and credibility reduce uncertainty surrounding public debt (Caldas-Montes et al., 2019).

High-income OECD countries are more likely to succeed in their consolidation efforts relative to emerging markets, because higher income is often associated with stronger institutions and thus a greater capacity to design and implement fiscal reforms (Adam, Bevan, 2003; Heylen, Everaert, 2000). Studies provide evidence that governments with a parliamentary majority and facing no imminent elections are more likely to succeed in fiscal consolidations (Baldacci et al., 2004); Clements et al., 2022). Institutional characteristics also

affect the size of multipliers. They are different for existing and new policies, due to the difficulty of structural reforms and the different effectiveness of institutions in implementing them (Dobreva, 2017).

Alesina et al. (1998) indicate that the 1.5% reduction in the primary budget deficit as a tightening of fiscal policy, noting that such policy can either succeed or fail. According to their research, such a policy is successful if one of the following two conditions is met: the primary deficit is reduced by 2 percentage points (p.p.), or the debt-to-GDP ratio is 5 p.p. lower three years after the fiscal tightening year. Alesina and Perotti (1997) note that successful fiscal consolidation is associated with a reduction in the rate of public sector wage growth, current expenditures, and subsidies, while unsuccessful fiscal consolidation is associated with a reduction in investment spending. Successful consolidation implies no increase in taxes on employee compensation (wages and social security). Alesina and Ardagna (2009) studying a set of fiscal consolidations conclude that a clear income policy is the basis of successful fiscal consolidation. Some studies argue that fiscal consolidation can be an anti-cyclical tool in the stabilization policy of the state, the need to form a fiscal reserve to be formed in a period of economic revival and to finance aggregate demand during a crisis, avoiding growing budget deficits and public debt (Manliev, 2012).

A study on Bulgaria's fiscal measures to increase demand during crisis defends that the basis of the macroeconomic policy after the crisis should be fiscal and monetary measures together to participate in the counter-cyclical strategy for overcoming the economic consequences of COVID-19 (Tsvetkov, Georgieva, 2021). Another research for Bulgaria, Lithuania and Estonia assesses the revenue and expenditure's fiscal multipliers (Georgieva, 2021). Estimates show that fiscal multipliers are typically small in small economies and spending multipliers are larger and therefore more effective than tax multipliers. The authors argued that for Bulgaria and Lithuania, the increase in government consumption would have a relatively strong effect on GDP.

Logos (2001) argues that the effects of the EU funding on economic activity are not only on demand in the short term, but also on supply in the long term, resulting in economic growth and investment. The effects are created at the time of the improvement of the productivity of the economy, but are revealed at a later stage, after the completion of the programs with the EU funding. They have a long-term aspect and their influence is provoked by improving the productivity of a number of sectors through investments in physical and human capital. On the other hand, in the absorption of EU funding during an economic boom, increased demand may lead to economic activity exceeding potential economic growth and thus to overheating of the economy.

According to Cappelen et al. (2003), EU funding helps increase economic growth and equalize productivity and incomes in the EU MS, but poorer regions are hampered by their unfavourable industrial structure, the dominant role of agriculture as the main sector, and by the lack of funds directed to research and development. Checherita et al. (2009) emphasize that while the EU net transfers contribute to reducing household income disparities at the regional level, they also hinder economic development.

The social costs of the inefficiency in the management of the EU funding and the problems in the process of their absorption for the government administration and the beneficiaries

further reduce their impact on the convergence process (Nozharov, 2016; Kaneva, 2015). According to other studies, both EU funds and foreign investments contribute to economic development and growth (Christova-Balkanska, 2016). Some studies put into discussion many fundamental problems of European integration and cohesion, including the concept of convergence and the ultimate goal of this process (Rangelova et al., 2021). Under the pressure of international competition, there have been new challenges to the role of the EU in the global economy in recent decades, as evidenced by changes in the structure of EU foreign trade relations with third countries (Panusheff, 2016).

3. Data and Evaluation Methodology

The study uses the EC data for expenditures from the EU funding (ESIF and NGEU), national contribution to the EU budget, and GNI till 2022 for each CEE country.[6] To assess the impact on the fiscal position of European funding we use the following equation:

FB adj = Rev (EU funding) – National Co-financing – Contribution to EU budget

where:

Rev (EU funding) is Revenues from the EU funding (% of GDP), of which funds from NextGenerationEU (NGEU)

National Co-financing – National resources allocated to the EU projects

Contribution to EU budget – Annual MS payments from the national budgets to the EU budget (% of GDP)

FB adj – Adjustment of the fiscal balance (FB) as % of GDP (improvement (+)/deterioration (-)

We use the reported data for 2021 and 2022 to assess the fiscal consolidation effect for the whole of 2021-2027, assuming that the absorption rate of the ESIF and NGEU during the remaining period of 2023-2027 will be the average absorption rate for 2021 and 2022, and the final year for absorption of the NGEU resources will be 2026.

Contribution to the EU budget is calculated using the EC data about GNI of the CEE MS and VAT contributions and adjustments for the previous period and the new contribution on plastic packaging waste not recycling. The structure of the EU funding and contributions to the EU budget for the previous period determines the dynamics of contributions and absorption. The EU funding to MS is usually lower at the beginning of the program period and increases gradually as it progresses. However, the projects for the previous program period finish at the beginning of the new one, which is also taken into account in our assessment. National co-financing is assumed to be 20% of the total budget for EU projects.

Our estimates on the generation of the additional GDP in Bulgaria and other CEE MS above the baseline scenario are based on the modified methodology of Rosenberg and Sierhej

[6] Official site of the EC, https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2021-2027/spending-and-revenue_en.

(2007) for a "crowding out" effect of European financing and “augmenting” effect of domestic spending on aggregated demand. The methodology uses the formula: D = α (T + NC) - C, where: D: impact on aggregate demand of EU funding (ESIF and under NGEU); α: substitution between European and domestic funding; T: transfers from ESIF and NGEU, NC: national co-financing; C: Contribution to the EU budget.

The “crowding out” factor of EU funding for the CEE countries, denoted by α, depends on the different degrees of substitution of the EU funding with national domestic funding and varies between 0.55 (with a "crowding-out" effect of 45%) and 0.65 (with a "crowding out" effect of 35%). Implementing the principle of "additionality" through national funds, its contribution to aggregate demand can reach 100%, and then the coefficient α will be 1, which implies a maximum impact on aggregate demand.

For our assessment, we used the data published by the EC for the EU resources provided under the partnership agreements from the ESIF and the NRRP from the RRF for each CEE MS. The estimates were made separately for each of them with the above-described coefficients. The estimates use the utilization rate of the EU absorption rates as a share in GNI under the ESIF for the previous program periods, as well as ESIF and NGEU reported by the EC for the first two years of the 2021-2027 period. Then, the average absorption rate is used for the remaining budgeted resources for the 2023-2027 period in the partnership agreements and NRRF.

4. Results Analysis

The ESIF reform for the 2014-2020 programming period aimed to maximize the ESIF's contribution to sustainable, smart and inclusive growth in the EU through the Europe 2020 strategy. The EU Sustainable Growth Strategy from 2021 has been a continuation of those efforts and for restoring growth after the COVID-19 pandemic crisis. The experience gained during the previous programming periods by the CEE countries has been considered a prerequisite for the successful planning and implementation of EU programs for the EU 2021-2027 program period.

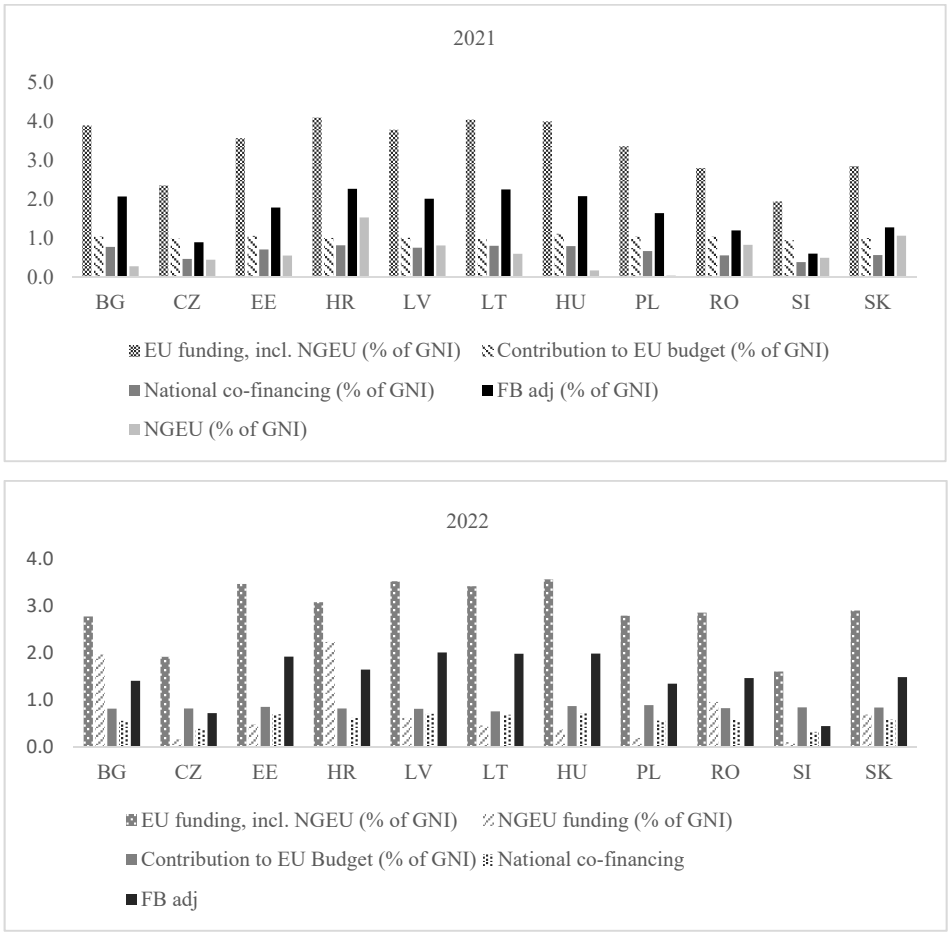
4.1 Fiscal consolidation effects of EU funding during 2021-2027 in the CEE Member States

During the years of EU membership, Bulgaria, together with other CEE MS, has been a net recipient of EU funding and benefited from the changes to a decentralized system of management and control of the ESIF. The reform aimed to achieve a strategic shift towards a more operational, less bureaucratic and better-targeted approach to managing the EU funds in relation to the economic and social challenges that the EU is facing as a result of the expansion and deepening of integration (Houbenova-Delisivkova, 2007, 2017).

As can be seen from our estimates presented in the below figure, in the CEE MS EU funding with the new NGEU financial instruments contributes to fiscal revenues between 0.7% and 4.1% of GNI for 2021 and 2022. It is due to the different levels of absorption of EU resources budgeted for the CEE MS. The best absorption of the EU funding is reported by the Baltic

countries, Croatia, Bulgaria and Hungary, where the reported share of the EU funding by the EC is around 4% of GDP for 2021.[7] The increased EU funding is mainly due to the final payments of the EU-related projects for the 2014-2020 program period. In 2022, these countries, apart from Bulgaria, continue to absorb significant EU resources, including from NGEU, which have had a positive effect on their fiscal consolidation process.

Figure 1. CEE countries: Absorption of EU funding and annual national contributions to the EU for 2021 and 2022



Source: Own calculations, European Commission's data for 2021-2022.

[7] Official site of European Commission, https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2021-2027/spending-and-revenue_en.

Assuming that the absorption rate of the ESIF and NGEU during the remaining period 2023 - 2027 will be around the average absorption rate for 2021 and 2022, and the final year for absorption of the NGEU resources is 2026, our assessment for the fiscal balance adjustment is between 0.6% of GNI for Slovenia, around 1% of GNI for Czechia, Romania and Slovakia, and around 2% of GNI for Bulgaria, Croatia, Baltic countries, Hungary and Poland. At the same time, the national contribution to the EU budget of all MS is kept at about 1% of the GNI, of which the new contribution on plastic packaging waste not recycling constitutes to 0.04-0.05% of GNI.

Table 1. Average EU funding-GDP ratio for the period 2021-2027

	BG	CZ	EE	HR	LV	LT	HU	PL	RO	SI	SK
(1) EU funding, incl. NGEU (% of GNI)	3.4	2.2	3.6	3.6	3.7	3.7	3.8	3.1	2.9	1.8	2.9
(1.1) NGEU (% of GNI)	1.2	0.4	0.6	1.9	0.7	0.6	0.3	0.1	0.9	0.3	0.9
(2) Contribution to EU budget (% of GNI)	0.9	0.9	1.0	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9
(3) National co-financing (% of GNI)	0.7	0.5	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.4	0.6
(4) FB adj (% of GNI) = 1-2-3	1.8	0.8	1.9	2.0	2.0	2.2	2.1	1.5	1.4	0.5	1.4

Source: Own calculations, European Commission's data for 2021-2022

4.2 Fiscal deficit in the CEE Member States during 2021-2025

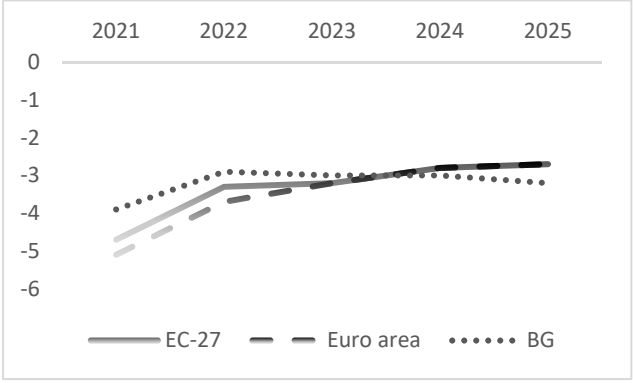
After the COVID-19 pandemic crisis and the new reality of the war in Ukraine fiscal consolidation in Bulgaria and other CEE MS has been implemented at a slower pace than after the 2008 global economic and financial crisis. All CEE MS introduced temporary fiscal support to businesses and households during the pandemic and energy crisis, worsening their fiscal stance. In our view, directing government support to those who need it most, including for offsetting high energy prices, helped to limit fiscal costs. A study by Anil et al. (2022) argues that compensating the bottom 20% of households in EU MS for the energy price spike in 2021-2022 is estimated to cost of 0.4% of GDP on average, although with significant differences between EU MS. The study's conclusion is that providing as a lump sum half of the compensation for the bottom quintile to the next two quintiles, covering the 20^{th} to 60^{th} percentiles of the consumption distribution, would double the average cost to 0.8% of GDP.

All EU MS are moving to a new stage of development of their economies after COVID-19, the new global reality, and the new fiscal instruments under the EU MFF for 2021-2027. In 2021-2022, economic activity was noticeably recovering, despite the war in Ukraine and EU economic sanctions against Russia, which initially worsened the outlook for 2023.

Bulgaria's fiscal deficit widened to 3.7% for 2020 (from a 2.1% surplus in 2019), exceeding the target of 3% of GDP mainly due to the above-discussed temporary measures related to the prevention of the spread of COVID-19 in the country. The deficit increased to 3.9% in

2021. After that, it was improved in 2022, reaching 2.9% of GDP.[8] The total (net) budgetary cost of energy-related measures is estimated to be 0.8% of GDP for 2023. The fiscal deficit is expected to stay at 3% of GDP in 2024 to boost growth, which could however have negative effects in the medium term.[9]

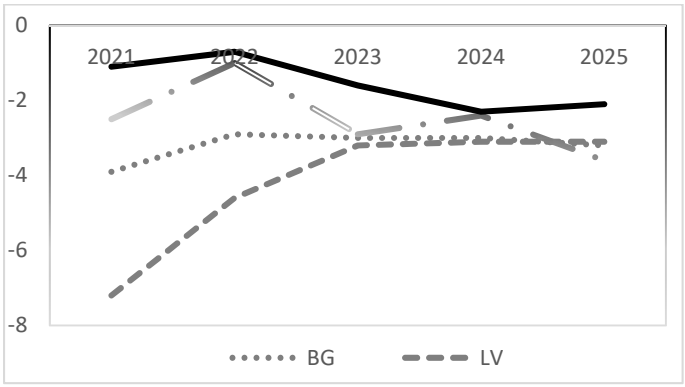
Figure 2. Fiscal deficit of Bulgaria and EU-27 for 2021-2025 (% of GDP)



Source: Eurostat, Fiscal Notification (Autumn 2023), EC Forecast (Autumn 2023).

Baltic countries have similar developments and their fiscal stance is adjacent to Bulgaria, but in terms of their policies after the pandemic crisis and high energy prices, all of them have specifics that have an impact not only on growth, but also on the fiscal deficit.

Figure 3. Fiscal deficit of Bulgaria compared to Baltic countries, 2021-2025 (% of GDP)



Source: Eurostat, Fiscal Notification (Autumn 2023), EC Forecast (Autumn 2023).

[8] Eurostat. (2023). Provision of deficit and debt data for 2022 – second notification. Press release 118/2023 – 23 October 2023.

[9] EC Automn forecast, https://economy-finance.ec.europa.eu/economic-surveillance-eu-economies/bulgaria/economic-forecast-bulgaria_en.

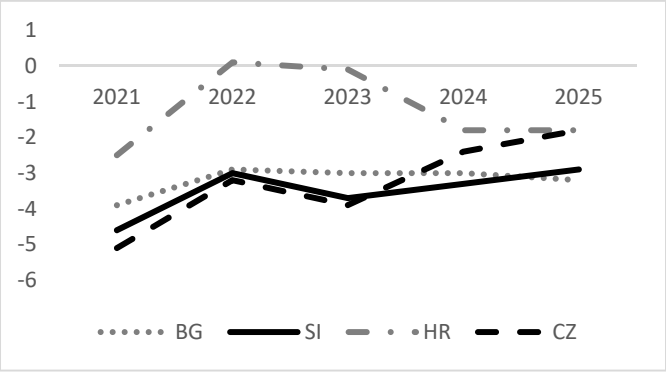
The fiscal deficit of **Estonia** was 2.5% of GDP in 2021 well below the reference level of 3% of GDP, then further consolidation was implemented in 2022 reaching an improvement of 1.5 p.p. However, the latest forecast predicts the fiscal deficit of Estonia to rise to 3.6% in 2025 due to the policy of government to cut personal income taxation and the economic growth which cannot overcome it.

Lithuania is performing with the best fiscal stance among the CEE MS and the country is projected to keep its fiscal deficit quite below the reference level of 3% of GDP during the 2021-2025 period. Similar to Bulgaria, the fiscal deficit is mostly due to an increase in expenditure on social benefits, intermediate consumption, public wages, and public investment more than the increase in tax and social security contributions revenues. Deficit developments in 2024 are expected to be positively affected by the phasing out of the temporary fiscal measures aimed at mitigating high energy prices. The net budgetary cost of these measures is projected at 0.4% of GDP in 2023 and 0.1% of GDP in 2024.

Latvia also plans to continue implementing fiscal consolidation measures, improving tax collection and reducing its deficit to 4.6% of GDP in 2022 and 3.1% of GDP in 2025. The impact of the phasing-out of energy-related measures by the end-2023, however, will be then offset by additional expenditure measures foreseen for 2024. The revenue will increase by the introduction of corporate income tax advance payments from the financial sector, an increase in the rates for a number of excise products and additional dividend payments from SOE are expected to yield a moderate increase in revenue. However, public wage increases (teachers, sectoral ministries and institutions), additional financing to healthcare and education, supplementary payments to pensioners and targeted support for the sharp increase in mortgage interest rates, development of technical infrastructure of the external border will worsen the fiscal stance.

While the fiscal deficit of Bulgaria has been forecasted to be around the reference level of 3% of GDP for the period 2023-2025, **Slovenia, Croatia and Czechia** are more ambitious in their efforts for fiscal consolidation by 2025.

Figure 4. Fiscal deficit of Bulgaria compared to Slovenia, Croatia and Czechia, 2021-2025 (% of GDP)



Source: Eurostat, Fiscal Notification (Autumn 2023), EC Forecast (Autumn 2023).

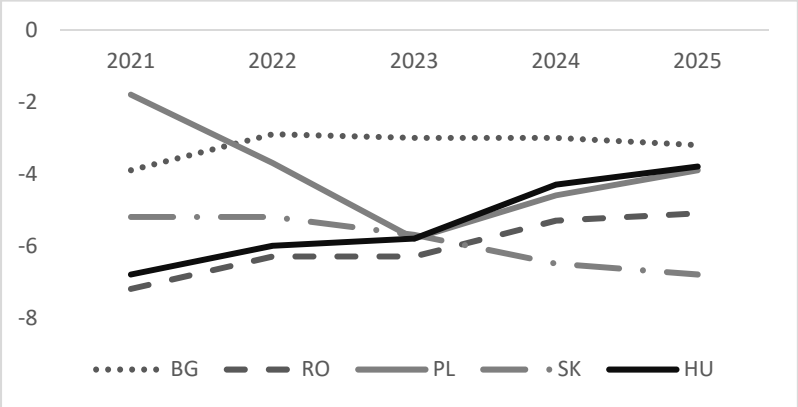
Slovenia's fiscal deficit is projected to peak in 2023 – due to weaker growth and one-off expenditure for reconstruction after the summer floods, and then decrease to 2.9% in 2025. Gross fixed capital formation is set to reach 6% of GDP in 2023 as the final absorption year of the MFF 2014-2020. Revenues from taxes on production are expected to remain weak due to lower GDP growth in 2023. Measures to mitigate the economic and social impact of high energy prices and expenditure for reconstruction after floods, estimated at 0.9% of GDP, will increase the deficit to 3.7% of GDP in 2023 and then improve to 1.8 of GDP in the 2024-2025 period.

Croatia has been undertaking strong fiscal consolidation measures after the pandemic, supported by continued strong economic activity and high inflation, and achieved a surplus of 0.1% of GDP in 2022. However, they are expected to be more than offset by high increases in wages and social benefits and then the deficit to increase slightly to 1.8% in the 2024-2025 period, still quite below the reference level of 3% of GDP.

In **Czechia** the budget deficit is set to rise in 2023 driven by expenditures, increasing faster than GDP. It is a result of the automatic indexation of pensions to inflation, and measures to mitigate the impact of high energy prices, which net budgetary cost is estimated at 1.2% of GDP in 2023. Public investment is also expected to peak in 2023 due to the completion of projects financed by EU funds in the programming period 2014-2020. Afterwards, the country plans to take consolidation measures and reduce the deficit to 1.8% of GDP in 2025.

Romania, Poland and Slovakia increased substantially their one-off business and household supported measures during the pandemic and the 2022 energy crisis, performing with the highest deficit among the CEE MS. As seen on the graph Hungary, Poland and Romania have undertaken financial consolidation measures to move towards the EU reference level of 3% of GDP, while Slovakia will continue to worsen its fiscal deficit to 6.8% in 2025.

Figure 5. Fiscal deficit of Bulgaria compared to Romania, Poland and Slovakia, 2021-2025 (% of GDP)



Source: Eurostat, Fiscal Notification (Autumn 2023), EC Forecast (Autumn 2023).

Romania's general government deficit is among the highest in the CEE MS around 6% during the period 2022-2025. The government spending on personnel and goods and services and slower revenue growth due to weaker economic activity. Public investment as a share of GDP is expected to rise significantly, reflecting ambitious targets for both nationally and EU-funded investment projects. The cost of measures to mitigate the impact of high energy prices is estimated at 0.3% of GDP in 2023. A fiscal consolidation package amounting to about 1.2% of GDP includes spending cuts, generated through measures to streamline public administration and tighter eligibility conditions for public servants to benefit from holiday vouchers and food allowances, and new measures in revenues amounting to 0.9% of GDP.

In **Poland** the fiscal deficit in 2023 is estimated to increase to 5.8% of GDP due to the expenditure on defence, higher salaries in the public sector, health care and extraordinary subsidies to farmers, and high indexation of pensions. In the period 2024-2025, the expectations are for most energy-related measures (to 0.4% of GDP) to be phased out and the revenue to pick up as a result of economic recovery, which will reduce the deficit to 3.9% of GDP. As in Bulgaria the high deficits in the EU terms also relate to timing of payment and deliveries of military investments.

In **Slovakia,** the substantial increase in fiscal deficit to 6.8% of GDP in 2025 is a consequence of the newly approved social expenditure measures, such as the increase in pensioner's care allowance, changes in the assessment of disability pensions and an allowance for people working in social services.

Hungary's budget deficit is driven mostly by higher spending on interest and pensions due to high-interest rates and inflation, as well as energy measures. On the other hand, due to the expected cuts in capital expenditure, and the postponed recapitalisation of the central bank the deficit is expected to be reduced from 6.8% in 2021 to 3.8% in 2025.

4.3 Public Debt Developments of the CEE Member States

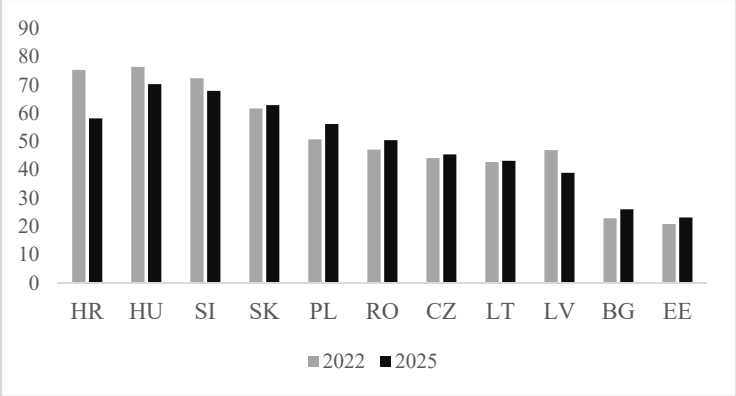
The nominal growth and phasing out of one-off fiscal measures to cope with the pandemic and high energy prices are expected to decrease the debt-to-GDP ratio in CEE countries, which are higher than the reference level of 60% in 2022, such as Croatia, Hungary and Slovenia. This decrease is expected to be supported by strong GDP growth. Poland's high deficits related to the timing of payment and deliveries of military investments led to a slight increase in the debt-to-GDP ratio in 2025. Slovakia's high fiscal deficit projected for 2025 will also increase by 1 p.p. the public debt, staying at 63% of GDP. Public debt of other CEE MS, including Bulgaria, is expected to increase slightly by 2025, but will be well below the reference level.

Estonia and Bulgaria are the CEE countries with the lowest government debt projections for the period 2022-2025. Bulgaria's consolidated government debt-to-GDP ratio for 2022 amounted to 22.9%, but the projections are to increase to 26-27% in 2025 due to the persistent fiscal deficits for the period 2023-2025.[10] Although Bulgaria's government debt remains low

[10] See also Economic Research Institute of the Bulgarian Academy of Sciences. Annual report for 2023. Economic development and policies in Bulgaria: Assessments and expectations.

compared to other EU MS, consistent fiscal consolidation is needed to avoid passing the debt burden to future generations amid adverse demographic trends in the country.

Figure 6. Public debt to GDP ratio in the CEE MS, 2022 and 2025

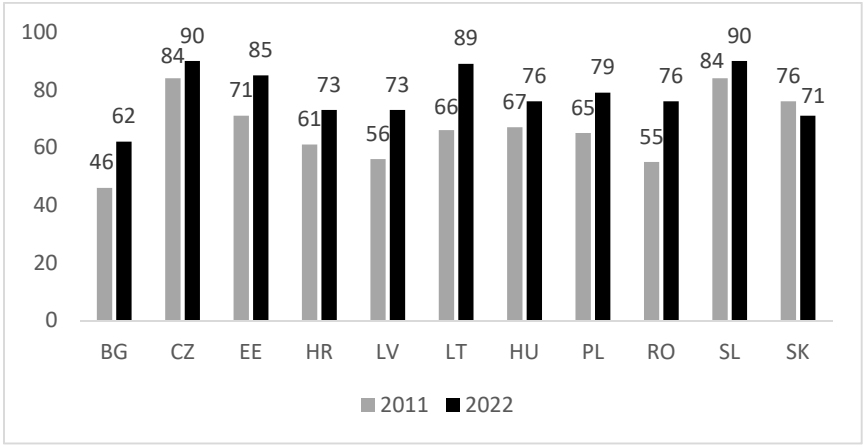


Source: Eurostat, Fiscal Notification (Autumn 2023), EC Forecast (Autumn 2023).

4.4. Growth effects of EU funding for 2021-2027

Until 2022, EU funds have contributed significantly to bringing CEE MS to the EU average GDP per capita (in PPPs). For the last decade, some CEE MS increased their GDP per capita by more than 14 p.p. Slovenia and Czechia are approaching the EU average GDP per capita (in PPPs). On the other hand, Bulgaria with an increase of 16 p.p. is among the countries which increased their GDP per capita more in the last decade (Lithuania – 23 p.p., Romania – 21 p.p., Estonia – 14 p.p.).

Figure 7. CEE Member States: GFP per capita (in PPPs) of the EU average

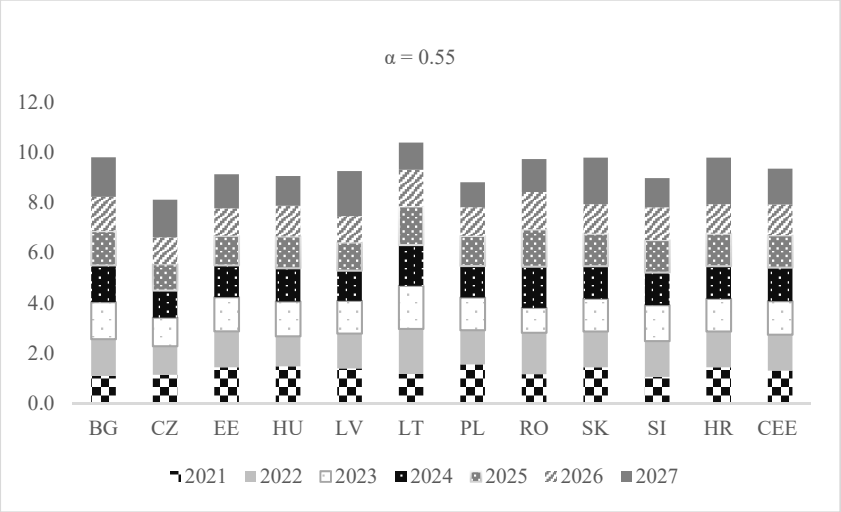


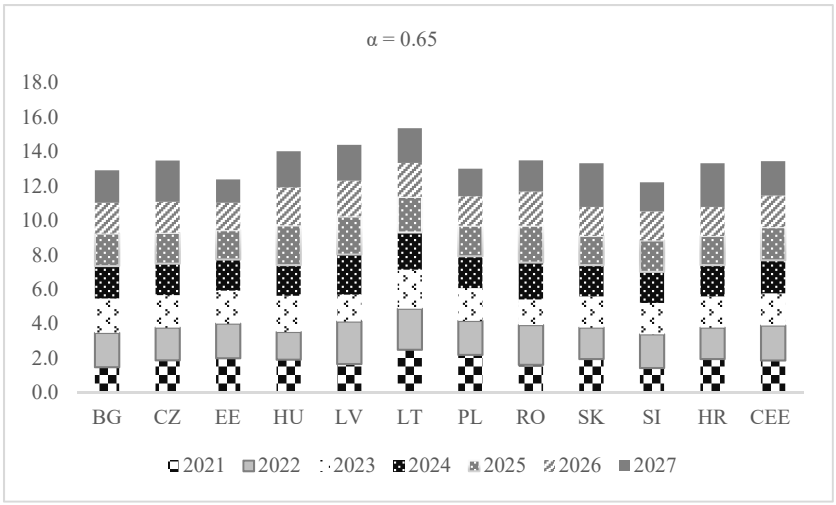
Source: Eurostat.

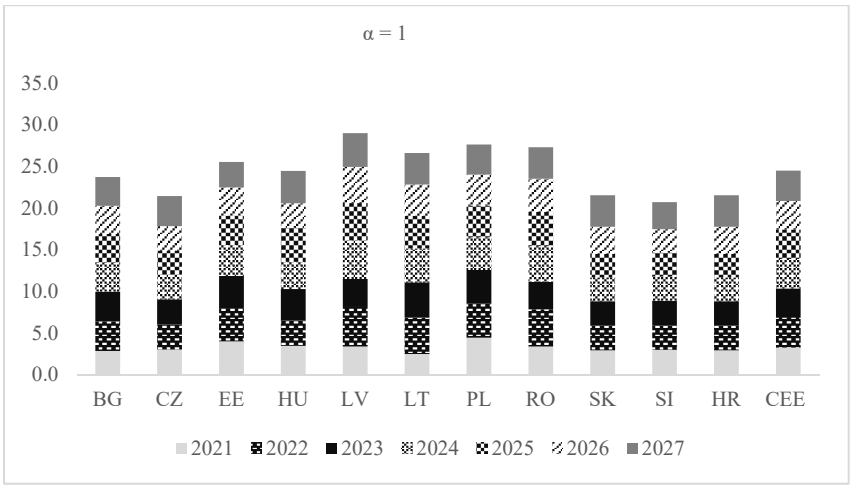
Our assessment for each CEE country is based on the budgeted ESIF under the partnership agreements and NRRP for 2021-2027 and specifics of the CEE MS. The assessment took into account that in the period 2022-2023 the impact is higher due to the final payments for the 2014-2020 program period. When calibrating the data, using the described methodology for the 2021-2027 program period, our estimates with the three "crowding-out " coefficients α=0.55, α=0.65, and α=1 for additional GDP growth above the baseline scenario showed 1% to 4% per year. The growth effects are almost equal during the period 2021-2027, using different substitution coefficients, while for the first two program periods of EU membership, it was between 0.5% and 0.7% in the first years, and 1.5% - 3% in the last years of the period (Paliova 2022). Allard et al. (2008) assessed the impact of the EU funds for the CEE in one group, with respect to EU-15 as donor countries, using the Global Integrated Monetary and Fiscal Model (GIMF) of the International Monetary Fund. Their simulations showed around 3% of GDP's higher annual growth from the baseline scenario. Varga and Veld (2010) used the EC's QUEST III model, assessing the cumulative effects of cohesion policy on GDP compared to the non-cohesion baseline for program spending over the program periods, and their estimates showed annual growth of 2%-4% and cumulative GDP effects of 44.9% above the baseline scenario for CEE MS by 2025. Gáková et al (2009) used the HERMIN model for 12 MS and concluded that with full absorption of the originally planned EU funds it is expected between 2.3% and 3.9% additional annual GDP growth above the baseline scenario.

The estimates showed a cumulative GDP average growth for the CEE of 10% (α=0.55), 14% (α=0.65), and 24% (α=1). Our estimates are close to the ones we estimated for the previous program periods 2007-2013 and 2024-2020 (Paliova, 2022; Paliova, Houbenova-Delisivkova, 2022). The main difference is the impact of EU funding on aggregate GDP demand at the beginning of the period 2021-2027.

Figure 8. Commutative growth effects of European financing by countries of CEE for the period 2021-2027 (% above baseline)







Note: The graph represents the average additional growth from EU funding for the three "crowding-out" coefficients α=0.55 and α=0.65, α=1.
Source: Own estimates, European Commission, Eurostat (2022).

For **Bulgaria,** the EU funding under the NRRP and the Partnership Agreement for 2021-2027 adds €16.7 billion (24.6% of GNI for 2022) to the public resources during 2021-2027. The EU funding is divided between the programs financed by the ESIF (€10.9 bn) under the MFF for 2021-2027 and the RRF under the NGEU initiative (€5.7 bn).[11] In 2022 Bulgaria received the first tranche of EUR 1.3 billion from the RRM later than other CEE MS due to the latest approval of its NRRP. In 2023 Bulgaria submitted a payment request for the second

[11] In 2023 the resources have been decreased from the initial amount of 6.3 billion (RRF funding) approved by the EC in the NRRP (version April 2022) due to better performance of GDP growth.

tranche of €724 million. Bulgaria took a number of measures to improve the administrative capacity of the managing authorities and beneficiaries, to facilitate and speed up the procedures, to carry out prior control over the participation documentation for all EU-funded projects and harmonize the public procurement forms, as well as adopted a Law on the EU Funds Management. Despite project delays, at the end of the 2014-2020 EU program period and the initial stage of implementation of investment projects for the new 2021-2027 period also had an impact on the growing revenues from the EU grants. On the other hand, non-implementation of some EU projects of the 2014-2020 period within the specified period by the end of 2023 becomes a fiscal risk for the next budgets as the national resources for their finalization will be needed.

The assessment of the Bulgarian government through the SIBILA model is for the cumulative impact of the EU funding on GDP over the baseline scenario for the period 2014 -2020 of 9.6% of GDP by the end of 2021, and of 8.7% by 2025 (Ministry of Finance, 2023). Taking into account improvements in the capacity of absorption of public administration involved in the EU-related projects and their beneficiaries, as well as the substantial EU funding as a share in GNI, our assessment of the impact of the EU funding on the growth of Bulgaria during 2021-2027, depending on the crowding-out coefficients is for additional growth of 1.1%-3.5% and cumulative growth from 9.8% to 23.7% by end-2027.

Czechia introduced a national cost-benefit analysis model and risk control system to speed up the implementation of major infrastructure projects and managed to triple funding in one year. Czechia's EU funding for cohesion and public investments worth €29.8 billion (12.5% of GNI for 2022) for the period 2021-2027, of which €21.4 billion under the partnership agreement 2021-2027. The NRRP has been amended in 2023, increasing to €8.4 bn grants from the NGEU. The country will not use loans from the RRF. Our assessment for the impact on the growth of Czechia during 2021-2027 is for additional annual growth above the baseline scenario of 1.1% – 3.6%, and cumulative growth effect from 8.1% to 21.4%.

Estonia introduced a procedurally simplified and fast enforcement system. Estonia's EU budget totals €4.6 billion (14.6% of GNI for 2022), of which €3.5 billion under the partnership agreement and €1.1 billion grants from the RRF. The country will not use loans under the RRF. Our assessment of the impact on the growth of Estonia during 2021-2027 is for 1.1% – 3.6% for additional annual growth above the baseline scenario and cumulative growth effect from 9.1% to 25.5%.

Hungary's investment strategy with EU funding worth €27.8 billion (18% of GNI for 2022) for the period 2021-2027, of which €22 billion under the partnership agreement and €5.8 bn grants from the NGEU. The country will not use loans under the RRF. Hungary improved its absorption concentrating its efforts on the implementation of the New Development Plan and the redistribution between the various programs. The plan refers to the creation of less stringent eligibility criteria, by increasing support and grant amounts from the state budget and reducing growth expectations for the period after the implementation of the programs. The deadline for payment has been reduced from 60 to 15 days. The estimate for the impact on growth during 2021-2027 is for additional annual growth above the baseline scenario of 1.2% – 4.1%, and cumulative growth effect from 9.1 to 24.5%.

The total EU funding for **Latvia** for the period 2021-2027 amounts to €6.4 billion (19.5% of GNI for 2022), of which €1.8 billion grants from the NGEU. The country will not use loans from the RRF. Latvia has increased the efficiency of institutions by promoting a client-oriented approach and reducing administrative and financial burdens on beneficiaries, facilitating application procedures through legislative changes. Our assessment of the impact on the growth of Latvia during 2021-2027 is 1.1% – 3.8% for additional annual growth above the baseline scenario.

Lithuania's EU funding for 2021-2027 amounts to €10.3 billion (18.5% of GNI for 2022), of which €3.9 billion under the amended NRRP in 2023, of which €1.6 billion loans. The EC disbursed the first payment of €542 million. Lithuania achieved the best EU absorption and is the best performer among CEE countries in its work with the European Regional Development Fund. Our assessment of the impact on growth of Lithuania during 2021-2027, depending on the crowding-out coefficients is for additional growth above the baseline scenario of 1.1% - 4.4%, and cumulative growth effect from 10.4 to 26.6%.

Poland is with EU funding of €100.4 billion (17.5% of GNI for 2022) among the CEE MS for the period 2021-2027, of which €76.5 billion is for cohesion policies under the partnership agreement. The country relies on €23.9 billion from the RRF, of which €11.5 billion loans. In the previous program periods, Poland contracted major infrastructure projects in a timely manner, but there have been delays in payments following the pace of implementation of various projects. To speed up the procedures of the Ministry of Regional Development, the management of EU funds and the coordination of activities has been assigned to the relevant ministers, municipalities and socio-economic partners. Our assessment for the impact on growth during 2021-2027 is for additional annual growth above the baseline scenario of 1.2% – 4.4%, and cumulative growth effect from 8.8% to 27.6%.

Romania's EU funding for 2021-2027 amounts to €60.7 billion (25.3% of GNI for 2022), of which €31.5 billion under the partnership agreement and €29.2 billion from the RRF. The NRRP has been approved by the EC in 2021 as an important step towards the EU disbursement of €14.2 billion in grants and €15 billion in loans. Romania already received two tranches €1.8 billion grants and €0.8 bn loans in 2022, and a payment request for €3.22 billion has already been provided. Our estimate for the impact on the growth of Romania during 2021-2027 is for additional growth above the baseline scenario of 1%- 4%, and a cumulative growth effect from 9.7% to 27.3%.

Slovenia has established strong coordination and quality interagency institutions that organize meetings with potential candidates and advise smaller companies. Slovenia's cohesion investment policy worth €5.1 billion (9.7% of GNI for 2022) for the period 2021-2027. The NRRP will rely on €1.8 bn from the RRF, of which €0.7 billion loans. Slovenia relies less than other CEE countries on EU funding as a share in GNI for boosting growth, and our assessment is for 1% – 3.3% additional annual growth above the baseline scenario, and a cumulative growth effect from 9% to 20.7%.

Slovakia relies on €19.2 billion (19.8% of GNI for 2022) for the 2021-2027 period, of which €6.4 billion grants from the NDEU. The country will not use loans under the RRF. During the previous program, the authorities have taken additional measures to improve administrative capacity and to stimulate EU-related projects, which can help the country not

only to implement gradual fiscal consolidation, but also to stimulate growth. Our assessment of the impact on annual growth during 2021-2027 is for 1.2% – 3.8%, and cumulative growth effect from 9.8% to 21.5%.

Croatia joined the EU in 2013, and similar to other CEE MS showed difficulties in the implementation of the EU projects during its first EU program period 2014-2020 with a low absorption rate of 65%. Gaining experience with the EU projects, for the 2021-2027 period the country relies on €15.3 billion (26.7% of GNI), of which €6.3 bn grants from the RRF. Our assessment of the impact on growth during 2021-2027 is for 1.2% – 3.8% additional annual growth above the baseline scenario, depending on the substitution coefficient. The country is not included in the early assessments of the CEE MS due to its later EU accession. A study by Lejour et al. (2009) suggests that from the EU accession GDP of Croatia could rise by an additional 8% in a program period. The EC estimates that Croatia's NRRP could help to raise the national economy by 1.5% in 2021, an additional 2.5% in each of the next four years, and by 2.9% in 2026.[12]

Table 2. Effects of EU funding on aggregate demand, 2021-2027

α=0.55	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI	HR	CEE
2021	1.1	1.1	1.4	1.5	1.4	1.2	1.5	1.2	1.4	1.0	1.4	1.3
2022	1.5	1.1	1.4	1.2	1.4	1.8	1.4	1.7	1.4	1.4	1.4	1.4
2023	1.5	1.1	1.4	1.4	1.3	1.7	1.3	1.0	1.3	1.4	1.3	1.3
2024	1.5	1.1	1.3	1.3	1.2	1.6	1.3	1.7	1.3	1.3	1.3	1.3
2025	1.4	1.1	1.2	1.3	1.1	1.5	1.2	1.5	1.3	1.3	1.3	1.3
2026	1.4	1.1	1.1	1.2	1.0	1.5	1.1	1.5	1.2	1.3	1.2	1.2
2027	1.6	1.5	1.4	1.2	1.8	1.1	1.0	1.3	1.9	1.2	1.9	1.4

α=0.65	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI	HR	CEE
2021	1.5	1.9	2.0	1.9	1.7	2.5	2.2	1.6	2.0	1.4	2.0	1.9
2022	2.0	1.9	2.0	1.6	2.5	2.4	2.0	2.3	1.8	2.0	1.8	2.0
2023	2.0	1.9	1.9	2.1	1.6	2.3	1.9	1.5	1.8	1.8	1.8	1.9
2024	1.9	1.8	1.8	1.8	2.3	2.2	1.9	2.1	1.8	1.8	1.8	1.9
2025	1.9	1.8	1.7	2.3	2.2	2.1	1.8	2.1	1.7	1.8	1.7	1.9
2026	1.8	1.8	1.6	2.2	2.1	2.0	1.7	2.0	1.7	1.7	1.7	1.8
2027	1.9	2.4	1.4	2.1	2.1	2.0	1.6	1.8	2.5	1.7	2.5	2.0

α=1	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI	HR	CEE
2021	2.8	3.0	4.0	3.5	3.4	2.5	4.4	3.4	2.9	3.0	2.9	3.2
2022	3.6	3.0	4.0	3.0	4.8	4.4	4.1	4.5	3.0	2.9	3.0	3.7
2023	3.6	3.0	3.9	3.8	3.4	4.2	4.0	3.3	2.9	3.0	2.9	3.4
2024	3.5	2.9	3.7	3.3	4.6	4.1	3.9	4.3	2.9	2.9	2.9	3.5
2025	3.5	2.9	3.5	4.1	4.5	3.9	3.8	4.1	2.8	2.9	2.8	3.5
2026	3.4	2.9	3.4	2.9	4.3	3.8	3.7	4.0	3.3	2.8	3.3	3.4
2027	3.5	3.6	3.1	3.9	4.1	3.8	3.6	3.8	3.8	3.3	3.8	3.6

Source: Own calculations

[12] Official site of the Government of Croatia, https://vlada.gov.hr/news/thanks-to-it-s-eu-membership-croatia-has-30-billion-at-it-s-disposal-in-this-decade-to-invest-in-economic-growth/32499.

From eleven CEE in our analysis only four use loans under the NRRP and as a share in their RRF resources they are 51% for Romania, 48% for Poland, 40% for Lithuania, and 39% for Slovenia. Theoretically, Canova and Pappa (2021) estimate the cumulative multipliers if only EU grants are used to finance public expenditure and when grants and loans are used. The profile of multipliers for R&D (R&D shock multipliers) and human capital (HD shock multipliers) is lower in the second case, because the taxes, through which the loans must be paid in the future, have a negative effect on the supply of labour and the accumulation of capital. Thus, countries that use only the grant part of the RRF, including Bulgaria, are in a better position to recover, as the multipliers are larger and the government debt is not to jeopardize the recovery of growth at some future date. Moreover, the EU capital transfer investments are expected to effectively increase potential growth to the extent that capital formation increases with the technological improvements from their absorption.

Conclusion

With the new EU initiatives for the 2021-2027 programming period, the CEE countries are going to attract vast EU resources, which should assist in their efforts for fiscal consolidation and sustainable growth. It is necessary to review the structure of public expenditures and redirect expenditures to more public investments, using the European funding under the NRRP and the Partnership Agreement of Bulgaria for 2021-2027. The effective implementation of planned public investments to accelerate growth must be ensured.

The experience gained during the previous program periods is considered a prerequisite for the successful planning and implementation of EU projects and programs for the 2021-2027 program period and our assessment is for gradual fiscal consolidation and annual growth effects from EU funding between 1% and 4% above the baseline scenario for the CEE MS, and cumulative growth between 9 and 24% of GDP, depending on the substitution between European and domestic funding.

Fiscal consolidation is carried out gradually in all CEE MS to stimulate public and private investments and restore growth. Some CEE MS need more efforts as the EC forecast for 2025 shows a still fiscal deficit of 1p.p. to 4 p.p. above the reference level of GDP (Hungary, Poland, Romania, Slovakia). Other CEE MS, including Bulgaria, need to return to the fiscal balance to build up buffers for bad times.

Public policies must be implemented in compliance with the rule for achieving the medium-term budgetary objective for a balanced fiscal balance under the 2023 fiscal and macroeconomic framework. The public finance "spending rule" (limiting fixed current expenditure as a percentage of GDP to a certain level for each country) should build up buffers in good times and stabilize economies in downturns by implementing structural reforms for an ecological transition and support public investment in a sustainable manner.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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POLITICAL SKILL AND TRANSACTIONAL LEADERSHIP ON EMPLOYEE PERFORMANCE: THE MEDIATING EFFECT OF ORGANIZATIONAL WORK CULTURE[8]

Purpose – Previous research has examined political skills and transactional leadership in examining predictors and determinants of employee performance. This study was made necessary by the lack of research on organizational work culture and mediation in the holding industry. This study examines differences in employee performance due to political skills and transactional leadership and examines organizational work culture as a mediating factor. Design/methodology/approach – This study used census sampling techniques. Collect data using questionnaires and analyze research model hypotheses using Confirmatory Factor Analysis and Structural Equation Modeling with SmartPLS. Findings – The data analysis results show that political skills and transactional leadership are not positively related to employee performance and organizational work culture. Organizational work culture also fails to be a mediator, and only the impact of organizational work culture on employee performance is positive and significant. Practical implications – Organizations must do everything possible to ensure an improved adaptable, collaborative, flexible, and team-oriented work culture within the organization, as this is essential to improving performance by providing motivation, embracing innovative ideas, responding to employee complaints, and enabling the organization to survive and thrive. Originality/value – The study provides insights into how and to what extent political skills and transactional leadership variables affect employee performance. This study complements the existing literature and explores the mediating role of organizational work culture. Executives and

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policymakers can use the study's findings to improve organizational work culture in the corporate holding industry. The study opens up possibilities for future research.
Keywords: Political Skill; Transactional Leadership; Employee Performance; Organizational Work Culture
JEL: D23; D63; M21; O15; A13

1. Introduction

The shift in the performance paradigm towards intellectual capital has recently been increasingly debated, especially when the integration of human capital and structural capital as internal resources and an organization's core competencies become inseparable. Human capital refers to the economic value of a worker's skills. It considers human capital as the primary key to an entity that is useful in facing various life challenges, including achieving company performance, one of which is political skill capital and the ability to optimize resources. In addition, the emergence of various new technological innovations must be adopted by companies to accelerate their employee performance sustainably and optimally. Employee performance is the quality and quantity of work attained by an employee in carrying out the responsibilities given (Kim, Chang, 2019), and generally use the 360 multi-score method for assessing performance. Jejen (2021) emphasized that all companies try to have the best, most effective, and most sustainable performance. However, limited internal resources significantly impact facilitating and hindering company performance. Social intelligence, interpersonal influence, rewards, and excellent management are all encouraged. This phenomenon has been explained in the Resource Based View Theory (RBV), which states that maintaining competitive edges lies in having specific essential resources, namely valuable and difficult-to-replicate resources. Companies can acquire benefits if they optimize these resources effectively.

The current business life cycle is seen in financial management, service, promotion, marketing, product quality, and most importantly, the HR management succession. A leader plays an essential role in ensuring that the quality management system implemented by the company goes well, such that the determination, implementation, evaluation, control, and improvement processes must go according to the company's strategic plan. Implementing the interpersonal relationship between a leader and the HR he manages has different styles. However, the most important thing is that a leader can make the entire team achieve and provide performance results (Baharuddin, 2020). It is clear from the perspective of the Resource Based View theory that HR is a strategic source of competitive edge in facing competition (Hamid et al., 2019) and surviving as well as thriving during the economic crisis, mainly what has occurred for several years due to a global pandemic (de Janasz, Crossman, 2018; Shammi et al., 2020). The impact of the pandemic that occurred a few years ago caused socio-economic, employee welfare, work stress levels, work environment, and even psychological health upheaval (Carnevale, 2020). This occurs evenly in companies in both the service and manufacturing sectors (Liu et al., 2020), especially on the subject of this research, one of the holding companies in Indonesia that has four business units and six subsidiaries with centralization in one holding leader based on the Work From Home (WFH) system, when activity restrictions occur due to COVID. The researcher interviewed one of

the managers and conveyed the results. The evaluation results showed that employee performance targets still needed to be achieved, even though all promotional efforts had been made. This is also supported by previous studies, which also stated that marketing factors were not proven to have a positive impact on performance during the pandemic (Dhillon et al., 2023) and Lindeberg et al. (2022), which state that a change in the physical work environment has a stronger relationship with productivity.

Ismael et al. (2021) state that effective leadership has a significant and strategic role in effectiveness and efficiency improvement in organizational goal attainment. Moreover, company development depends on the quality of the company's employees' performance, which is influenced by the leadership (Citrawati, Khuzaini, 2021). Transactional leadership is the right leadership style for encouraging employee performance during WFH since this leadership style emphasizes transactions between leaders and employees to achieve specific goals. Darmasaputra, et al. (2019) state that transactional leadership is a transactional collaborative leadership style that rewards employees for their success in doing particular jobs, while Robbins & Judge (2017) confirm that transactional leadership is a leader who motivates members toward the goals set by giving appreciation for their productivity. A transactional leadership style is also known as a leadership style that encourages the obedience of followers through two factors, namely rewards and punishments. Yukl & Gardner (2020) explain more clearly the mirror of the transactional leader's relationship with employees, namely: (a) leaders know what the employees want and explain what they will get if their work meets the expectations, (b) leaders provide or exchange efforts made by employees by obtaining rewards, and (c) leaders are responsive to employees' interests as long as these interests are proportional to the value of the work done by them.

However, each employee has a different perception of one another, so leaders must have political skills in interpersonal relations. Leaders with good political skills tend to have strong interpersonal influence, high emotional and social intelligence, and adaptability even under unfavourable conditions (Idris et al., 2022). Political skills are precious resources, even very likely to be used negatively to encourage performance improvement, and leaders with influencing and political skills strongly correlate with high employee performance (Mahajan, Templer, 2021). Political skill is one of the leadership competencies to be able to make an organization more effective in understanding other people at work and to use knowledge to influence others to act as they wish to enhance personal and organizational interests through persuasion, deception, and negotiation, which addresses the selection of the most situationally appropriate influence tactics and their successful execution (Mintzberg, 1983). This aligns with the theory of political influence, which states that political power is used to maximize desired rewards, such as company performance or career success (Hayek et al., 2018) and minimize potential negative impacts (Kim et al., 2019). This confirms that individuals who have the power of political skills are needed in organizations because companies will face dynamic work environments.

Some literature shows that political skills are proven to play an essential role in influencing employee performance (Salwan et al., 2019) and have a positive impact on performance (Chong et al., 2023; Demirbağ et al., 2022; Good, Schwepker, 2022), but the results of Gunaedi's research (2018) are not in line with a study that states that political skills do not

affect employee performance. Most of the literature says that transactional leadership style has a positive impact on performance (Adriansyah et al., 2020; Donkor et al., 2022; Lee et al., 2023), but in addition, Thapa & Parimoo (2022) shows that transactional leadership style insignificantly and negatively influences organizational performance. This difference emerged from an empirical gap and previous phenomena, and to cover it, the researcher proposes organizational work culture as a mediator of the relationship between transactional leadership style and political skills on employee performance. Based on previous research suggestions from Paais & Pattiruhu (2020), organizational work culture can mediate between leadership and performance. Organizational work culture in several works of literature has a positive influence on performance, as Ristiana (2019) shows that organizational work culture has a significant positive effect on performance, Darmasaputra et al. (2019) also show that organizational work culture has a significant positive impact on employee performance, as well as Hafulyon et al. (2021) show that organizational work culture has a significant positive effect on employee performance.

Organizational work culture can be an excellent mediator in organizational transformation because the work environment plays a vital role in changing one's behaviour at work. Hafizurrachman et al. (2018) state that organizational work culture is a belief, attitude, and value generally owned and arises in an organization. This means that when an organization's work culture is positive, it will positively impact its performance in facing the challenges of dynamic environmental change. While the leadership style shapes the culture, it will be directed towards organizational agility or vice versa. So, this research is exciting for empirical research to examine and analyze the influence of these variables on holding companies engaged in various business sectors.

2. Literature Review

2.1. Transactional Leadership on Employee Performance

The previous research results stated that transactional leadership has a significant positive effect on employee performance (Adriansyah et al., 2020; Donkor et al., 2022; Lee et al., 2023; Widyacahyani et al., 2020; Darmasaputra et al., 2019). This means that transactional leadership indicators such as contingent rewards, active management by exception, and passive management by exception increase; therefore, performance related to quality, quantity, punctuality, effectiveness, independence, and work commitment will increase in line with the transactional leadership antecedents. Research by Idris et al. (2022) also tested the influence of transformational leadership, political skills, and organizational culture and their effect on employee performance. However, it differs from this study, which focuses on transactional leadership antecedents, since previous research has proven that transactional leadership positively influences employee performance. Leaders who can provide rewards to subordinates based on good performance will have an impact on improving employee performance results, and vice versa; less reward given to employees will make the employee's performance decrease. The description above becomes the basis for making the research hypothesis as follows:

H1. Transactional leadership has a positive effect on employee performance.

2.2. Political Skills on Employee Performance

Social astuteness, interpersonal influence, networking skills, and sincerity are part of political skills. Some literature has avowed that the better one's political skills are, the better performance can be generated in terms of quality, quantity, punctuality, effectiveness, independence, and work commitment. Some of these studies, namely Idris et al. (2022), state that political skill has a significant positive effect on employee performance and are also supported by previous research such as Chong et al. (2023), Demirbağ et al. (2022), Novitasari (2021), and Good & Schwepker (2022). Employees with high political skills tend to be able to improve their performance. On the contrary, low political skills can cause a decrease in performance. Social skills, as one of the main characteristics of influencing others, have a significant role in improving the quality of employee performance (Kim et al., 2019). Next, the political skills possessed by a leader significantly affect employee performance because of their ability to spread values, understand employees, and direct them to work better; therefore, their performance increases. The description above becomes the basis for making the research hypothesis as follows:

H2. Political skills have a positive effect on employee performance.

2.3. Transactional Leadership and Political Skills on Organizational Work Culture

Bassem & Adel's (2018) research shows that leadership and organizational work culture have a significant positive impact, even though the value is weak. Another study that strengthens this influence was carried out by Adriansyah et al. (2020), which states that transactional leadership style significantly positively influences employee work culture. In addition, research conducted by Xenikou (2017) indicates that transformational leadership can create cultural views that are both innovative and transactional. Thus, this literature assumes that when contingent rewards, active management by exception, and passive management by exception from a leader are reasonable, it will increase discipline, openness, mutual respect, and cooperation, which are part of the work culture.

Besides that, research by Idris et al. (2022) shows that political skills positively influence organizational work culture. Political skills strongly correlate with organizational work culture transformation, meaning that when social astuteness, interpersonal influence, networking skills, and sincerity are good, they can increase discipline, openness, mutual respect, and cooperation. The work culture continues to change; therefore, the adaptability of political skills becomes a requirement to improve performance. So, this research assumes that the requirements or characteristics of political skills are crucial social capital for leaders to create the desired values in the organization. The description above becomes the basis for making the research hypothesis as follows:

H3. Transactional leadership has a positive effect on organizational work culture.

H4. Political skills have a positive effect on organizational work culture.

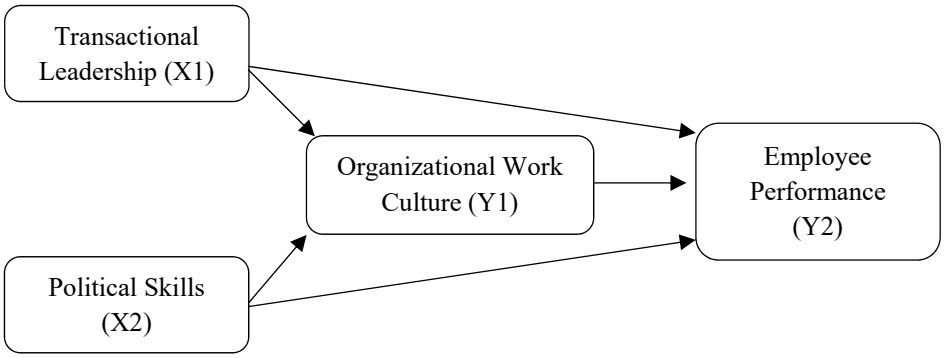
2.4. The Influence of Organizational Work Culture on Employee Performance

Shahriari & Allameh (2020) stated that organizational work culture has a significant positive effect on employee performance, in line with Bassem & Adel (2018), Abdullah et al. (2021), Aboramadan et al. (2019), Al-Musadieq et al. (2018), Shahriari & Allameh (2020), and Darmasaputra et al. (2019). This means that when discipline, openness, mutual respect, and cooperation, which are parts of the employee's work culture increase, performance indicators in terms of quality, quantity, timeliness, effectiveness, independence, and work commitment will also increase. Moreover, Ristiana (2019) shows that the variables of organizational work culture and job satisfaction significantly influence service and performance quality. This is in line with the findings of Paais & Pattiruhu (2020), which state that organizational work culture is a predictor that plays a vital role in encouraging performance, apart from compensation and satisfaction factors. Recalling that job satisfaction is essential in employee performance to produce optimal work for organizational goals can be achieved. Then, researchers assume that an excellent organizational work culture will improve employee performance and accelerate the attainment of organizational goals. The description above becomes the basis for making the research hypothesis as follows:

H5. Organizational work culture has a positive effect on employee performance.

Based on the study and evaluation of different research findings, the literature review, and the relationships between the variables as mentioned earlier. Figure 1 presents the research framework.

Figure 1. Research Mind Map



3. Research Method

The subjects studied were employees at holding companies engaged in various business sectors, while the objects of this study included transactional leadership, political skills, work culture, and employee performance. The research design is explanatory research with a quantitative approach based on statistical information from primary data built on the philosophy of positivism to test the hypotheses set with SmartPLS software. The population in this study was 135 holding company employees. Then, the sampling model used is nonprobability sampling with the method of sample determination using a census, a sampling

technique utilized when all population members are used as samples. Data was collected using a questionnaire consisting of instrument statements and indicator statements for each variable on a Likert scale of 1-5, which means 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree).

Validity and reliability tests were carried out by looking at Convergent Validity (correlation value > 0.50), Discriminant Validity (relationship between the indicator and its construct > its relationship with other constructs), and Composite Reliability (having a value above 0.70). Next, the Model Test is carried out. The next stage is to test the hypothesis. The hypothesis is said to be accepted when the P- value < 0.05 or T statistic > T table. Meanwhile, mediation analysis is done by looking at Direct Effect (DE) > Total Effect (TE).

The establishment of the research instrument refers to the definition of research indicators. The variables, indicators, and instrument statements are as follows: The variable indicator of transactional leadership consists of three indicators (Bass et al., 2003) equipped with statements that have been developed by the authors, namely:

1. Contingent rewards: "My leader directs the execution of tasks based on the job desk, motivates them to complete work, and gives rewards when work targets are attained."
2. Active Management by Exception: "My leader always supervises work processes, corrects every mistake I make, and always pays attention to SOP deviations."
3. Passive Management by Exception: "My leader gives warnings, sanctions, and coaching when work does not meet the standards/targets."

Political Skills variable indicators consist of three indicators (Ferris et al., 2007) equipped with statements that have been developed by the authors, namely:

1. Social astuteness: "My leader identifies alternative resolutions to solve complaints, responds quickly to problems, and proactively establishes relationships with the work environment."
2. Interpersonal Influence: "My leader has expertise in influencing employee attitudes, establishing bonds with each employee, and always convincing in every explanation."
3. Networking Ability: "My leader can build, stabilize, and improve stakeholder relationships."

The indicator for the Organizational Work Culture variable consists of three indicators (Adikumoro et al., 2022) equipped with statements that have been developed by the authors, namely:

1. Discipline: "I arrive on time according to schedule, be assertive in carrying out tasks, and confident in making decisions."
2. Openness: “I can channel aspirations directly and establish good communication with other employees.
3. Mutual Respect: My colleagues respect each other's opinions, support them, and heed their opinions.

Performance variable indicators consist of three indicators (Hadi et al., 2023) equipped with statements that have been developed by the authors, namely:

1. Quantity of Work: "I managed to attain the target in completing the volume of work punctually."
2. Quality of Work: "I do work according to the SOP skillfully and have a sense of responsibility."
3. Work effectiveness: "I provide innovative ideas, complete work without waiting for orders, and exceed company targets."

4. Results

4.1. Data Respondents Characteristics

The results of this research are divided into several sections according to the chosen methodology. The characteristics of the respondents categorized by gender, age, education, and years of service can be seen in Table 1.

Table 1. Respondents Characteristics

Characteristics of Respondents Based on Gender		
Gender	Frequency	%
Male	53	40
Female	47	35
Did not fill	35	25
Total	135	100
Characteristics of Respondents by Age		
Age (years)	Frequency	%
20-30	25	18
31-40	28	21
41-50	37	27
≥ 51	10	8
Did not fill	35	26
Total	135	100
Characteristics of Respondents based on Last Education		
Last Education	Frequency	%
High school or equivalent	30	22
D3/D4	15	11
S1	43	32
S2	12	9
Did not fill	35	26
Total	135	100
Characteristics of Respondents Based on Years of Service		
Working Period (year)	Frequency	%
≤ 5	26	19
6-10	24	18
11-20	37	27
≥ 21	13	10
Did not fill	35	26
Total	135	100

One hundred respondents filled out the questionnaire, and the initial target population was 135 employees. Researchers have coordinated, but the number of respondents has stayed the same, so the researchers decided to cut off 100 respondents who had filled out the questionnaire. The response characteristic data shows that men dominate employees in the company at 40%, women at 35%, and the rest are unknown because they did not complete the questionnaire. This data also shows the characteristics of respondents based on age, most of whom are between the ages of 40-50, dominated by undergraduate graduates, and the most extended number of years of work is 11-20 years.

4.2. Instrument Test Result

4.2.1. Convergent Validity

The results of the convergent validity instrument test show that all indicators of the variable transactional leadership, political skills, organizational work culture, and employee performance have an outer loading value of > 0.5 and that all indicators are said to be valid, as shown in Table 2.

Table 2. Loading Factor Indicator Value for Each Variable

Transactional Leadership	
Indicator	Outer Loading
Contingent Rewards	0,934
Active Management by Exception	0,937
Passive Management by Exception	0,946
Political Skills	
Social Astuteness	0,971
Interpersonal Influence	0,962
Networking Capability	0,979
Organizational Work Culture	
Discipline	0,817
Openness	0,911
Mutual Respect	0,847
Employee Performance	
Quantity of Work	0,906
Quality of Work	0,939
Work Effectiveness	0,839

4.2.2. Convergent Validity

The reliability test result using either Cronbach's Alpha or Composite Reliability is> 0.7. Therefore, it can be concluded that the variables tested are valid and reliable, as shown in Table 3.

Table 3. Reliability and Validity Constructs

Variable	Cronbach's Alpha	CompositeReliability	Average Variance Extracted (AVE)
Organizational Work Culture	0,821	0,894	0,738
Transactional Leadership	0,933	0,957	0,882
Political Skills	0,970	0,980	0,942
Employee Performance	0,878	0,924	0,802

4.2.3. Structural Model Analysis

After modifying the model to obtain the best model, Figure 2 is the structural model.

Figure 2. Structural Model

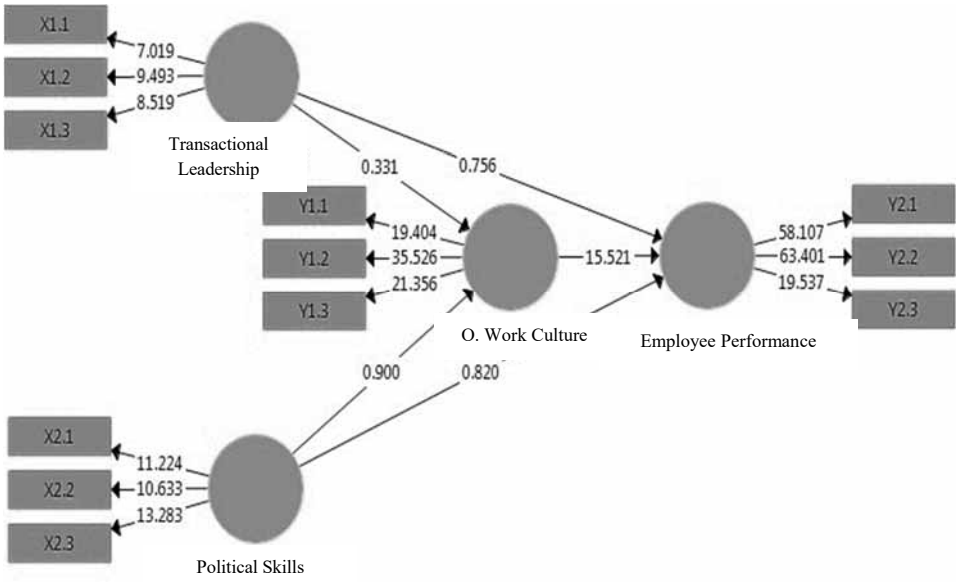


Table 4. R Square value

Variable	R Square	R Square Adjusted
Organizational Work Culture	0.058	0.039
Employee Performance	0.551	0.537

Assessing the model begins by looking at the R-square, presented in Table 4. Table 4. shows that the R-Square value for the organizational work culture value variable is 0.058, which means the model can explain 5.8% of the variables that affect organizational work culture. The employee performance variable has a value of 0.551, which means that the model can explain 55.1% of the variables that affect employee performance. Besides that, the calculation of the Q-Square predictive relevance is at 0.307, where the value is greater than zero. It indicates that the model has a predictive relevance that can explain the model of 0.307, or 31%. This research indicates that organizational work culture has minimal impact on employee performance, so adding other variables not used in this research is necessary. This research suggests that organizational work culture has minimal impact on employee performance. So, it is required to add other variables that are not used in this research.

4.3. Hypothesis Analysis

The basis used in testing the hypothesis is the value in the output result for inner weight. The following output estimate table shows only the influence of organizational work culture and

performance, which has a P-value of 0.000 < 0.05 and a T-statistic 15.521 > t-table (1.960), which means this hypothesis is proven. The other hypotheses are not proven, as shown in Table 5 in this study.

Table 5. Result for Inner Weight

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Sta. (O/ STDEV)	P-Value	Status
O. Work Culture -> Employee Performance	0.743	0.747	0.048	15.521	0.000	Proven
Transactional Leadership -> O. Work Culture	0.071	0.109	0.214	0.331	0.741	Not Proven
Transactional Leadership -> Employee Performance	0.119	0.137	0.157	0.756	0.450	Not Proven
Political Skills -> O. Work Culture	0.177	0.152	0.196	0.900	0.369	Not Proven
Political Skills -> Employee Performance	-0.128	-0.141	0.156	0.820	0.413	Not Proven

4.4. Mediation Analysis

The results of the mediation analysis are shown in Table 6. Variable X1 has an indirect effect (IE) value of 0.053 with P-values of 0.740 (greater than 0.05), meaning that the indirect effect of transactional leadership (X1) on employee performance (Y2) through organizational work culture (Y2) is also not proven. Meanwhile, the variable X2 has an indirect effect (IE) value of 0.131 with a P-value of 0.376 (greater than 0.05), meaning that the indirect effect of political skills (X2) on employee performance (Y2) through organizational work culture (Y1) is not proven.

Table 6. Mediation Effect

VAR.	Direct Effect (DE) Xi->Y2	Indirect Effect (IE) Xi->Y1->Y2	Total Effect (TE) (DE+IE)	Mediation Effect TE-DE
(1)	(2)	(3)	(4)	(5)
X1	0,119 (0,450)	0,053 (0,740)	0,172 (0,471)	(0,172-0,119) = 0,053
X2	-0,128 (0,413)	0,131 (0,376)	0,003 (0,989)	(0,003+0,128) = 0,131

5. Discussion

5.1. The Effect of Transactional Leadership on Employee Performance

Transactional leadership in this study shows a positive direction but does not significantly affect employee performance, with a P-value of 0.450 > 0.05. These results indicate that the transactional leadership style does not affect performance at the holding company and that another leadership style always seeks to provide instructions and listen to employee input regarding decisions made and innovative ideas submitted by employees. Differences in previous research results in the implementation of performance theory, especially those presented by Robbins & Judge (2017), are common since different research locations,

research subjects, and research time are factors that can determine the relationship between transactional leadership and employee performance. This research does not support previous research that becomes the basis for the hypotheses, such as the research conducted by Darmasaputra & Sudibya (2019), Widyacahyani et al. (2020), Adriansyah et al. (2020), Donkor et al. (2022), and Lee et al. (2023), which indicate that there is a positive effect of transactional leadership style on employee performance, with the support of Thapa & Parimoo (2022), which shows that transactional leadership style has no significant effect on employee performance. Thus, it can be concluded that transactional leadership has no significant effect on the performance of employees at holding companies.

This result is unique because most previous research shows that transactional leadership positively impacts performance. This can be an insight for leaders to differentiate implementation strategies for managing employees during normal and abnormal situations, such as when this research occurred during a pandemic. The leader's role is to motivate employees to work optimally by giving awards, as imbalance does not affect employee performance. What is needed at that time is not giving rewards or imbalance, but the most important thing is health. The pandemic atmosphere is so tense that it is very worrying, so they only think about how to save themselves and their families. This is an important finding, especially for business practitioners. The leadership style needed is not only rewarding or transactional but can also make efforts to provide specific instructions to employees, explain decisions that have been made, and provide encouragement to employees; therefore, work can be completed and meet the quantity and quality targets, as well as predetermined time limits.

5.2. The Effect of Political Skills on Employee Performance

Political skills show a positive direction but do not significantly affect employee performance, with a P-value of 0.413>0.05. Political skills show insignificant results, meaning that social acumen, interpersonal influence, and networking skills do not affect employee performance. A leader in an organization should need political skills to understand other people, exert interpersonal influence, and act for the interests of individuals or organizations, which can later motivate employees to achieve high performance, but this is not proven in this study. According to Templer et al. (2021), employees with good political skills, such as networking skills, interpersonal influence, good social intelligence, and sincerity in socializing with others can improve employee performance. However, empirically, some employees referred to as toxic employees have dark personality characteristics (low honesty and lack of humility) and are often found to have much higher income and salary than other employees, even being elected as leaders. This is because supervisors clearly understand social interactions and accurately interpret their own and other people's behaviour. Conversely, supervisors allow people to adapt and calibrate their behaviour to different situations and are seen as valuable and necessary for successful personal and organizational gains.

The research results show that differences in the political skills theory implementation are common because of the differences in research locations, research subjects, and research time, which are factors that can determine the relationship between political skills and

employee performance. This research does not support previous research that became the basis for making the research hypotheses, including the research conducted by Idris et al. (2022), Chong et al. (2023), Demirbağ et al. (2022), Novitasari (2021), and Good & Schwepker (2022), which states that there is a positive influence of political skills on employee performance. However, Kistyanto (2018) supports this research, saying that political skills do not significantly positively affect employee performance due to the period of employment. The results of the respondent's characteristics in the category of years of service mainly were less than five years, at 26%. This percentage perhaps indicates low political skills because employees are still inexperienced with working conditions. In addition, research by Hayek et al. (2018) in the Ecuadorian context also avowed that political skills have a positive direction but are not significant towards performance. Understanding the influence of political skills will have the consequence that human resource development is essential to building employee-management relationships that can lead to sustainable competitive edges. Political skills in understanding employees and providing performance motivation cannot be carried out optimally because health is needed during the pandemic. The tense atmosphere of the pandemic is so worrying that all they think about is how to save themselves and their families. This is an important finding, especially for business practitioners. Thus, it can be concluded that political skills did not significantly affect employee performance during the pandemic.

5.3. The Effect of Transactional Leadership on Organizational Work Culture

Transactional leadership is not proven to significantly affect organizational work culture because the P-value is 0.741>0.05. This means that when transactional leadership only emphasizes interpersonal transactions between leaders and employees involving exchange relationships, it will not have a direct effect on employee work culture, even though Robbins & Judge (2017) state that a healthy work culture will lead to better organizational development because all aspects of the organization can be influenced by culture, especially employee behaviour and perspectives about their work. This research is supported by Bassem & Adel (2018), who indicate that transactional leadership style has no significant effect on employee performance. Leadership should create a strong culture within the organization through the unity of norms, values, and beliefs since it can increase efficiency and effectiveness, communication, and mutual understanding. In addition, creating a solid work culture can help team members with different cultural backgrounds improve their performance. The holding company has hired employees who have quality and are following the work fields; therefore, they can maximize their potential and eventually affect employee performance. Based on the results of the analysis above, it is proven that the existence of a transactional leadership style does not affect organizational work culture. This can happen due to the organization’s work culture, which has been formed for quite some time and is not influenced by periodic transactional leadership styles. This implication is interesting for practitioners, when something unusual happens, the handling is also exceptional, such as during a pandemic. Mainly how a leader influences work culture because conditions, jobs, and situations are different, thus, it can be concluded that transactional leadership does not affect organizational work culture.

5.4. The Effect of Political Skills on Organizational Work Culture

Understanding the influence of political skills in human resource development is significant because it can build employee-management relationships that can lead to sustainable competitive advantages (Hayek et al., 2018). Political skills are individual skills in understanding other people and using the knowledge they have in order to act according to their wishes for personal and organizational interests (Idris et al., 2022). Based on the results of this study, it is indicated that political skills do not affect organizational work culture, with a P-value of 0.369 > 0.05. Political skills consisting of social acumen, interpersonal influence, and networking skills do not affect organizational work culture. An organization leader needs to understand other people, exert interpersonal influence, and act for the interests of individuals or organizations, which in turn can motivate employees to achieve high performance and later emerge as an organizational work culture.

The results of this study are not in line with previous research from Idris et al. (2022), Bassem & Adel (2018), Abdullah et al. (2021), Aboramadan et al. (2019), Al-Musadieq et al. (2018), Shahriari & Allameh (2020), and Darmasaputra et al. (2019). Where support from a leader contributes to the growth of a positive organizational work culture, leader support that will bring positive behaviour to influence organizational work culture affirms that individuals who have the power of political skills are needed in organizations because companies will face a dynamic work environment. The political skills of a leader should be able to create a positive work culture; therefore, an organization can be effective when the work culture raised by a leader leads to the achievement of organizational goals since a leader is the one who can provide support and make his subordinates feel cared for and will find it easier to do the job. Based on the analysis above, it can be concluded that political skills do not affect organizational work culture.

5.5. The Influence of Organizational Work Culture on Employee Performance

The results showed that organizational work culture significantly positively affects employee performance, with a P-value of 0.000<0.05. This means that the higher the organizational work culture shown by employees at work, it will have an impact on improving performance. Robbins & Judge's (2017) approach identifies that organizational work culture is a variety of systems created for its members; therefore, they can differentiate one organization from another. A healthy work culture will lead to better organizational development because all aspects of the organization can be influenced by culture, especially the behaviour and perspective of the employees about their work. The results of this study are supported by Bassem & Adel (2018), Abdullah et al. (2021), Aboramadan et al. (2019), Al-Musadieq et al. (2018), Shahriari & Allameh (2020), and Darmasaputra et al. (2019), who state that organizational work culture has a positive effect on efforts to increase employee performance. A positive work culture will create an excellent corporate culture and also reflect that this culture already has strong roots, which can be imbued and actualized in daily work.

This research has important implications for managers, including encouraging employee performance by strengthening adaptive, collaborative, flexible, and team-oriented aspects.

This research is also supported by Paais & Pattiruhu (2020), who state that organizational work culture is a predictor that plays an essential role in encouraging employee performance. It was also supported by Idris (2019), who avowed that organizational work culture strongly correlates with employee performance. Culture in an organization has a function as a guide for employees to behave and carry out their responsibilities. The results of this study also state that work cultures such as flexibility, cooperation, responsibility, and risk-taking can help employees make decisions in various conditions and solve work problems. The results of this study indicate that the organizational work culture variable has a positive and significant influence on employee performance improvement efforts.

5.6. Transactional Leadership and Political Skills on Employee Performance through Organizational Work Culture

The results of the hypothesis testing indicate that organizational work culture cannot mediate the effect of transactional leadership on employee performance. The magnitude of the indirect effect of the coefficient value is 0.740, with a t-statistic value of 0.332. This shows that organizational work culture does not play an essential role in significantly mediating the influence of transactional leadership variables on employee performance. In addition, the original sample total effect (0.172) > original sample direct effect (0.119), and the total effect as well as the direct effect are not significant. This shows that transactional leadership does not significantly affect employee performance through organizational work culture as a mediating variable. This research does not support the research of Darmasaputra Sudibya (2019). Therefore, further research is needed to explore the mediating role of organizational work culture since logically, organizational work culture has a role in influencing organizational leadership style in attaining optimal performance.

Organizational work culture can also not mediate the effect of political skills on employee performance; therefore, the hypothesis is not proven. The magnitude of the indirect effect of the coefficient value is 0.376, with a t-statistic value of 0.887. This shows that organizational work culture does not play an essential role in influencing political skills on employee performance because there is and is not an intervening variable. Thus, political skills do not affect employee performance, as the t-statistic value is less than 1.960. While the original sample total effect (0.003) > original sample direct effect (-0.128), the total effect and immediate effect are not significant, meaning that the organizational work culture variable as a mediator does not play a role in influencing political skills on employee performance.

This study does not support the research of Idris et al. (2022), which states that political skills affect employee performance mediated by work culture. Also, research by Gunaedi & Kistyanto (2018) shows that political skills do not directly impact employee performance. Assessed from the descriptive analysis, it indicates that the period of employment less than five years has a portion of 26% could be caused by employees of working age who have not long had skills and experiences with the working environment conditions, which are still low.

6. Conclusion

This study shows that transactional leadership and political skills do not affect employee performance or organizational work culture. This study's results are unique since out of the five hypotheses used, only one has proven to have an influence. This is natural because of the differences in research locations, subjects, and time as factors that can determine this influence. Meanwhile, the proven hypothesis is that organizational work culture really influences performance because it can encourage employees to carry out their duties and responsibilities satisfactorily. This research has important implications for organizations to try and do everything possible to ensure the improvement of an adaptive, collaborative, flexible, and team-oriented work culture within the organizations because it is critical in improving performance by providing motivation, accepting innovative ideas, and responding to employee complaints. Hence, organizations are able to survive and continuously grow.

The limitations of this study are that the antecedent used to see employee performance only utilized two variables, namely transactional leadership and political skills, and the organizational work culture as a mediation. At the same time, there are many other antecedents that can be an antecedent, such as compensation, job satisfaction, and Total Quality Management, which are predictors in monitoring and improving performance. Then, the number of samples in this study is limited to only 100 respondents in one holding company. Thus, further research can increase the number of subjects and research samples. In addition, conducting an in-depth study using an in-depth interview method to obtain a more detailed description of the answers is necessary to deepen the findings of the four unsupported hypotheses. With that, a more precise analysis is expected to be produced to reveal why transactional leadership and political skills do not affect employee performance.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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DOES ETHICAL LEADERSHIP CONSTRAINT EARNINGS MANAGEMENT PRACTICES? A SYSTEMATIC LITERATURE REVIEW AND CONTENT ANALYSIS[3]

The study presents a systematic literature review on earnings management and ethical leadership using the content analysis method. Secondary sources of data from academic journals were utilized to address the issue of earnings management. A total of 112 articles, spanning the period from 1977 to 2022, were examined. The study explores the theoretical aspects of earnings management and the conceptualization and operationalization of ethical leadership. The selected articles underwent a systematic review process, and a content analysis was conducted to provide a structured overview of the existing scholarship in this field. Effective ethical leadership plays a crucial role in overseeing and minimizing manipulated earnings. Therefore, this study contributes to the literature by suggesting ethical leadership as a means to mitigate earnings manipulation. This article is distinguished as one of the pioneering works that provides a thorough analysis of the literature on ethical leadership and earnings management. The findings of this study will be valuable to organizations aiming to reduce earnings management practices and improve the quality of financial reporting.
Keywords: Content analysis; discretionary accruals; earnings management; ethical leadership; ethical perspective
JEL: M12; M41; A13

1. Introduction

In recent decades, there have been numerous business scandals that have brought attention to the ethical implications surrounding the financial reporting process (Huang et al., 2020; Monteiro et al., 2022; Zhu et al., 2016). Chen (2010) emphasized that these instances were

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[3] This paper is a revised and expanded version of a paper entitled "*The Role of Ethical Leadership in Constraining Earnings Management Practices: A Survey of Literature,*" presented at The 5th International Conference on Applied Research in Business, Management, and Economics in Italy on October 28, 2022.
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primarily driven by a lack of moral traits, such as integrity, and that unethical executives could engage in fraudulent activities, such as earnings management, to serve their own financial interests. The connection between business failures and immoral leadership behaviours has been highlighted by several researchers (Madanchian et al., 2018; Ponnu & Tennakoon, 2009). This highlights the importance of ethical leadership in maintaining the integrity and credibility of financial reporting and mitigating the risks of fraudulent practices. Unethical behaviours at the leadership level can have far-reaching consequences, impacting not only the financial stability of organizations but also eroding the trust of stakeholders and damaging the overall business environment (Cheng et al., 2023).

In addition to defining the concept of earnings management, the literature on this topic delves into various aspects. It explores sample selection methodologies and techniques for assessing earnings management, and, importantly, endeavours to uncover the underlying reasons why executives engage in manipulating reported earnings. The results and explanations provided in these studies have generated widespread interest among researchers and practitioners alike (Jiang, 2020; Nekhili et al., 2022; Taylor et al., 2023). The motivation behind earnings management is the central focus of these articles. They examine the various incentives and pressures that drive executives to manipulate earnings, such as meeting financial targets, securing bonuses or favourable stock prices, avoiding regulatory scrutiny, or influencing investor perceptions. Understanding these motivations is crucial for developing effective strategies to minimize earnings management and promote ethical financial reporting practices (Wu, Zhou, 2022).

While a substantial amount of research has contributed to the understanding of the motivations behind earnings management (e.g., Chen, Tsai, 2010; Monteiro et al., 2022), there have been limited studies that focus on strategies or methods designed to reduce earnings management, especially from an ethical perspective (Elias, 2002; Donegan et al., 2017). Nevertheless, it is crucial to identify and explore these ethical techniques to ensure accurate and reliable financial reporting. This will help maintain stakeholder trust and confidence in the integrity of organizations. Moving forward, research efforts should focus on understanding the motivations behind earnings management and developing ethical frameworks and practices that discourage and mitigate such behaviour (Habib et al., 2022).

The current research aims to comprehensively examine and integrate existing scientific studies on whether ethical leadership can reduce earnings manipulation. A thorough review of prominent research from 1977 to 2022 was conducted to formulate and define the concept of ethical leadership. Subsequently, it proposed ethical leadership as an effective approach to curbing the prevalence of earnings manipulation practices, which is a pioneering contribution in the literature. The significance of this study lies in its relevance to the accuracy of financial reports. Stakeholders heavily rely on the information disclosed in annual reports to make informed economic judgments. As mentioned earlier, earnings management can negatively impact the accuracy of financial statements. Therefore, it is crucial to explore strategies that address this issue and ensure the protection of users who may potentially receive misleading information.

The rest of this article is organized as follows. The second section presents the theoretical framework, the third section discusses the methodology, which includes the criteria for article selection, the methods and sources employed in the paper's selection process, and

the approach taken to analyze the chosen articles. The fourth section provides the results and discussion. Finally, the fifth section offers the research conclusion and future research directions.

2. Theoretical Framework

The literature revealed a lack of consensus on the definition of the term "earnings management," with various interpretations in research that aimed to uncover earnings manipulation or provide convincing evidence of its motivations (Rahman et al., 2023). However, the first definition was established by Davidson et al. (1987), who defined earnings management as "the process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about a desired level of reported earnings (p. 17)."

Moreover, the definition of earnings management most commonly used is provided by Healy and Wahlen (1999). They observed earnings management as "the use of judgment in financial reporting and structuring transactions to change financial reports in order to either mislead certain stakeholders about the underlying economic performance of the company or influence contractual outcomes that depend on reported accounting numbers (p. 368). " Additionally, Schipper (1989) stated that "earnings management is the intentional intervention in the external financial reporting process, with the aim of achieving some private benefit (p. 92)." She also added that "actual earnings management is achieved by timing investment or financing decisions to alter reported earnings or a portion of it (p. 92)."

The aforementioned scholarly definitions were extensively reviewed in the study of Dechow and Skinner (2000). They inferred that these definitions were primarily concerned with the unobservable management intent. They also claimed that these definitions stated unequivocally that earnings management strategies were permissible under International Financial Reporting Standards (IFRS) or Generally Accepted Accounting Principles (GAAP).

A significant critique of these definitions arises from the challenge of differentiating between fraudulent activities and earnings management (Dechow & Skinner, 2000). This issue is heightened by the fact that both practices share similar motivations and engage in comparable activities, such as misleading financial statement users for personal gain and causing harm to shareholders through the dissemination of deceptive information (Toumeh, 2022). However, the literature is divided on how to distinguish between fraud and earnings management (Elias, 2002; Habib et al., 2022).

In this regard, Dechow and Skinner (2000) developed a paradigm to differentiate between fraudulent activities and earnings management practices. The theoretical distinction is based on whether management's accounting choices comply with GAAP/IFRS or exceed them. Accounting choices that violate accounting standards are considered fraudulent activities, as they are intended to mislead financial statement users. On the other hand,

certain managerial decisions that are in line with accounting standards are seen as bold yet acceptable practices that give managers the opportunity to exercise accounting discretion.

Furthermore, Ronen and Yaari (2008) categorized earnings management definitions into three different groups: black, grey, and white. They defined "beneficial (white) earnings management as the utilization of accounting treatment flexibility to communicate the manager's private information on future cash flows." They described "neutral (grey) earnings management as the selection of accounting treatment that is either opportunistic (aimed at maximizing the utility of management only) or economically efficient." Lastly, they explained, "pernicious (black) earnings management as the practice of employing deceitful tactics to misrepresent or reduce the transparency of financial reports (p. 25)."

The first and second definitions emphasized the managerial prerogative to choose the most appropriate accounting method within the limits set by IFRS and GAAP. If these standards permit multiple choices for recognizing, evaluating, presenting, or disclosing an institution's economic events, and managers select one method over another, it would not be considered fraud, but it could be seen as creative accounting. Additionally, Ronen and Yaari (2008) argued that fraudulent activities should fall under the definition of black earnings management.

On the other hand, Yukl et al. (2013) and Brown et al. (2022) highlighted the conceptual ambiguity that is prevalent in the literature on ethical leadership. They discussed the extent and evaluation of ethical leadership, emphasizing the importance of certain dimensions that should receive attention from scholars. These dimensions included honesty, integrity, effective communication, enforcement of ethical standards, equitable distribution of rewards, acts of kindness, compassion, and a disposition towards altruism. Researchers can contribute to a more comprehensive understanding of ethical leadership and its impact on organizational dynamics, employee behaviour, and the overall ethical climate by identifying and prioritizing these topics. These insights have the potential to guide the development of frameworks and interventions that aim to foster ethical leadership practices and create a culture of integrity within organizations.

Trevino et al. (2003) conducted a qualitative investigation using interviews to gain a deeper understanding of ethical leadership. They interviewed top management and ethics officers to discuss the concept of ethical leadership. The respondents highlighted the importance of defining ethical leadership in terms of both ethical traits (such as honesty, trustworthiness, and integrity) and a transactional component. This means that ethical leaders should utilize the organization's system of incentives and punishments to steer their followers towards ethical behaviour.

However, there are several definitions of ethical leadership. According to Brown et al. (2005), ethical leadership is defined as "demonstrating appropriate conduct based on norms through personal actions and relationships, and promoting such conduct to followers through two-way communication, reinforcement, and decision-making (p. 120)." Their study also found that followers perceive managers as authentic and trustworthy leaders when they exhibit qualities such as honesty, trustworthiness, fairness, and care. Additionally, Kul (2017) defined ethical leadership as "a leadership style that embodies universal values such as reliability, impartiality, and justice, and reinforces these values

through two-way communication with followers and encourages the development of moral thinking (p. 564)."

Honesty, trustworthiness, and fairness are qualities commonly associated with ethical leadership. These characteristics demonstrate that leaders are practising fairness and their behaviours can be predicted (Mihelic et al., 2010; Yuan et al., 2023). In this regard, Trevino et al. (2000) identified two key pillars of ethical leadership, which are presented in Table 1. The first pillar is being a moral manager, which encompasses a leader's identity, actions, and decisions. This requires leaders to be honest and trustworthy. The second pillar relates to acting as a Chief Ethics Officer (CEO). This involves understanding how to influence followers' behaviour by serving as a role model for ethical conduct, effectively communicating moral values to followers, and implementing appropriate disciplinary measures in line with ethical standards. However, Trevino et al. (2000) argued that ethical leadership necessitates both elements, highlighting that simply having personal ethics is insufficient.

Table 1. The Two Pillars of Ethical Leadership

	Moral Person	Moral Manager
Traits	Integrity Honesty Trustworthiness	Role modelling through visible action
Behaviours	Do the right thing Concern for people Being open Personal morality	Rewards and discipline
Decision-Making	Hold to values Objective/Fair Concern for society Follow ethical decision rules	Communicating about ethics and values"

Source: Trevino et al. (2000).

Regarding the measurements of ethical leadership, various metrics have been developed to evaluate and frameworks have been established to assess the constituent elements of ethical leadership. The Perceived Leader Integrity Scale (PLIS) questionnaire was created by Craig and Gustafson (1998) to determine leaders' ethical integrity. They initially identified seven behavioural domains associated with ethical leadership, including training and development, resource/workload allocation, truth-telling, unlawful discrimination, compliance with policies and procedures, maliciousness, and self-protection. Eventually, they developed 31 items that described unethical situations involving leaders. Examples of these items included statements such as "my supervisor would risk me to protect himself/herself in work matters," "my supervisor would use my performance appraisal to criticize me as a person," "my supervisor would falsify records if it would help his/her work situation," and "my supervisor would do things which violate organizational policy and then expect his/her subordinates to cover for him/her." Participants were asked to rate their responses using a range of options, including "not at all," "somewhat," "very much," and "exactly," which corresponded to numerical values 1, 2, 3, and 4, respectively.

Subsequently, Parry and Proctor-Thomson (2002) validated the PLIS, determining that it was a suitable measure for assessing and identifying the perceived integrity of managers at different levels within the organization. However, they argued that some items in the PLIS were not relevant to peer ratings of integrity. Consequently, they made a few minor adjustments to the scale, removing three items and rewording nine others to ensure they were more appropriate for respondents. This led to the development of a redesigned scale called the Perceived Leader Integrity Scale-Revised (PLIS-R).

Brown et al. (2005) developed an instrument known as the Ethical Leadership Scale (ELS) consisting of ten items. Participants rate each item on a scale of 1 (strongly disagree) to 5 (strongly agree). Examples of the items included: "My leader conducts their personal life in an ethical manner," "My leader makes fair and balanced decisions," and "My leader defines success not only by results but also by the way they are achieved." The ELS was used to assess the predictive validity of ethical leadership on various employee outcomes, such as honesty, trustworthiness, leaders' perceived effectiveness, employees' job satisfaction and dedication, and reporting problems. Many scholars successfully utilized the ELS in their empirical research (e.g., Shin et al., 2015; Kul, 2017; Mayer et al., 2012; Stouten et al., 2013; Madanchian et al., 2018; Ponnu, Tennakoon, 2009).

Finally, a multidimensional Ethical Leadership at Work Questionnaire (ELW) was developed by Kalshoven et al. (2011) to assess various forms of ethical leadership based on seven ethical leader traits: fairness, integrity, ethical guidance, people-orientation, power-sharing, role clarification, and concern for sustainability. The ELW instrument has 38 items, each of which has a 7-point rating scale response format (1=strongly disagree to 7=strongly agree). Examples of the items included people orientation (7 items; e.g., my manager cares about his/her followers), fairness (6 items; e.g., my manager pursues his/her own success at the expense of others), power-sharing (6 items; e.g., my manager does not allow others to participate in decision making), concern for sustainability (3 items; e.g., my manager would like to work in an environmentally friendly manner), ethical guidance (7 items; e.g., my manager explains what is expected from employees in terms of behaving with integrity), role clarification (5 items; e.g., my manager explains what is expected of me and my colleagues), and integrity (4 items; e.g., my manager can be relied on to honour his/her commitments). On the other hand, Kalshoven et al. (2011) used a 10-item unidimensional short-scale ELS that was previously developed by Brown et al. (2005) to assess ethical leadership.

Turning to the implications of the theory, the social learning theory proposed by Bandura (1977, 1986) prompted many scholars to investigate the significant impact of ethical leadership. Scholars, such as Giessner and Quaquebeke (2010), Brown et al. (2005), Shin et al. (2015), Mayer et al. (2010), and Mayer et al. (2012), recognized that this theory provides a solid foundation for understanding ethical leadership. By studying observation, imitation, and reinforcement within social learning theory, researchers gained valuable insights into how ethical leaders can shape the behaviour and moral decision-making of their followers. The theoretical basis of social learning theory has been crucial in advancing the understanding of how ethical leadership can impact individual and organizational outcomes. This, in turn, contributed to the development of effective strategies for fostering ethical leadership in various contexts.

According to the social learning theory, leaders play a crucial role as compelling and socially acceptable ethical role models for their followers. Exhibiting behaviours aligned with established norms and motivating themselves through altruistic motives, leaders effectively influence the ethical conduct of their followers (Brown et al., 2005). This notion is reinforced by the observations made by Kalshoven et al. (2011), who emphasized that followers closely observe the behaviours of their leaders and tend to imitate or mimic those actions. For instance, when leaders consistently demonstrate honesty, fairness, and respect towards their employees, it sets a precedent for how employees perceive and interact with others. They are likely to mirror the ethical behaviours exhibited by their leader, attributing their actions to the example set by their leader. Consequently, the leader's conduct becomes a powerful influence that shapes the ethical climate within the organization, establishing a culture of integrity and ethical behaviour throughout the workforce.

Moreover, Stouten et al. (2013) argued that ethical leaders should use both negative and positive reinforcement and act as trustworthy role models based on this theory. Social learning theory suggests that rewards and punishments in the workplace assist employees in learning vicariously about what is right and wrong by observing their co-workers being held accountable for their conduct (Brown et al., 2022; Brown & Trevino, 2006). This, in turn, encourages followers to self-regulate and engage in prosocial and appropriate behaviour.

3. Methodology

In the present study, a comprehensive collection of 112 articles was identified, covering the period from 1977 to early 2022. Each paper underwent a meticulous screening process to ensure its relevance to the research objectives. To structure the literature, a thematic review technique was employed, in which the articles were organized based on the issues or subjects that align with the study's objectives. This approach facilitated a systematic examination of the literature, enabling the researcher to gain a holistic understanding of the field. Additionally, a systematic review and content analysis methodology were employed to review and analyze the selected articles. These rigorous methods allowed for a thorough examination of the research results, extracting valuable insights and identifying key patterns and trends within the literature.

First, to ensure the inclusion of influential and reputable sources, a purposeful/selective sampling approach was employed to select peer-reviewed journals that hold significant impact within the financial accounting academic community. The search for relevant articles was conducted utilizing academic publishing houses and databases that specialize in scientific journals including Springer, Wiley, The American Accounting Association, Emerald, Scopus, and EBSCO Host, as well as the Google Scholar publishing webpage. The selection process focused on journals that have conducted comprehensive content and empirical analyses specifically related to the areas of ethical leadership and earnings management. Moreover, particular attention was given to renowned, world-leading journals known for their high-quality publications. As a result, the following journals were chosen for this study: The Accounting Review (4.67 SJR in 2021), Journal of Accounting

and Economics (7.35 SJR in 2021), Accounting Horizons (1.45 SJR in 2021), Journal of Financial Economics (10.42 SJR in 2021), Journal of Accounting and Public Policy (1.09 SJR in 2021), Business Ethics Quarterly (1.54 SJR in 2021), Journal of Business Ethics (2.44 SJR in 2021), and The Leadership Quarterly (4.91 SJR in 2021), among others. The selection of these highly regarded journals ensures a robust foundation for conducting an in-depth analysis of the literature and obtaining reliable insights into the relationship between ethical leadership and earnings management.

Second, during the paper discovery process, multiple keywords were used to ensure the comprehensive inclusion of relevant literature. The chosen keywords included ethics, leadership, ethical leadership, earnings management, earnings manipulation, financial reporting quality, and ethical dilemmas. These specific keywords were selected to focus on articles that specifically discuss the intersection of ethics, leadership, and earnings management within the context of financial reporting. In addition to considering the titles of papers, the abstracts and associated keywords from each article were also taken into account. This broad approach aimed to encompass a wide range of studies that covered the desired research topics, allowing for a thorough analysis of the literature. By including these specific keywords and utilizing multiple elements of the papers, the current study guarantees a comprehensive examination of the literature and the selection of relevant articles that contribute to the understanding of ethical leadership and its implications for earnings management and financial reporting quality.

In the final phase of the study, a time frame was established, limiting the search to papers published between 1977 and 2022. This period ensured comprehensive coverage of relevant literature while considering the evolution of research on the chosen topics. A total of 247 papers were initially retrieved from the selected journals, marking the starting point for the investigation. To ensure a thorough analysis, the content of each paper was scrutinized in detail, resulting in a reduction to 112 articles that aligned most closely with the research objectives. However, it is important to note that access restrictions posed a limitation, leading to the exclusion of 23 articles from the final selection. This step aimed to maintain the integrity and comprehensiveness of the study while working within the available resources. To further refine the chosen articles, specific criteria were applied. The research had to primarily focus on the field of financial accounting, and the paper had to explicitly address the various aspects of financial reporting ethics.

The majority of the selected articles, comprising 82%, were published in peer-reviewed journals. These journals are known for their rigorous evaluation process and add credibility to the findings. It is worth noting that a significant proportion of the selected papers were published in world-leading journals, which further highlights their scholarly significance and the recognition they have received in the academic community. The data on journal rankings was obtained from the widely used Scientific Journal Rankings (SJR), which is a metric used to assess the influence and impact of scholarly journals. Relying on SJR rankings helps ensure that the chosen journals are prominent and of high quality, thus ensuring the inclusion of reputable sources in the study.

4. Results and Discussion

Numerous research studies identified concerns related to the financial reporting process, such as earnings manipulation. In light of this, ethical leadership has been recognized as a possible solution to address and prevent unethical behaviours. The following articles provide insights into this issue and also examine the potential link between ethical leadership and earnings management.

The most important figure in financial reports is earnings, which is shown as the bottom line in the profit or loss and other comprehensive income statements. Stakeholders relied heavily on earnings data to assess a company's performance (Rahman et al., 2023; Ronen, Yaari, 2008; Toumeh, 2023). However, the existence of accounting standards like IFRS or GAAP, with their principle-based approaches, provided executives with the discretion to interpret and implement these standards (Chen, Sheng, 2013; Dechow, Skinner, 2000; Gerged et al., 2021). In practice, this discretion created an opportunity for managers to manipulate reported earnings in order to meet their own objectives (Rahman, Chowdhury, 2020; Schipper, 1989).

Such manipulation of reported accruals by managers reflected their ability to use discretion within the accounting standards to modify earnings, potentially aiming to meet specific targets or objectives (Habib et al., 2022; Taylor et al., 2023). This practice raised concerns about the reliability and transparency of financial reporting, as the reported earnings may not accurately reflect the underlying economic performance of the company (Cheng et al., 2023; Huang et al., 2020). Researchers extensively studied these issues and their impact on financial reporting, providing insights into the complexities and potential consequences of earnings management practices (Roychowdhury, 2006; Wu, Zhou, 2022).

Earnings management became a global issue in financial reporting, with significant growth observed over the past two decades. Scholars from around the world demonstrated great interest in this phenomenon (Chen & Sheng, 2013). Corporate failures have revealed that a significant number of companies in the present day engage in manipulating their reported earnings. Previous studies focused on the ethical dilemmas that were present in high-profile collapses of corporations such as Arthur Anderson, Enron, HIH Insurance, Toshiba, WorldCom, and Tesco (e.g., Jiang, 2020; Monteiro et al., 2022; Toumeh et al., 2020). Following the numerous financial scandals that occurred over the past twenty years, there was a noteworthy focus on the ethics of financial reporting (Saleh et al., 2020; Mihelic et al., 2010; Nekhili et al., 2022). Trevino et al. (2003) and Mayer et al. (2010) highlighted that these scandals were triggered by a lack of personal qualities like integrity and honesty in leadership positions within institutions. For example, in the Enron scandal, the management fostered a culture of conflict of interest and unethical accounting practices, ultimately resulting in the company's downfall (Zhu et al., 2016; Ponnu, Tennakoon, 2009).

Goswami and Agrawal (2023) and Taylor and Pattie (2014) emphasized that the evaluation of managers based on their ability to meet analyst forecasts is a subject of ongoing debate. However, according to Trevino et al. (2000), the responsibilities of managers should extend beyond solely focusing on business aspects, such as outperforming competitors and meeting earnings targets. They argued that managers should also prioritize the

establishment of ethical standards within their organizations. Building on this perspective, Kul (2017) stressed the significant role of managers in fostering moral values among employees. They stated that managers bear the responsibility for implementing these values in their decision-making processes and leadership positions, ultimately creating an ethical culture within the organization.

Leadership involved using techniques to motivate and guide subordinates in achieving specific goals set by leaders (Abu Afifa, Nguyen, 2023; Andriani et al., 2018). In any organization, ethics play a significant role, especially in management and leadership (Yuan et al., 2023). Ethics are not limited to being a personal matter between an individual and their conscience. Therefore, leaders are expected to prioritize ethical considerations and take a central role in guiding their followers to adhere to these standards (Babalola et al., 2019; Mihelic et al., 2010). To effectively promote ethical principles throughout the organization, management can employ various strategies. One approach is the implementation of motivational programs based on ethical values (Brown et al., 2022; Fleischman et al., 2017). These programs serve as a means to spread the message of ethics across the organization, cultivating a culture where ethical behaviour is encouraged and maintained. Moreover, leaders actively advocate for ethics, setting the tone for ethical conduct and fostering a work culture where employees are motivated to align their actions with ethical standards. Their guidance and example play a crucial role in shaping the organization's ethical framework and upholding ethical values and principles.

An ethical perspective is a personal strategy that managers can use to avoid involvement in unethical behaviours (Cheng et al., 2023; Donegan et al., 2017). Mayer et al. (2012) noted that effective leaders can mitigate negative organizational outcomes, such as conflicts of interest and misconduct. According to Shin et al. (2015), ethical leadership is associated with positive outcomes, including increased employee commitment, engagement, and incentives. These positive outcomes, in turn, contribute to improved organizational performance. Additionally, Madanchian et al. (2018) found that ethical leadership is linked to greater leadership effectiveness. Taken together, these findings highlighted the importance of ethical leadership in creating a positive work environment, enhancing employee commitment and engagement, and ultimately driving organizational success.

Ethical leaders demonstrate to their subordinates that they value and reward doing the right thing. They serve as ethical role models, creating an ethical climate for employees and equipping them with the skills and procedures to handle ethical issues. For instance, ethical leaders instil in their followers the importance of upholding moral standards despite external pressures and striving to achieve business objectives impartially (Chen, 2010; Mayer et al., 2010). Additionally, ethical leaders emphasize the significance of ethical conduct by implementing ethical rules and procedures. They also promote the message that ethics are a crucial outcome of the organization, first by establishing ethical standards, then by adhering to these standards, and finally by rewarding ethical employees while disciplining those who violate ethical standards (Brown, Trevino, 2006; Yuan et al., 2023).

The connection between earnings management and ethical leadership reveals an important aspect of organizational behaviour. Earnings management refers to the deliberate manipulation of financial statements in order to achieve specific targets or deceive stakeholders, which can compromise the integrity of financial reporting. On the other hand,

ethical leadership encompasses principles and practices that prioritize moral values, transparency, and accountability in decision-making. Examining the relationship between these two subjects can offer insights into how ethical leadership can count. Additionally, studying the role of ethical leadership in promoting a culture of integrity and responsible financial reporting provides strategies that organizations can adopt to reduce the risks associated with earnings management and enhance stakeholder trust.

In the conducted content analysis, several ethical dilemmas were identified as influential factors in earnings management practices. These dilemmas included conflicts of interest, the pressure to meet financial targets, and the temptation to manipulate financial statements. It was clear that ethical leaders played a crucial role in guiding employees through these dilemmas by promoting ethical decision-making frameworks and providing guidance on ethical behaviour. The analysis highlighted the significance of organizational factors in shaping ethical leadership and its impact on earnings management. Factors such as organizational culture, ethical climate, and the presence of robust corporate governance mechanisms were found to enhance the effectiveness of ethical leadership in curbing unethical earnings management practices.

Finally, the current study revealed that ethical leadership acts as a protective mechanism against unethical earnings management. Organizations with ethical leaders demonstrated a reduced susceptibility to financial misconduct and fraudulent activities. Ethical leaders cultivated an environment of trust and transparency, discouraging unethical practices and fostering a strong ethical culture within the organization. These findings emphasized the importance of ethical leadership in mitigating unethical behaviours associated with earnings management. Ethical leaders served as role models and champions of integrity, creating an atmosphere where employees were motivated to uphold ethical principles. Ethical leaders played a crucial role in shaping the ethical climate of an organization. They established and reinforced ethical norms, which not only safeguarded against unethical earnings management practices, but also fostered a culture of ethical conduct throughout the entire organization.

5. Conclusion

The present research relied on secondary data gathered from published scientific articles available in the academic literature. The purpose of this approach was to systematically explore the phenomenon under investigation and propose an effective mechanism to address it. To structure the literature review, a thematic approach was adopted. This involved categorizing articles based on specific themes and topics that were relevant to the study objectives. Using this approach, a comprehensive understanding of the subject matter was achieved, and the review focused on key aspects relevant to the research topic. Subsequently, a content analysis was employed to thoroughly review and analyze the selected research papers. The content analysis process involved a systematic examination of the articles, including their titles, abstracts, methodologies, findings, and discussions. This approach allowed for the identification of common themes, emerging trends, and gaps in the existing literature. Following this rigorous approach, the research findings were made

reliable and valid, contributing to a deeper understanding of the phenomenon and providing a foundation for proposing effective mechanisms to address it.

Earnings management practices have a significant impact on the credibility of reported earnings. They can mask a company's true performance, distort the quality of earnings, and erode confidence in the financial statements. As a result, shareholders have lost trust in the accuracy of accounting information. This has prompted researchers to focus more on earnings quality. Previous empirical research has consistently shown that ethical leadership has a positive impact on curbing unethical behaviour and misconduct within organizations. Ethical leaders create an environment where the temptation to engage in manipulative financial reporting practices is reduced.

The current study highlights the importance of ethical leadership in promoting ethical conduct and reducing earnings management. This, in turn, enhances the quality of financial reporting and creates a more ethical climate within organizations. The findings from the content analysis shed light on how ethical leadership influences earnings management practices and financial reporting quality. These findings underscore the imperative for organizations to prioritize the advancement and endorsement of ethical leadership. By doing so, they can foster a climate of integrity, enhance financial reporting procedures, and mitigate the perils associated with unethical earnings manipulation. Ethical leadership has consistently shown its effectiveness in enhancing the overall performance of organizations. Based on these findings, the present study provides additional evidence supporting the idea that ethical leadership can effectively mitigate earnings management practices.

Drawing on an extensive literature review of earnings management and ethical leadership, this article suggests new perspectives to expand the understanding of these topics. Specifically, it focuses on identifying strategies beyond the traditional methodological or conceptual aspects to effectively mitigate earnings manipulation. However, it is important to acknowledge certain limitations. For example, this study proposes theoretically that ethical leadership can be an effective mechanism to minimise earnings manipulation practices. Therefore, future studies should empirically investigate the impact of ethical leadership on these practices. In addition, it is important to acknowledge that earnings management is a comprehensive and complex concept. Different forms of earnings management, such as real-based earnings management, may necessitate distinct approaches to effectively control them. As a result, future researchers could explore the influence of ethical leadership specifically on real earnings management.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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TRANSPORT AND LOGISTICS MARKET TRANSFORMATION: PROSPECTS FOR RUSSIAN-CHINESE INTEGRATION UNDER SANCTIONS RESTRICTIONS[3]

The development of the transport and logistics system in the direction of Russian-Chinese cross-border cooperation is an important direction not only from the point of view of economic prospects, but also from the point of view of political cooperation. The article is devoted to the development and substantiation of proposals for deepening the integration processes of the transport and logistics market of Russia and China. The trends in the development of the world market of transport and logistics services are analyzed with an emphasis on the border regions of Russia and China; identified its key problems and possible directions for their solution to deepen the subsequent integration between the border regions; an assessment of the effectiveness of the development of the transport infrastructure of the border regions of Russia, as well as the prospects for integrating Russia into the system of world economic relations in the Asia-Pacific region (APR) is given.
Keywords: Transport and logistics market; Transport; Logistics; cross-border cooperation; Integration processes; Sanctions; Russian-Chinese relations; The modern economy of Russia; Development of the Asia-Pacific market; Asian cooperation vector; China
JEL: R12; R41; L92; L98; O18; N75

Introduction

In the modern world, the topic of international cooperation between countries in the new conditions of tough political, economic and military confrontation acquires a special meaning. The Russian Federation, finding itself in a state of confrontation with the United States, is increasingly turning its interests to its Asian neighbours, primarily to China, the most powerful state in the Asia region. The trends of Russia's active integration into the Asian region are especially acute on the world development agenda today.

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This issue is of relevance in the dramatically changed geopolitical contexts associated with the announcement of economic sanctions and international legal restrictions by the United States and satellite states. The introduction of unprecedented sanctions regimes in 2022 disrupted the usual system of transport and logistics delivery chains and significantly hampered the transportation process for logistics operators. In fact, the supply of goods along the old routes turned out to be blocked, which caused a tendency to actively search for substitutes, as well as the development of new promising directions of export and import flows to meet the needs of the Russian national economy.

According to the most pessimistic forecasts, it can be assumed that in the event of a complete destabilization of partnerships with countries that commit unfriendly actions against the Russian Federation, the turn towards the Asia-Pacific region will be quite sharp and unambiguous. The deepening of cooperation will take place along several vectors at once: mutual integration (Russia-China) and Russia-EAEU-China. In the event of a negative scenario and a prolonged unstable situation on the world market, capacity building under the two models will be forced to occur faster than expected in the previously adopted strategic concepts of the Russian Federation. Thus, the events in Ukraine will become a kind of trigger for a complete change in the global geopolitical and geo-economic map of the world, and will also affect the deepening of partnerships between Russia and China.

One of the important directions in the implementation of the mutually beneficial interests of the two countries is the transport and logistics cooperation between Russia and China. Already this year, we are witnessing global changes in the geo-economic map of transport corridors and the logistics of commodity flows.

The transport and logistics industry plays a key role in building global economic relations with external trading agents in the world market. Interruptions in the operation of at least one link in the logistics chain cause a sharp change in world commodity flows and also reduce the commercial effect of the foreign trade transactions implementation. At the same time, transport and logistics are considered as two separate components, together give a synergistic effect and are integrated into the modern world economy processes of globalization and internationalization. Transport infrastructure is an important component of the life support of all economic sectors at the micro, macro and meso levels of the state, ensuring the security and the state integrity. To accompany such activities, there is logistics, as a link in international deliveries by optimizing the material and intangible flows that were "produced" by transport.

Materials and Methods

The analysis is based on the methods of socio-economic processes statistical research, comparative analysis of the economic processes' dynamics; historical approaches; dialectical method of optimal search for development of the transport and logistics market solutions in the regions; as well as forecasting methods that make it possible to give short-term and long-term forecasts for the development of the transport and logistics market in Russia and China. The general logical method of data synthesis was widely used in the work, which was obtained by combining historical, economic and social indicators. Based on the indicators,

the authors made a forecast on the possibility of an effective turn of the market of transport and logistics activities of Russia to Asia and also analyzed the problems that the domestic market may face with a closer merging of the Russian and Chinese markets. Of the theoretical methods, the historical one was widely used with a comprehensive analysis of the development of Russian-Chinese trade relations, especially in the railway transport market; a classification method that will allow you to systematize and structure the received heterogeneous information about the object of study. The empirical method in the work consisted of modelling new route routes between Russia and China, levelling transit zones and additional hub transport systems, as well as describing the main economic opportunities and technological characteristics that made it possible to implement a number of transport projects in the Russian-Chinese market of transport and logistics services.

Results and Discussion

Transport and Logistics Complex of the People's Republic of China: Modern Achievements

There are many definitions of transport and logistics (see, e.g. Afansiev, 1965; Prokofieva, Lopatkin, 2003; Vardomsky, 2015), but in this article, we will consider two components as a set – a transport-logistics complex. The transport-logistics complex, in our opinion, is a set of transport infrastructure facilities and business entities whose activities are aimed at moving, accompanying and marketing material and intangible flows that ensure the viability of sectors and branches of national economies with their possible subsequent integration into the system of world economic relations.

The formation of the Russian and Chinese markets of transport and logistics services took place in different ways and underwent a number of transformations. The phenomenon of rapid China's transport infrastructure development is a unique example of a competent policy and comprehensive economic decisions of the state. It gives impetus to the rapid development of one of the fundamental sectors of the world economic system (Nosova, 2013).

The transport industry development has had a huge impact on most sectors of the Chinese economy. In China, the importance of this factor came to be understood as early as the early 1990s. The reserves for the growth of rail traffic were completely exhausted, and the task of the government was aimed at the accelerated development of interconnections between the regions by land transport. The lack of centralized planning and uniform distribution of the infrastructure component led to the disproportion’s formation. Therefore, in the period of the planned economy, the main task was to increase the indicators of the volume of transportation of goods over the annual increase in the gross industrial product. By the middle of the 7th five-year plan, this indicator was achieved (Sazonov, Zaklyazminskaya, Wu Zi, Chen Xiao, 2017). As a result, the volume of cargo indicator began to exceed the transport and logistics capacity for transportation. Throughput in many directions was also limited. Such an imbalance arose due to an absolutely unprepared for such volumes and an undeveloped transport network. China has only 3% of the world's transport network with such a huge territory – it’s only 10 km of roads per 100 sq. km of territory (Avdokushin, 2019; Andronova, Sokolan, 2019).

The irrational use of the constructed railway networks, mainly for defence purposes, also led to an uneven infrastructure and freight flows distribution (to the west of the Beijing-Guangzhou railway). As a result, about 85% of newly built highways fell on these routes. There was a gap between the western and northeastern regions of China, where the railway service worked with overvoltage. This has led to an increase in the urban population in areas with better infrastructure. In addition, the tariff system in the country did not take into account the difference in cost on different route lines. Analyzing the transport Chinese railway complex infrastructure until the mid-90s, we can say that it did not have rational support and, as a result, it worked inefficiently (Abramov, 2018).

Due to the influx of investments through four channels: *state, credit, equity financing and through public-private partnerships*, large-scale construction of railways in China begins. China has become an innovator in the construction of railway networks as undersea highways since 2015 and has begun construction of the 269 km high-speed rail line (HSR) Hangzhou – Taizhou (Galeza, Chan, 2021). Today China's high-speed rail network occupies a leading position in the world and is the largest in terms of length – over 22 thousand km, which is 65% of the global length of high-speed highways by 2020 (Vinogradov, 2020).

The total length of high-speed lines should reach 38,000 km by 2025. Such colossal results were achieved thanks to the improvement of the logistics component quality on the railway network due to the constant inflow of investments from the above four sources: public and private. The multiplier effect of the work of the railway industry in China is associated not only with a competent investment policy, but also with the effect of capital productivity (Volgina, Pengfei, 2020). Thus, the number of people employed in the railway industry of China exceeds 2.2 million people, and the constant improvement of the technological component creates a demand for highly skilled labour. By 2045, the Chinese leadership is faced with the task of making China a world industrial power and the development of the railway industry can become the main economic driver (Sazonov, Syao, Zakliazminskaia, 2017).

A short history of the trade relations development between China and Russia (cross-border cooperation)

Russian-Chinese relations have a rich and complex history. Trade relations have roots in the heyday of overland trade between Asia and Europe along the Great Silk Road in the 2nd century BC, so the trade relationship between the two countries has a rich history.

Mutual integration began with the first Russian embassy to China in 1618, which marked the development of Russian-Chinese trade relations. At the same time, the first overland route was opened from Europe to China through Siberia and Mongolia. Later, in 1689, the Nerchinsk Treaty was signed - the first interstate document that established the border and procedure for trade between the two countries. Several important treaties followed Nerchinsky: the Kyakhta and Burinsky treaties in 1727.[4]

[4] The Nerchinsk Peace Treaty between the Tsardom of Russia and the Qing Empire, which for the first time determined relations and the border between the two states. Concluded on September 6, 1689, near

In June 1858, the strategically important Treaty of Tianjin was signed between E.V. Putyatin and the official representatives of the Qing dynasty, Gui Liang and Huashan.[5] According to this document, Russia received the right to trade both by land and by sea. In the 19th century, since 1864, a Russian diplomatic mission began to operate in Beijing. At this time, Emperor Alexander III and Finance Minister Sergei Witte were ardent supporters of the policy of rapprochement between Russia and China, and the active promotion of Russian policy in the Far East. Alexander III concluded an agreement on the settlement of border issues (1881), as a result of which the Kashgar province (western China, Xinjiang) was transferred to China. This decision deepened the policy of Russian-Chinese cooperation. In 1895 the first Russian-Chinese bank opened in St. Petersburg. In 1896 An agreement was signed for the construction of the Chinese Eastern Railway. The agreement also regulates the construction of the railway line "Chita (Russia) – Harbin (China) – Vladivostok (Russia)". The importance of this railroad is difficult to exaggerate (Maslov, 2020).

The 20th century was full of cataclysms and changes in relations between China and Russia, however, the transport and logistics complex, which required many years of serious investment, developed dynamically.

In the 1960s, the USSR entered into transcontinental transportation between Europe and Asia along the Trans-Siberian Railway with China's support. From the phase of "friendly relations" in 1992, Russian-Chinese cooperation was transformed into a "strategic partnership" in 1996.

In 2001, Russia and China signed the key Treaty of Good Neighborliness and Friendly Cooperation, which gave a modern dynamic impetus to the development of bilateral contacts, primarily in the field of trade, transport infrastructure and logistics.

The solid foundation of the contractual base, as well as the accumulated experience, currently make it possible to more intensively develop social and economic cooperation between Russia and China, especially in the border area. The countries have a long common extended border.[6] About 70 of the 85 subjects of Russia interact with the provinces of China. Cross-border cooperation is based on bilateral interest: on the part of Russia is the implementation

Nerchinsk. It was the result of the "Albazin War" – the siege by the Manchu army of the Russian fortress Albazin in 1685 and 1686.

Kyakhta Treaty on delimitation and trade between the Russian Empire and the Qing Empire. Prepared during the period of the embassy to China in the course of work on the Burinsky Treaty and signed on October 21, 1727 by the Russian ambassador S. L. Raguzinsky – Vladislavich and representatives of the government of the Qing Empire Chabina, Tegut and Tulishen. Confirmed the terms of the Nerchinsk and Burinsky treaties.

[5] Gui-liang and his state, chairman of the inspection chamber, divisional chief of the heavy army of the blue banner with a border, high dignitary Huashan. The aforementioned plenipotentiaries, on the basis of the authority given to them from their governments, agreed and decided the following articles: Article 1. This treatise confirms the peace and friendship that have existed between e.v. emperor of all Russia and e.v. Bogdokhan Daiqing and their subjects. Treaty of Tientsin 1858.

6 The current length is 4209.3 km, including 650.3 km of land, 3489.0 km of river and 70.0 km of lake. It breaks up into two sections: a long eastern and a short western (about 50 km). Between them lies Mongolia , bordered by Russia to the north and China to the south. The Russian-Chinese border has both river (passes along the fairway of the Argun, Amur and Ussuri rivers) and land sections.

of socio-economic programs for the development of Zabaikalsk and the Far East, and on the China part is border industrial regions revival of China (Portyakov, 2002).

On the eve of the 20th anniversary of the Treaty on Good Neighborliness, Treaty and Source between China and Russia, as well as the official visit of Xi Jinping, the General Communist Party of China and the unexpected People's Republic of China to Russia (as part of the first international visit after his re-election as president at the National People's Congress 2023), mutual articles were published in the media of the heads of state, which confirmed the intentions of the parties for friendship and long-term development of cooperation. "The successful holding of 8 thematic cross years brings friendship and cooperation to new heights. (Chinese President Xi Jinping (author's article for the Russian media) "Rossiyskaya Gazeta", 2023).

In turn, Vladimir Putin noted the following: "We met Comrade Xi Jinping in March 2010, when he came to Moscow at the head of a representative Chinese delegation. Our first meeting was very businesslike and at the same time sincere and friendly. This style of communication personally impresses me deeply. I know that China attaches great importance to friendship and human relationships. It is no coincidence that the sage Confucius said: "Isn't it a joy when a friend comes from afar!" We in Russia also highly appreciate these qualities, for us a true friend is like a brother. In this, our peoples are very similar." (Vladimir Putin's article in the People's Daily "Russia and China – a partnership looking to the future", 2023).

Thus, it can be summarized that China and Russia adhere to the concept of eternal friendship and cooperation. Bilateral relations are based on the principles of non-alignment, non-confrontation and non-direction against third parties. The two countries firmly support each other in following the path of development according to national realities, in the implementation of development and revival.

Cross-border Russian-Chinese cooperation

Historically, the development of these regions has been a key base for conjugating various Russian-Chinese initiatives, primarily cross-border cooperation. The accumulated historical experience of Russian-Chinese cooperation predetermined the interaction between the two countries and the creation of a single transport and logistics network for moving a wide range of goods and services. There is a constant demand for certain types of goods, such as consumer goods, agricultural products and natural resources. In addition to import-export trade and economic relations, cross-border cooperation is one of the factors in the development of small and medium-sized businesses. Of the 15 existing border economic cooperation zones in China, four are oriented towards Russia: Manchuria, Suifenhe, Hongchun and Heihe (Zhang, Hoekstra, 2020).

Mutual trade between Russia and China is growing rapidly. In 2021, mutual trade indicators reached a maximum compared to 2020 and amounted to $146.88 billion, which is 35.8% more than the base year.[7] China is Russia's largest partner in both exports and imports. According to the Federal Customs Service of the Russian Federation, China's share in foreign

[7] Official website of the Federal Customs Service https://customs.gov.ru/folder/511.

trade turnover amounted to 18% in 2021, which is the leading indicator among other partners. According to the General Administration of Customs of China, exports to Russia in 2021 increased by 33.8%, to $67.56 billion, and imports to China by 37.5%, which amounted to $79.32 billion. In 2022, trade between Russia and China increased by 29.3% in annual terms. At the end of the year, the indicator amounted to a record $190.27 billion, news agencies reported, citing data from the General Administration of Customs of the People's Republic of China.

Imports from Russia to China amounted to $114.15 billion, which is 43.4% more than in 2021. Exports from China to Russia grew by 12.8% to $76.12. Russia's positive balance almost tripled to $38 billion (Khvostik, 2023).

Export-import operations of Russia and China today

Let's take a closer look at the commodity structure between Russia and China in 2021 (Table 1 and Table 2).

Table 1. The volume of foreign trade of the Russian Federation with China, billion dollars

Indicator	2017	2018	2019	2020	2021
Import	48	52,2	54,1	54,9	**72,7**
Export	38,9	56,1	56,8	49,1	**68**
Trade turnover	86,9	108,3	110,9	104	**140,7**

Source: Review of the foreign trade of the Russian Federation with China for August 10.22, prepared by the Tinkoff journal https://journal.tinkoff.ru/china-partnership/ based on official statistics of the Federal Customs Service https://customs.gov.ru/folder/511.

As can be seen from the dynamics, the indicators are steadily increasing. The main increase in the total trade turnover was provided by oil: in May, the Russian Federation came out on top in terms of its supplies to the PRC. Such dynamics are explained by large discounts for Chinese buyers. State-owned companies Sinopec and Zhenhua Oil purchased oil at a discount.

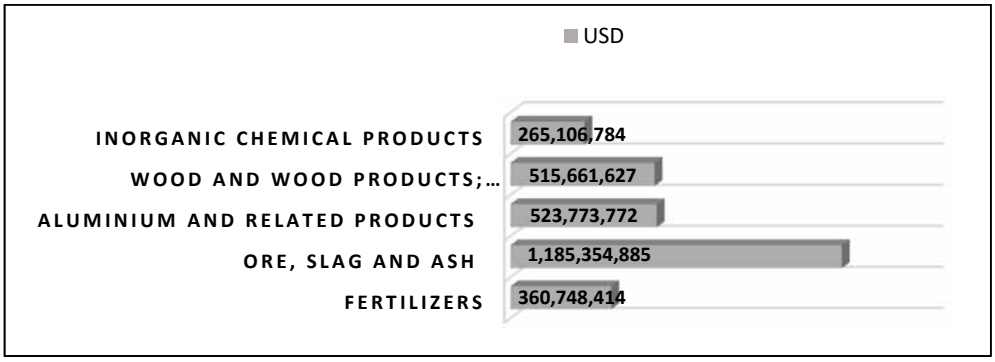
The following product groups accounted for the largest increase in Russian exports to China in 2021 compared to the base year 2020 (Figure 1).

Table 2. Structure of Russian-Chinese Commodity Trade in 2021

Product	% of total Russian exports to China	% in 2020
Mineral products	74.37	65.45
Wood and pulp and paper products	7.62	8.75
Metals and products from them	5.74	6.07
Food products and agricultural raw materials	4.98	8.07
Products of the chemical industry	3.69	3.83
Machinery, equipment and vehicles	3.44	4.60

Source: Review of the foreign trade of the Russian Federation with China for February 12, 2022, prepared by the Russian Foreign Trade website based on data from the Federal Customs Service of Russia https://russian-trade.com/reports-and-reviews/2022-02/torgovlya-mezhdu-rossiey-i-kitaem-v-2021-g/ and Official website of the Federal Customs Service https://customs.gov.ru/folder/511.

Figure 1. Commodity export structure of the Russian Federation to China in 2021



Source: Review of the foreign trade of the Russian Federation with China for February 12, 2022, prepared by the Russian Foreign Trade website based on data from the Federal Customs Service of Russia https://russian-trade.com/reports-and-reviews/2022-02/torgovlya-mezhdu-rossiey-i-kitaem-v-2021-g/.

At the same time, a stunning growth is observed in fuel and mineral products, oil and products of their distillation; bituminous substances – an increase of $16,664,536,781.

Table 3. Export structure of Russia to China in 2021

Product	% of total Russian exports to China per year	% in 2020
Machinery, equipment and vehicles	60.77	59.03
Products of the chemical industry	11.03	10.66
Textiles and footwear	9.19	11.32
Metals and products from them	7.44	7.09
Food products and agricultural raw materials	1.99	2.53

Source: Review of the foreign trade of the Russian Federation with China for February 12, 2022, prepared by the Russian Foreign Trade website based on data from the Federal Customs Service of Russia https://russian-trade.com/reports-and-reviews/2022-02/torgovlya-mezhdu-rossiey-i-kitaem-v-2021-g/.

As we can see from the presented data, Russian exports to China are of a pronounced raw material nature, while imports are dominated by high-value-added products. The largest growth in imports was recorded for the following groups of goods: nuclear reactors, boilers, equipment and mechanical devices; electrical machines and equipment, their parts; sound recording and reproducing equipment, equipment for recording and reproducing television images and sound; means of ground transport; plastics; furniture; bedding, mattresses; prefabricated building structures; shoes, leggings and similar articles; organic chemical compounds (Volgina, Liu Pengfei, 2020).

Over the past few years, cooperation between China and the Russian Far East has been actively developing in the fields of energy, sea routes, industry, agriculture, forestry, and the digital economy. Already, projects are being developed to expand the infrastructure between the two states, which will contribute to the logistics activity development and the transport infrastructure expansion. Countries are also increasing mutual settlements in national currencies. So, in 2021, 25% of mutual settlements on foreign trade operations were made in

rubles and yuan, by the end of 2022 this share will increase due to the mutual agreement reached between the countries.

Thanks to joint efforts, trade turnover in 2022 amounted to a record $190 billion and increased by 116 percent compared to 10 years ago. Interaction in such new industries as scientific and technological innovation and cross-border e-commerce maintains high dynamics. Interregional cooperation is rapidly gaining momentum. All this not only brings real benefits to ordinary people, but also gives an inexhaustible impetus to the development of both countries (Chinese President Xi Jinping (author's article for the Russian media), 2023).

Table 4. The main indicators of the trade turnover of the Far Eastern and Siberian Federal Districts in 2019-2021 by country

Indicator for the period March, 2019 – March, 2021	Far Eastern Federal District	Siberian Federal District
Trade turnover	**$71.1 billion**	**$88.2 billion**
Main turnover	"Mineral products" (47%) "Jewels" (11%)	"Mineral products" (37%) "Metals and products from them" (23%)
In the structure of trade turnover by countries	China ranks first (32%), South Korea ranks second (24%)	in first place is China (21%), in second place is the Netherlands (8%)
Export	**$53.9 billion**	**$68.4 billion**
Mainly exported	"Mineral products" (60%), "Jewellery" (14)	"Mineral products" (47%), "Metals and products from them" (27%)
In the structure of exports by countries	in first place is South Korea (31%), in second place is China (26%)	in first place is China (21%), in second place is the Netherlands (10%)
Import	**$17.2 billion**	**$19.8 billion**
Mostly imported	"Machinery, Equipment and Apparatus" (36%), "Transport" (17%)	"Machinery, Equipment and Apparatus" (23%), "Chemical Industry Products" (22%)
In the structure of imports by countries	China ranks first (48%), Japan ranks second (14%)	in first place is China (22%), in second place is the United States (11%)

Source: compiled by the authors based on data from the websites of the Governments of the indicated regions Official website of the Plenipotentiary Representative of the President of Russia in the Siberian Federal District and the Far Eastern Federal District http://www.dfo.gov.ru/district/

Considering the direct communication between Russia and China, it is important to note the main border areas. Due to the geographical position of the Russian-Chinese border: the Chinese province of Heilongjiang borders on the Primorsky and Khabarovsk Territories, the Amur Region and the Jewish Autonomous Region. Primorsky Krai borders the territory of the Chinese province of Jilin, and the territory of the Trans-Baikal Territory is adjacent to the territory of the Autonomous Region – Inner Mongolia, where 50% of the shares of the Mongolian Railway belong to the Russian side since the time of the Kyakhta Treaty between China, Russia and Mongolia (Luzyanin, 2016).

Further development of cross-border cooperation will depend on the socio-economic development of Russia as a whole and Far Eastern regions' development, which will undoubtedly require an efficient transport system (see Made in China 2025). Transport communications unite the Far East and the Baikal region with other country regions, which is a necessary condition for the territorial integrity and economic space unity of Russia. The

most important Euro-Asian transport corridors pass through this territory – is the Trans-Siberian Railway, Primorye-1, Primorye-2, the Northern Sea Route, as well as other transport communications linking Russia with the countries of the Asia-Pacific region.

Table 5. Foreign trade of the Russian Federation by main countries and groups of countries (million US dollars)

	January – January 2021			Share in turnover, %	January – January 2022			Share in turnover, %	RATES OF GROWTH, %		
	Turnover	Export	Import		Turnover	Export	Import		Turnover	Export	Import
The whole world	43813.4	26979.5	16834.0	100.0	69167.3	45842.6	23324.6	100.0	157.9	169.9	138.6
EU	15174.2	10520.0	4654.3	34.6	26891.3	21062.4	5828.9	38.9	177.2	200.2	125.2
APEC	15564.7	7308.0	8256.8	35.5	23218.1	10841.7	12376.4	33.6	149.2	148.4	149.9
China	8697.6	4321.6	4376.0	19.9	13009.4	5804.6	7204.9	18.8	149.6	134.3	164.6
CIS	5352.8	3559.9	1792.9	12.2	6677.9	4531.8	2146.1	9.7	124.8	127.3	119.7
EAEU	4036.6	2636.6	1400.0	9.2	4463.7	2970.0	1493.7	6.5	110.6	112.6	106.7
Other	3316.4	2446.5	869.9	7.6	4177.6	2999.2	1178.4	6.0	126.0	122.6	135.5

Source: Review of the Foreign trade of the Russian Federation by main countries and groups of countries based on the Official website of the Federal Customs Service https://customs.gov.ru/folder/511.

Compared to other territories of Russia, the transport infrastructure of the Far East and the Baikal region is poorly developed. Thus, the density of railways in this territory is 3.6 times lower than the average for Russia, and there are no railways in the Chukotka Autonomous Okrug, Kamchatka Territory and Magadan Region. The main transport arteries of the Far East and the Baikal region – the Trans-Siberian and Baikal-Amur Mainlines – require strengthening, since after 2010 up to 90 percent of their directions worked with a critical load level, primarily on the approaches to ports, large industrial areas and new deposits.

The rapid recovery of trade between the Russian Federation and China indicates the sustainability of trade and economic ties between the two countries. In 2024, the volume of trade between the Russian Federation and China is expected to increase by more than 37%

to more than USD 200 billion, followed by its growth by 2026-2027. up to 280 billion (Calculation of FANU "Vostokgosplan" according to the data of the General Administration of Customs of the People's Republic of China, 2022). Thus, according to the Federal Statistics Service of Russia, China has become the main economic partner. The rest of the increase is in the regions: India, United Arab Emirates, Turkey, South Korea, Syria, Nicaragua, Brazil and Israel.

Prospects for the development of the transport and logistics complex in Russia in the context of new Chinese initiatives

As already noted, for the implementation of the Chinese plan, the development of the Europe-APR-Europe directions is of greater interest. One such project is the Economic Belt of the Silk Road (SREB), which consists of creating a network of its own railway corridors along the route of the Asia-Pacific countries-European countries. Access to regions with high transit potential becomes, on the one hand, a link between European and Asian markets, on the other hand, a source for the subsequent exploitation of natural resources at preferential prices, and thirdly, one of the instruments of regional security and a geostrategic factor for expanding the Chinese employment market. The main task is to connect the Xinjiang Uygur region with Western Europe (Belova, Egorycheva, 2020).

To further develop the railway network, China has adopted a strategic plan for the development of the national transport complex for 2021-2035 (Borokh, Lomanov, 2020). The plan identifies five priority goals, including the introduction of innovative systems, strengthening the integration of railways with other modes of transport, improving the quality of services, respect for the environment and international expansion (Murphy, 2021).

Five implementation mechanisms have been developed to implement the plan.

1. *To stimulate the innovation system* by reforming the rail transportation industry with the expansion of Internet + and Internet of Things +, 5G and BB technologies. It is also necessary to create connecting lines to ensure a unified system of work on a multimodal route (Ostrovsky, Afonaseva, Kamennov, 2019), (Qin, Qi, 2022; Pereira, HMF; Saes, MSM, 2022).
2. *Infrastructure is needed,* including multimodal terminals and storage facilities. In addition to the infrastructure component, the logistics of the flow of goods should be built to optimize the transport process and mobile route adjustment. To improve the quality of rail services, is it necessary to create a system of high-speed rail routes, as well as develop a system of refrigerated freight transportation, prolonging the range of the transportation process, thereby increasing the interconnection between the city and the countryside? (Xin, Zheng, Zhou, Han, Tadikamalla, Fan, 2022; Alichleh AL-Ali, ASM; Sisodia, Gupta, Venugopalan, 2022; Ma, Cao, Li, 2021).
3. *Improving the safety and environmental friendliness* of rail transportation and standardizing the transportation process will also be an important condition for competitiveness. Ensuring the above criteria will affect the quality of the service market

in China through the use of comprehensive measures to support the industry (Zha, Yang, Wang, Wang, Zhou, 2020; Pan, Xie, Feng, 2020).

According to the new strategic plan, China's high-speed rail network is expected to reach 70,000 km by 2035 (see, The 2020 SIA Factbook). To a large extent, the main concentration of the development of such routes will be the Jingjinji area near the Yangtze River Delta, the Chongqing-Chengdu agglomeration (Orange Wang, 2021).

4. *Full digitalization.* To date, the digital economy covers a third of the sectors of China's GDP and provides an annual growth in employment. If in 2017 at the 19th Congress of the CPC, China's digital economy was only mentioned in Xi Jinping's speech in the annual report of the Chinese government as one of the most vibrant promising development areas that will accelerate the growth of China's economic performance. Already today, China occupies a leading position in the world rankings in terms of the level of development of the digital economy and is one of the most promising countries for further building up digital capacities (Pratap, 2022; Li, Yao, Yan, 2021; Deshpande, Varghese, Kale, Atre, 2021).

In a few years, China has been able to increase human resources and digital competencies, increase entrepreneurial and innovative activity, increase consumer demand in the high-tech sector, gain access to international capital through the VIE tool, transfer most of the services to the digital automated market, transfer the transport document flow to digital "rails", create a precedent for trade transactions for mutual settlements using our own payment system UnionPay, WeChat pay (Ajay Bhalla, Bhaskar Chakravorty, Ravi Shankar Chaturvedi, 2020).

In 2019, the Chinese government work report noted that expanding research and development ties in the fields of big data, artificial intelligence, next-generation information technology, high-tech equipment, biomedicine and new sources will be key areas for the Chinese economy in the next ten years. The lightning-fast development of China's digitalization is associated with China's regionalization in this area. For example, the level of GDP of Guangdong province is equal to the GDP of the whole of Russia, while the indicator of the volume of the digital economy of Guangdong is 4 trillion yuan, which is 10 times more than in the Russian Federation (Tiorkina, 2019; Ding, D., 2020).

Digitalization trends are especially noticeable in transport and logistics projects and affect several adjacent regions at once. The fact is that the period of the pandemic gave all countries a new look at the problems that may arise and paralyze the transport industry as a whole. In order to increase supply and automate logistics processes, which will be more resilient to external factors, China is issuing a special directive in 2021, which covers comprehensive measures to further develop the economy through digital transformation. According to the directive, the introduction of artificial intelligence, including in the transport industry, will allow several times to increase the performance of the Chinese economy in the near future. The Digital Silk Road project (hereinafter referred to as DSR) together with the border regions of the EAEU countries.

The CSP initiative was proposed back in 2015. However, at that time the EAEU countries were not ready to transform the management system through Internet technology, fearing

China's excessive dominance in this market. Today, the prospect of development has become the most realistic and, moreover, highly demanded by Russia. Global trends dictate a deeper study of integration processes between the EAEU countries and China with a significant reorientation of trade relations towards a mutually beneficial market. In the context of the complication of payments between Russia and EU countries, a new window of opportunity is opening for the development of electronic commerce using Chinese payment systems. This system will also be aimed at protecting a single cyberspace, which is a very relevant solution given the current unstable world market conditions (Tian, Zhang, Chi, Cheng, 2021).

For China, the development of this trend is a strategically important direction that will create the hegemony of the technological market in the Eurasian space. Already today, such giants as "Alibaba", "Tencent" and "Huawei" are becoming the most popular marketplaces. Taking into account the geopolitical situation, the turn to the Asian market will be made automatically, which will allow China to take a confident leading position (Varas, Varadarajan, and others, 2021).

The CSP concept is linked to several Chinese programs "Made in China – 2025" and "Chinese Standard – 2035" to provide a full cycle from production to marketing and bringing goods and services to the end consumer. Thus, the projects will intertwine initiatives for digital, technological, production and logistics transformation, which will present a closed system for profiting by the Chinese market and will minimize dependence on the countries of the Western bloc. The pandemic crisis has made the Chinese government aware of the importance of automated and robotic processes (Gao, Cao, 2020).

A number of strategic documents have also appeared in Russia, which are aimed at the rapid socio-economic transformation of the country's transport and logistics complex, including border regions.

Among the main programs: Program for the Development of the Digital Economy in the Russian Federation. until 2035; Transport Strategy of the Russian Federation until 2030 with a forecast for the period up to 2035; Strategies for the development of the customs service until 2030; Spatial development strategy of the Russian Federation for the period up to 2025. National strategies and programs are supplemented by similar documents of regional development: these are strategies and programs for the socio-economic development of the Far East and the Baikal region for the period up to 2025 and up to 2035; development of Siberia until 2030 and dozens of other programs that define the time frame and resources for creating a base for growth (Wu, Jiang, Liu, Wu, Liu, 2020). The most difficult thing for those grandiose tasks that are developed in our national and regional documents is their implementation in practice in the face of unprecedented US pressure on all countries of the world, six packages of sanctions from the EU countries and the US against Russia. However, we do not foresee any other way but to survive and develop relying on our own strengths. As for the transport and logistics sector in Siberia and the Far East, its modernization fits into both the interests of China and the interests of Russia. Ahead of us is a rapid transformation led by the Chinese locomotive.

Short-term and long-term forecasts of interaction between Russia and China

The joint statement signed by both parties on the plan for the development of key areas of economic cooperation until 2030 gives the green light to the development and activation of new systems and mechanisms for trade interaction at the international level. Emphasis will be placed on increasing trade in goods related to energy resources and products of the electrical industry. The declared readiness to strengthen and develop the existing model of trade relations creates a very favourable background for launching processes to improve the transport and logistics sector.

1. Short-term forecasts

- gradual improvement of international cargo delivery schemes;
- development of the regulatory framework for the elimination of customs formalities;
- transition to the Russian-Chinese document flow;
- formation of the unity of the information platform for combining and processing data on export and import licenses issued by the relevant authorities of Russia and China, certificates of conformity and other permits in the field of foreign economic activity;
- changing logistics chains and increasing routes through the Asian regions of Russia;
- unification of tariffs;
- increase in throughput;
- the emergence of new logistics and transport companies;
- creation of new border crossings on the border between Russia and China;
- revitalization of the economy of the border regions of Russia and China;
- deepening the diversification of suppliers of raw materials and goods between Russia and China;
- strengthening the Russia-China economic bloc, as well as strategic initiatives within the framework of BRICS and SCO.

2. Long-term forecasts

- formation of a reliable potential for strengthening economies;
- development of trade and economic cooperation and growth of mutual trade;
- well-established system of international trade relations;
- formation of a common transport and logistics market with unified technical and technological approaches, as well as a standardized management model;
- changing the structure of the Russian commodity market;
- shift of trade turnover to land modes of transport;

- increasing the role of railway transport and developing the infrastructure of this type of transport;
- creation of multimodal hubs in the border regions of Russia and China;
- cross-development of border regions and raising the level of Russian-Chinese cooperation;
- strengthening trade cooperation with third countries with Iran, Pakistan, India, the states of the Persian Gulf and Central Asia;
- the prospect of the emergence of new international coalitions, which may include the participation of such regional leaders as Saudi Arabia, Turkey, Iran and India;
- strengthening of the Asian-centric market model;
- development of the policy of mutual settlements in national currencies;
- replacement of Western investments, equipment, and technologies;
- development of new route routes between Russia and China.

Thus, it is possible to predict the deepening of mutual transport and logistics direct routes Russia-China-Russia. To date, several bilateral projects have already been launched, which predicts the expansion of the bilateral geography of services:

- in 2022, the first train went on a new logistics rail route from the Bayan-Nur district in northern China to Moscow
- in 2022, the Fesco group, in addition to the Far Eastern ports and border crossings, added an ocean route (deep sea) – through the Black Sea and the Suez Canal
- Now the FESCO Asia Landborder Train service transports goods from the Chinese cities of Tianjin, Qingdao, Shanghai, Xiamen and Guangzhou to Moscow and St. Petersburg through the Naushki, Dostyk, Altynkol and Zabaikalsk border crossings. Transit time is reduced from 15 to 25 days and depends on the direction
- in 2023, Mongolia began construction of a 745 km transit corridor that will connect Novosibirsk and China, which will connect the Tsagaannuur and Dayan border crossings
- in 2022, traffic was launched on a road bridge across the Amur River between Blagoveshchensk and Chinese Heihe
- active construction of the Europe-Western China transport corridor with the development of the M12 highway.

Conclusion

1. We believe that Russia and China have a close historical and geographical proximity, as well as the similarity of the ideological model of state development (the key role of the state), which determines the proximity of the positions of basic economic and political decisions at the international level, as well as mutual understanding in intercountry relations. In the new conditions of global changes in international relations and the

shifting of the balance of power to the East, it is necessary and possible for Russia to turn to the Asia-Pacific region markets.

The historical memory of unified ideological approaches has been preserved both in Russia and in China, despite many unsuccessful attempts to "rebuild" socialism after the collapse of the USSR. Russia began to actively change the vector of development and switched to capitalist modernization, while China began to carry out modernization based on a mixed socialist and capitalist basis.

Both Russians and Chinese revered Lenin and Marx, believed in a brighter future, in equality and brotherhood. The modern part of the population, which makes up the working class, as well as key figures holding the post of state managers in Russia and China, read the same books and watched the same cartoons and movies. In both countries, during the years of building socialism, an industrial base was created, which is still used today. Our cultures are aware of the common slogans about peace, work and brotherhood. Although both countries are now moving in the direction of the West, this common communist past still makes the alliance of Russia and China understandable to most of the population.

An important role in Russian-Chinese relations is played by the role of leaders of the countries of Russian President Vladimir Putin and Chinese President Xi Jinping, as well as their interaction. The mentality of the Russian and Chinese people is being built, and models of trust in the course chosen by the leader of the state. The course towards rapprochement was clearly marked by Mr Xi, who, as part of his first foreign visit after being re-elected, chose Russia, despite the decision taken the day before by the International Criminal Court in The Hague to issue a warrant for the arrest of Russian President Vladimir Putin.

It seems to us that the Asia-Pacific region will gradually strengthen economic institutions in the ideological logic of the main hegemon – China. In the emerging new realities for Russia of unprecedented sanctions pressure from the US and the EU, integration between Russia and China can become rapid and effective with a competent digitalization policy, Russia's basic economic sectors development and cross-border regions based on the experience of the Chinese model.

Thus, the trend towards strengthening the position of the hegemon in the face of China is no longer a new one. On the sidelines of the annual ASEAN summit on November 15, 2020, the signing of the Regional Comprehensive Economic Partnership was a clear signal to lay the foundation for a new world order in which China will play a key role

2. Improving the transport and logistics efficiency complex of the Russian regions will contribute to the deepening of integration processes between the border regions of Russia and China. At the same time, the complex modernization will lead to economic growth not only in the transport system, but also a multiplier effect for other economic sectors of the cross-border regions. Our study convincingly shows that in recent years, the rapid modernization of the transport and logistics complex in China has brought a new impetus to the development of the border regions and made the regional structure more uniform for the Chinese economy.

In the statement on economic cooperation and deepening partnership between the Russian Federation and China dated March 21, 2023, one of the main points was the improvement of

logistics for the development of bilateral trade, as well as the growth in the scale and optimization of the structure of trade through electronic and innovative tools. Thus, we should expect the development of project initiatives in this direction. Thus, it is planned that by 2025 repair work will be completed at the Naushki, Pogranichny, Makhalino and Zabaikalsk checkpoints. According to preliminary estimates of the Ministry of Transport of Russia, by 2026 the capacity of automobile border crossings will increase by 4,400 trucks per day (or 1.62 million per year), as well as by 44 freight trains per day (or almost 16,000 trains per year).

3. We consider the main directions for the transport and logistics complex development in Russia: automation of transportation processes, expansion of the transport and infrastructure network on railway lines in the border regions, auxiliary infrastructure expansion (warehouses, border crossings, transportation and transhipment points, terminals); investments growth in digital technologies in the railway complex; containers modernization; e-commerce system growth, express delivery; Russia's internal transport infrastructure development due to the growth of domestic consumer demand, and others. The result in the short term will be an increase in import flows and demand for "made in China" goods; the transport and logistics complex demand for ecological systems; entire market modernization of transport and logistics services; implementation of synergistic initiatives of Russia and China in the long term.

4. We refer to the key problems of real cooperation in the transport and logistics sector: imbalance in the development of the Russian and Chinese economies; technological left border Russian regions; lack of a quality infrastructure component; a sharp increase in the cost of transportation due to unstable market conditions; strengthening the economic "blockade" through sanctions leverage; rising debt of developing countries; lack of carrying capacity; growing shortage of skilled labour.

5. In modern conditions, it is necessary to develop multimodal types of freight transport. Due to the actual blocking of Russian ports in the northwest (St. Petersburg and Ust-Luga), export and import cargo flows actively moved to the Far East. The relationship between the Far Eastern regions of Russia and the border regions of China has sharply deepened. After the departure of international shipping companies, Russian Fesco and Sinokor became the main carriers of goods in the Far East. In addition, the vacated niche is being actively filled by Chinese companies, among which there are many "newcomers": SITC, Zhonggu, Heung-A Line, OVR Shipping, Gang Tong and Huaxin.

From Vladivostok, cargo is sent by rail to Moscow and St. Petersburg. As a result, the load on the Trans-Siberian Railway has increased, and its infrastructure capabilities are limited, especially since a lot of cargo from China to the Russian Federation and Europe goes directly, including as part of accelerated container trains. Trying to redistribute cargo flows, logistics companies add vehicles to the chain. For example, people are transported to Zabaikalsk by car, and then by rail. A new delivery route through Blagoveshchensk has appeared: cargo is delivered to the port of Dalian from China by sea, then transported by road to the border in Heihe, then by rail to Moscow, or transported through the Blagoveshchensky Bridge by car from Russia and then by rail to China. The transit time of the route is 30-35 days.

The following logistics problems in Russia slow down the development of transport logistics:

- deterioration and obsolescence of vehicles;
- deterioration of transport infrastructure – roads, loading terminals;
- low performance – both due to the qualifications of the workers themselves, and due to poor management (low wages, lack of control and incentives);
- incorrect construction of delivery routes;
- legal processes of mutual settlement of the rules of trade processes;
- low level of coordination between the links of the transport chain.

In connection with the departure of global lines from the ports of the North-West, the main routes of transportation from China to Russia now go through land border crossings and ports of the Far East. The load on the infrastructure on these routes remains extremely high.

The market lacks additional transshipment terminals at the border, since the existing border crossings Erlian / Zamyn Uud, Manchuria / Zabaikalsk, Khorgos / Altynkol and Alashankou / Dostyk during peak periods cannot cope with the flow of goods from China towards Russia, Europe and Central Asia. Also, the arrival of larger sea lines to the ports of the Far East could contribute to a change in the market situation for the better.

China remains the main direction of Russian imports, the importance of which in the current environment is only growing. At present, one of the most promising projects is the development of the infrastructure of the Northern Sea Route, which allows the PRC to optimize the supply of goods to other regions of the world. The growth of cargo transportation will also be facilitated by an increase in the capacity of the Trans-Siberian and Baikal-Amur railways and the reconstruction of automobile border crossings on the border with China.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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THE GREEN TRANSITION OF SMALL AND MEDIUM BUSINESS IN BULGARIA – CURRENT OVERVIEW AND OUTLOOKS[4]

The conscious need of transition to an environmentally friendly way of society life on a global scale in recent years outlines a new direction in the development and activity of humanity. A number of documents at the global and European levels are a clear sign of countries' determination t change significantly their attitude to the natural resources use in order to limit climate change and global warming of the planet, to ensure an environmentally friendly way of life and activity and the long-term preservation and well-being of human civilization. Small and medium-sized businesses in Bulgaria are a huge potential resource that can be a powerful engine for realizing the ecological transformation of the country's economy.

Current progress, financial ability and access to financial resources as well as the outlooks of small and medium companies in Bulgaria in the green transition are analyzed in this study. SMEs are classified in 3 clusters in terms of their progress in the transition process using TwoStep Cluster analysis with a set of indicators identified by authors. It has been established that despite the existing difficulties and the great inertia in the process of transition to an ecological economy of small and medium-sized companies in particular, more or less sustainable steps leading to the reduction of carbon emissions are observed, in the production of cleaner energy as well as elements of circularity in production processes and consumption. The transition appears to be taking place more quickly in medium-sized companies operating in manufacturing, logistics and transport, while small, mostly family-owned, companies with businesses in retail or service are progressing more slowly in this process. All the companies need of more serious and adequate support in the way of ecologization both by state regulations that to be applied clearly and transparently and by adequate financing

Keywords: green transition; ecologization; small and medium-sized companies funding
JEL: O13; O14; O16; Q01; Q42; Q50; Q56

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1. Introduction

The conscious need of transition to an environmentally friendly way of society life on a global scale in recent years, imposed as a result of unfavourable climate changes and irresponsible exploitation of the environment, outlines a new direction in the development and activity of humanity. The unscrupulous use of natural resources and the intense pollution of the environment as a result of human activity in recent decades have caused increasingly negative effects on the climate and ecosystems, both on a global scale and in the countries themselves and in Bulgaria in particular. A number of documents at the global and European level, starting with the United Nations Framework Convention on Climate Change, signed in 1992 and updated with the Paris Agreement, which entered into force in 2016, are a clear sign of countries' determination t change significantly their attitude to the natural resources use in order to limit climate change and global warming of the planet, to ensure an environmentally friendly way of life and activity and the long-term preservation and well-being of human civilization. Climate objectives remain at the heart of EU programs and policies, which is reflected in the EU-27 Multiannual Financial Framework (2021-2027), where 37% of recovery plan spending is dedicated to their implementation, as and in the specific actions of Member States.

Our country is no exception to the current global processes of ecologization, the main part of which is aimed at changing the economic model of societies, including sparing use of natural resources, production of clean "green" energy, priority development of energy-saving productions, secondary consumption and extending the life of manufactured goods. The green transition and the transition to a circular economy model are at the heart of this change. A number of policies and measures regarding climate and environmental protection and the transition of the economy to ecological foundations have been prioritized in the recovery and development plan of the country. For actual implementation of the policies and measures set, however, active political and legislative decisions and actions, specific programs and business strategies are needed to lead to the expected effective results.

Small and medium-sized businesses in our country are a huge potential resource that can be a powerful engine for realizing the ecological transformation of the economy. The creation and use of capacities from renewable energy sources, switching to energy-saving production, expanding the use of secondary resources, as well as creating conditions for extending the period of use of manufactured goods are important mechanisms that might contribute to changing the linear model of the country's economy into a circular one and making the "*green transition*". Of utmost importance for the successful realization of these activities is the creation of a favourable business climate for the development of small and medium-sized enterprises and the implementation of relevant projects aimed in this direction. An important component of the favourable business conjuncture supporting the development and prosperity of small and medium-sized companies is clear and sustainable legislation as well as regulations that guarantee transparency and clear rules and procedures. Along with these conditions, it is extremely important for the companies to have an accessible financial resource, which will be provided to them according to clear and sustainable rules, and in this way to make the "green" projects implementable.

A number of studies have been devoted in recent years to the problems related to ecologization, circular economy and "green" transition of European counties and Bulgaria (Camilleri, 2021, Cavallo, 2018, Chipeva, 2022, Clarkson, Lie, Richardson, Vasvari, 2008, Ivanova, 2015, 2016, 2018, Ivanova, Slavova, 2019, Ivanova, Chipeva, 2019, 2021, Pieroni, 2019). Attempts for measuring the progress of these processes based on different key statistical indicators are developed (Marin, 2014; Sneideriene, Viederyte, 2020; Zielinska, 2019). The role of state and private environmental expenditures in the green transition of EU countries has been studied (Chipeva, Ivanova, Velichkov, 2023). Studies on the problems of the ecological transformation and transition to the circular economy concerning small and medium companies in Europe and in Bulgaria in particular have not been met by now.

The aim of this study is to investigate and analyze the current progress, financial ability and access to financial resources as well as the outlooks of small and medium companies in Bulgaria in the green transition to ecologization of their activities including the use of "green" energy and technologies and reduce of carbon emissions that can limit the climate changes.

The research thesis is that despite the existing difficulties and great inertia in the process of transition to an ecological economy of the economy in general and small and medium companies in particular, certain steps are observed leading to carbon emissions reduce, cleaner energy-producing as well as partial elements of circularity in the production processes and consumption.

2. Data and Methodology

2.1. Data

Empirical data used in this study is based on a web-based sampling survey among the enterprises in Bulgaria with an accent on small and medium-sized companies conducted in October-December 2022 by the National Statistical Institute at the initiative of the Bulgarian Bank for Development. The online questionnaire was filled by the companies' managers. A sample of all the observed companies that met the criteria for small and medium-sized enterprises (up to 250 employed and either annual turnover up to 97,5 million BGN or a total balance of up to 84 million BGN) has been formed. A set of 554 companies have been included in the sample and involved in the current analysis respectively.

Data related to economic, financial and demographic specifics of the companies, to their attitude and progress on the way of the green transition, to their investments for ecologization of the production process as well as to needs for external funding and support, have been extracted from the questionnaire and are structured into appropriate variables.

2.2. Methodology

The methods applied in the study are mostly statistical and aim to explore the current situation and progress of small and medium companies in Bulgaria on the way of green transition, availability to financial resources and need for additional funding for the ecologization of their activities as well as outlooks of the processes. First, a multinomial classification of the

companies included in the analysis was carried out by applying cluster analysis. The classification was done using a set of 9 indicators (variables) presented in Table 1. Indicators were selected to present the attitude of the companies and the current progress in terms of their targets and activities for ecologization.

Table 1. Indicators used in the clusterization of the companies

No	Indicator	Statistical type of variable
1	Attitude to the green transition	nominal
2	Knowledge of green transition regulations	nominal
3	Awareness of the risks related to climate changes	nominal
4	Existence of a company strategy/policy for sustainability and climate neutrality	dichotomous
5	Implementation of international standards for environmental management (ISO or EMAS)	nominal
6	Existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	nominal
7	Program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	nominal
8	Program existence for waste reduce	nominal
9	Investments planned for energy efficiency and RES	dichotomous

Since all the variables that correspond to the indicators under consideration are of categorical type, Two Step Cluster Analysis has been applied for the companies' classification. Unlike the usual cluster analysis, this procedure provides an opportunity to use categorical variables in the classifying process assuming they are mutually independent. By the procedure of Two-Step Cluster Analysis, the optimal number of clusters is defined automatically based on comparing the values of a model-choice criterion across different clustering solutions. Classification importance of variables used can be assessed within the procedure and it is ranged on a scale from 0 (least important) to 1 (most important).

The specifics of each identified cluster were analyzed based on the empirical distributions of the companies in terms of the classifying variables along with some demographic characteristics. Similarities and differences between clusters identified that are related to the preferred way of green transition, green projects planned and the financial potential of companies to realize them are outlined using cross tabs and appropriate summary characteristics.

The correlation between the main characteristics of companies and their progress and outlooks in the green transition for each identified cluster was analyzed.

Data processing and statistical methods were applied with SPSS, v.23. Results are presented in appropriate charts and tables.

3. Results and Discussion

Three clusters were identified based on the 9 selected indicators (Table 2). First cluster is the smallest and includes one-fourth of the companies in the study. The second cluster is the largest – it includes 44.8% of the companies.

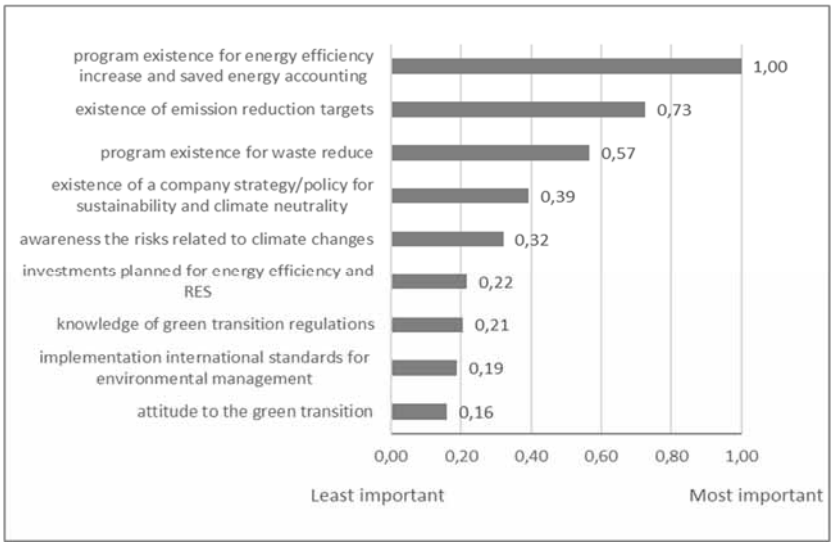
Table 2. Clusters description

Cluster	Number of companies	% of sample
1st cluster	135	25.2
2nd cluster	239	44.8
3rd cluster	160	30.0

Source: Autor's calculations obtained by SPSS.

Cohesion of clusters was estimated as *fair* taking into account that all the input variables are of categorical type. Five of the input variables are of high importance for cluster identification while the importance of the rest four variables is not so significant (Figure 1).

Figure 1. Separation importance of input variables

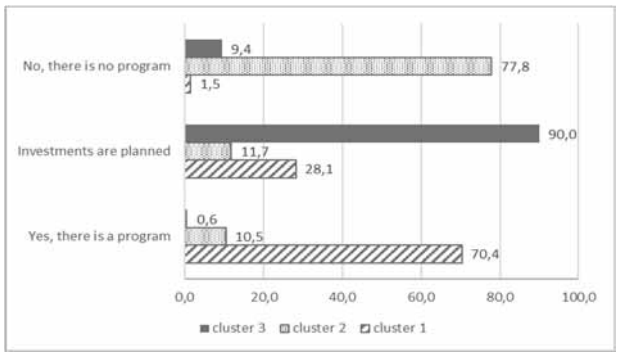


Source: Author's calculations.

The leading role of companies' clusterization plays program existence for energy consumption reduce, energy efficiency increase and saved energy accounting. Most companies implementing such programs are in the 1st cluster – 70.4% of all companies in the cluster (Figure 2). Almost all the rest of the companies in the cluster (28.1%) plan to invest in such programs and only 1.5% have no and do not plan to introduce in such programs. The opposite situation is presented in the 2nd cluster where 77.8% of the companies have no program energy efficiency. Only 10.5% of companies in this cluster implement such programs and 11.7% plan to make investments. The majority of the companies in the 3rd

cluster (90%) plan to invest in programs for energy efficiency but for now there are only 0.6% of them with such programs implementing.

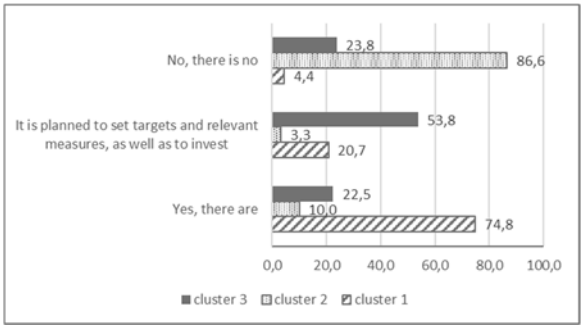
Figure 2. Program existence for energy consumption reduce, energy efficiency and saved energy accounting in the companies



Source: Author's calculations.

There is also a significant difference between clusters in terms of emission reduction targets of companies, including GHG emissions reduction, energy efficiency, waste reduction and recycling. The largest percentage of companies that have such goals are in the 1st cluster – 74.8% (Figure 3). 86.6% of the companies in the 2nd cluster do not have and do not plan to set such goals and measures. Only 10% of the companies have the goals mentioned. Regarding the 3rd cluster, just over half of companies intend to set targets for emissions reductions, energy efficiency and waste reduction and recycling. Almost half of the rest have such goals while the others do not.

Figure 3. Existence of emission reduction targets in companies



Source: Author's calculations

A similar situation in the clusters can be seen in relation to the other two indicators for progress of ecologization process used in the cluster procedure – existence of waste reduction programs and sustainability and climate neutrality strategy/policy in companies (Figure 4 and Figure 5).

Figure 4. Program of waste reduce in companies

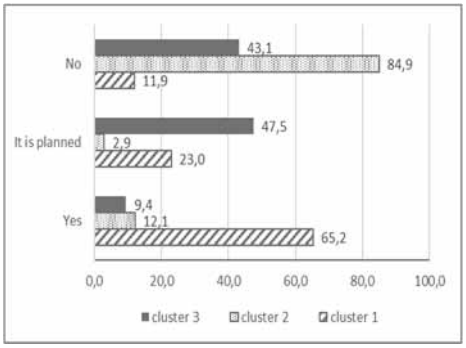
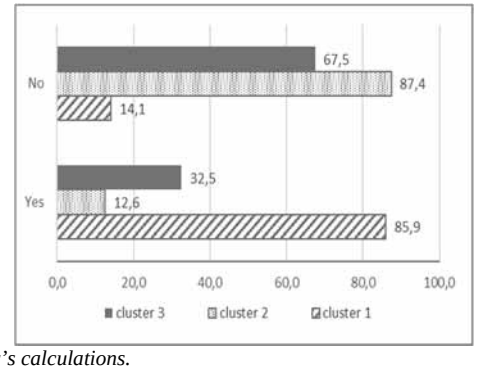


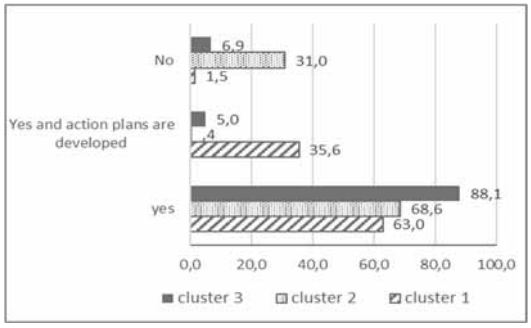
Figure 5. Company strategy/policy for sustainability and climate neutrality



Source: Author's calculations.

Most companies in all clusters are aware of the risk associated with climate change, but only a certain part of companies in the 1st cluster (35.6% of all in the cluster) have action plans developed (Figure 6). Almost one-third of companies in the 2nd cluster are not aware of this risk and only 0.4% of them have an action plan to reduce it.

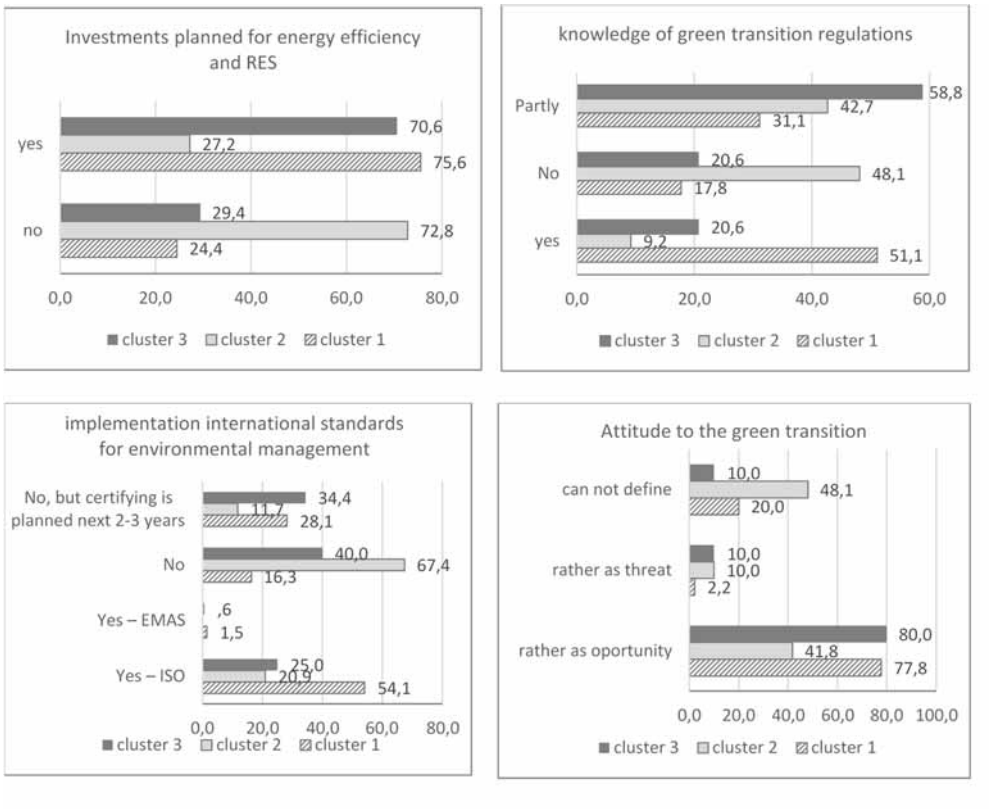
Figure 6. Awareness of the risks, related to climate changes



Source: Author's calculations

The remaining four indicators used in the analysis are not as much as important for the identification of the clusters, but they contribute to their final formation and help to emphasize some of their specifics. Above 75% of companies fallen in the 1st cluster see the green transition rather as an opportunity and plan investments mainly for energy efficiency and RES (Figure 7). More than 50% of them have knowledge of green transition regulations and implement international standards for environmental management. In contrast, almost half of the companies fallen in the 2nd cluster (48.1%) declare a lack of knowledge about the green transition and cannot define their attitude to it (Figure 7). Only 42.7% of them mention partly knowledge about the green transition. A significant part of these companies do not plan investments for energy efficiency and RES (72.8% of the companies in the cluster) and do not implement international standards for environmental management (67.4%).

Figure 7. Distributions of companies by the last four input indicators in the clusters

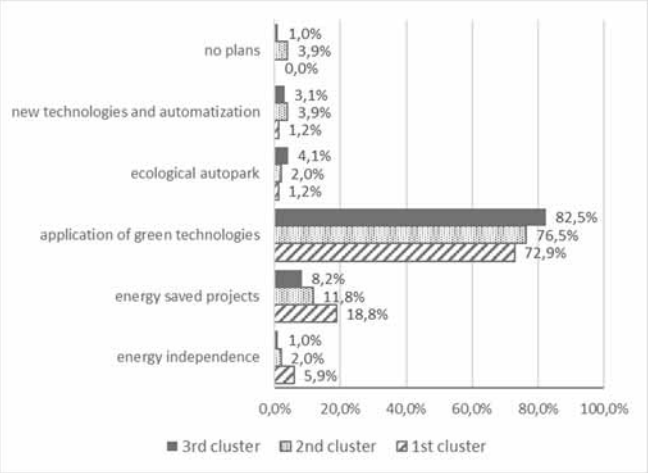


Source: Author's calculations

A significant part of the companies fallen in the third cluster (58.8%) also declare only partial knowledge on the green transition. At the same time, however, 80% of them regard on it rather as an opportunity and 70.6% plan investments for energy efficiency and RES (Figure 7). The majority of companies do not apply yet international environmental management standards, but 34.4% plan to become certified in the next 2-3 years.

Almost all the small and medium-sized companies in Bulgaria plan to realize *green* projects next year (Figure 8). The application of *green* technologies in common is most preferred by the majority of SMEs in all the clusters. Depending on the specific companies' activities, the technologies could be different but all of them aim for ecologization and green transition. Energy-saving projects are mostly preferred, where the companies from the first cluster are in the leadership position. The first cluster also has a leading position in terms of energy independence projects. The proportion of companies that do not yet have plans to adopt green technologies is too small. The usual reasons for this are either the specifics of their activity, which is not directly related to greening, or the lack of opportunity to undertake such changes.

Figure 8. Priority green projects planned by companies in the next year



Source: Author's calculations

The green transition way preferred by almost all small and medium-sized companies in Bulgaria is the implementation of energy efficiency measures, followed by renovation of equipment and building stock (Table 3). These preferences concern more so the companies in third and first clusters and rather less the companies in the second cluster. The smallest part of all companies, less than 3%, consider the new business launching as the appropriate way for a green transition.

Table 3. Preferred way for green transition (%)

Ways preferred for green transition:	1st cluster	2nd cluster	3rd cluster	Total
transfer of existing technologies	21.8	13.5	19.2	17.4
creation of new technologies	28.6	18.9	27.6	24.1
building stock renovation	39.8	25.7	44.9	35.2
renovation of equipment	48.1	37.4	45.5	42.7
business model change	10.5	8.1	10.3	9.4
new business launch	1.5	3.2	2.6	2.5
energy efficiency measures	58.6	50.5	62.2	56.2

Source: Author's calculations

The realization of the green transition is related more or less to a reorganization of companies' activities and requires usually additional/external financing. Only 8% of all surveyed companies do not need external financing to implement their greening programs, with the smallest share of companies from the 3rd cluster, and the largest number of companies that need external financing are in the 2nd cluster (Table 4). Most companies need financing for investments and working capital. More than 60% of the companies in the first and third cluster need credits to make investments in their business while they are about 45% in the second cluster. Companies in the first cluster mostly need credits for investments

(61.5%), working capital (43%) and energy efficiency and RES (42.2%) and least for export their production. The situation is similar with the companies from the third cluster. Their credit needs are mostly for investments (63.5%), energy efficiency and RES (44.7%) and working capital (40.9%). The credit needs of the companies from the second cluster are smaller in common view compared to the rest of the companies and are mostly aimed at acquiring working capital (54.2%) and investments (45.4%).

Table 4. Main areas where companies need external funding (%)

Needs of credit for:	1st cluster	2nd cluster	3rd cluster	Total
no need of external financing	7.4	11.8	2.5	8.0
working capital	43.0	54.2	40.9	47.6
investments	61.5	45.4	63.5	54.5
energy efficiency and RES	42.2	13.9	44.7	29.7
innovations	28.1	15.1	26.4	21.7
export	5.2	2.5	6.3	4.3
other	3.7	2.1	0.6	2.2

Source: Author's calculations

Almost 18% of small and medium sized companies prefer to use equity capital for financing their programs and activities related to ecologization and green transition (Table 5). The share of companies that rely on their own financing is significantly larger in the second cluster – almost a quarter of companies included in the cluster. Companies that do not need external financing in the other two clusters are around 13-14%. The most preferred external source of financing by all the SMEs are banks. A significant part of companies (around one-fifth) preferred to use family savings. The first cluster stands out from the others with a relatively larger share of companies that would use easy credit to finance their green activities while the third cluster differs with relatively more companies that would use equity funds for this purpose.

Table 5. Sources of funding preferred by the small and medium companies (%)

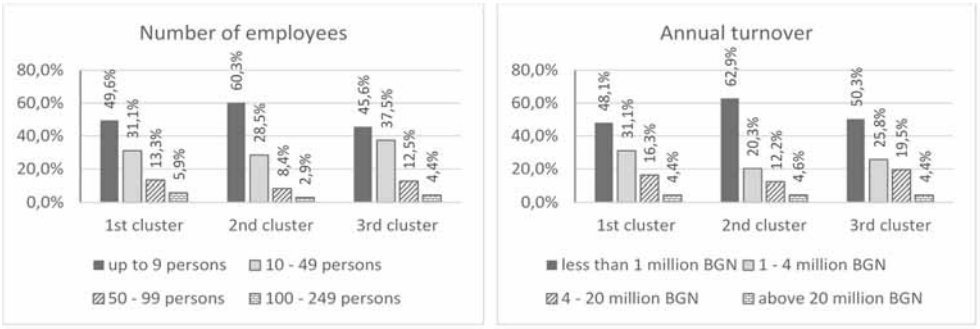
Sources of funding:	1st cluster	2nd cluster	3rd cluster	Total
banks are usual source of financing	78.5	69.7	79.9	75.0
non-bank financial institutions (leasing, factoring, others) are usual source of financing	15.6	10.1	12.6	12.2
family savings	21.5	16.8	20.1	19.0
easy credits	3.0	0.4	0.6	1.1
equity funds	0.7	0.8	3.1	1.5
external funding is not preferred	14.1	23.1	13.2	17.9

Source: Author's calculations

Distributions of companies by the number of employees and by the annual turnover in the clusters identified are rather similar, especially concerning 1st and 3rd clusters (Figure 9). Small companies prevail in all the clusters, but in the 1st and 3rd clusters, they don't exceed half of the respective group while in the 2nd cluster they are above 60%. Taking into account the largest size of cluster 2 it is clear that most small companies are included in it.

Accordingly, in this cluster, the share of companies with the least number of employees and the lowest annual turnover is the largest.

Figure 9. Companies' distributions by number of employed and by annual turnover



Source: Author's calculations.

Table 6. Chi-Square test and Cramer's correlation coefficient (V) between the company's number of employees and indicators for green transition used in the study

Indicator:	Cluster	Sig.of Chi-Square test	Cramer's V	Sig.of V
attitude to the green transition	1	0.560	0.190	0.560
	2	0.462	0.154	0.462
	3	0.067	0.271	0.067
knowledge of green transition regulations	1	0.821	0.147	0.821
	2	0.315	0.172	0.315
	3	0.830	0.133	0.830
awareness of the risks related to climate changes	1	0.825	0.146	0.825
	2	0.208	0.188	0.208
	3	0.922	0.111	0.922
existence of a company strategy/policy for sustainability and climate neutrality	1	0.031	0.256	0.031
	2	0.919	0.043	0.919
	3	0.107	0.195	0.107
implementation of international standards for environmental management (ISO or EMAS)	1	0.000	0.341	0.000
	2	0.000	0.241	0.000
	3	0.000	0.270	0.000
existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	1	0.746	0.114	0.746
	2	0.891	0.069	0.891
	3	0.166	0.169	0.166
program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	1	0.738	0.115	0.738
	2	0.012	0.186	0.012
	3	0.044	0.201	0.044
program existence for waste reduce	1	0.394	0.152	0.394
	2	0.093	0.151	0.093
	3	0.258	0.156	0.258
investments planned for energy efficiency and RES	1	0.439	0.142	0.439
	2	0.014	0.210	0.014
	3	0.796	0.080	0.796

Source: Author's calculations.

Most of the indicators used in the study for expressing the progress of companies in greening do not correlate with the annual turnover of the companies and the number of employees in them. Only the implementation of international standards for environmental management (ISO or EMAS) correlates with both the number of employees and annual turnover of the companies in all the clusters (Table 6 and Table 7).

Regarding companies in cluster 1, the presence of a sustainability and climate neutrality strategy/policy depends on the number of employees and annual turnover, although not rather strongly. Regarding the 2nd cluster, having a program to reduce energy consumption, increase energy efficiency and account for saved energy depends to some extent on both the number of employees and the annual turnover of the companies, and the number of employees has also some influence on planned investments for energy efficiency and RES. The number of employees of the companies in the 3rd cluster has some influence on having a program to reduce energy consumption, increase energy efficiency and account for saved energy, while their annual turnover has a weak influence on the attitude of companies to the green transition.

Table 7. Chi-Square test and Cramer's correlation coefficient (V) between the company's annual turnover and indicators for green transition used in the study

Indicator:	Cluster	Sig.of Chi-Square test	Cramer's V	Sig.of V
attitude to the green transition	1	0.671	0.122	0.671
	2	0.177	0.137	0.177
	3	0.026	0.213	0.026
knowledge of green transition regulations	1	0.424	0.149	0.424
	2	0.373	0.117	0.373
	3	0.806	0.097	0.806
awareness of the risks related to climate changes	1	0.922	0.086	0.922
	2	0.981	0.049	0.981
	3	0.783	0.100	0.783
existence of a company strategy/policy for sustainability and climate neutrality	1	0.066	0.231	0.066
	2	0.931	0.043	0.931
	3	0.709	0.093	0.709
implementation of international standards for environmental management (ISO or EMAS)	1	0.000	0.308	0.000
	2	0.009	0.190	0.009
	3	0.009	0.215	0.009
existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	1	0.609	0.129	0.609
	2	0.847	0.075	0.847
	3	0.484	0.131	0.484
program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	1	0.887	0.093	0.887
	2	0.018	0.180	0.018
	3	0.301	0.151	0.301
program existence for waste reduce	1	0.104	0.198	0.104
	2	0.647	0.094	0.647
	3	0.756	0.104	0.756
investments planned for energy efficiency and RES	1	0.896	0.067	0.896
	2	0.451	0.105	0.451
	3	0.289	0.154	0.289

Source: Author's calculations.

4. Conclusions

Based on the empirical analysis conducted it can be concluded that most small and medium-sized companies in Bulgaria have started the green transition process. There are a significant number of companies that are cutting-edge, and they are already well along the way. At the same time, there are companies that have not yet seriously realized the new world trends of greening and transformation of the economy to a circular model on a global scale and have not started or are at the very beginning of the green transition path.

According to the results of cluster analysis applied in the study, small and medium-sized companies in Bulgaria could be classified into 3 clusters. The largest cluster (cluster 2) significantly differs from the rest both by the economic profile of the companies included and by the progress in the green transition. This cluster embeds almost half of the studied companies most of which are small-sized. Almost half of the companies in the cluster cannot define yet their attitude to the green transition and have no knowledge of regulations related to it. A significant number of companies have no programs for energy efficiency increase including energy consumption reduce, waste reduce and emission reduction targets. Most of them have no strategy/policy for sustainability and climate neutrality, do not implement international standards for environmental management and do not plan investments for energy efficiency and RES. The business of these companies, most of which are family-owned, is in the field of trade or services. Of course, activities in these sectors do not exclude the introduction and use of green technologies, as well as environmentally friendly measures related to waste reduction, use of clean energy, etc. Companies in this cluster seem to be at the beginning of the way to the green transition and need more support both through appropriate policies and measures from the state and through the necessary proper financing.

The remaining two clusters have a similar structure in terms of the economic specifics of the companies in them. However, one of them (cluster 1) is leading in relation to the programs of energy efficiency developed including energy consumption reduce, waste reduce and else. A very large part of the companies in this cluster have emission reduction targets and strategy/policy for sustainability and climate neutrality set. More than half of companies have knowledge about green transition regulations and implement international standards for environmental management. Above 75% of companies plan to invest in energy efficiency and RES in the near future. This cluster is emerged as a leader in the process of economic ecologization and green transition.

The companies included in the last cluster (cluster 3) could rather be defined as having taken the path of the green transition, but there is still much to be done. Most of the companies in the cluster have not yet had emission reduction targets set and strategy/policy for sustainability and climate neutrality adopted. A significant part of companies has not yet programs developed for energy efficiency, included energy consumption and waste reduce. However, many of them plan to set targets for emission reduce and to make investments both for energy efficiency and RES and for waste reduce. A very large part of the companies are aware of the risk related to climate changes, but only 5% of them have action plans developed to reduce this risk and one-fourth of them implement international standards for environmental management. Almost 80% of the companies know the regulations of green transition or have partial knowledge about them and regard at it rather as new opportunities

for their business. It can be concluded that the companies in this cluster as a whole have already taken certain steps on the path of green transition. Of course, some of them are more ahead within the cluster regarding their progress in the greening, but compared to the companies from the other clusters, it can be said that they are in the middle of the way.

Over 90% of the companies in the survey report that they need external financing to make the green transition, with the lowest proportion of companies in Cluster 3 and the largest one in Cluster 2. Companies in the 1st and 3rd clusters need of funding mostly for investments, while the companies in the 2nd cluster needs external financing are mostly for working capital. Most companies look for credits predominantly from banks but a significant part of them rely also on family savings.

The number of employees and the annual turnover of companies generally correlate with the implementation of international environmental management standards, and in some companies, they also have an impact in terms of energy efficiency programs.

The general conclusion of the analysis is that a significant part of the small and medium-sized companies in Bulgaria have made more or less progress towards the green transition and the greening of the economy. The transition appears to be taking place more quickly in medium-sized companies operating in manufacturing, logistics and transport, while small, mostly family-owned, companies with businesses in retail or service are progressing more slowly in this process. However, all the companies need more serious and adequate support in the way of ecologization both by state regulations that are to be applied clearly and transparently and by adequate financing.

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ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
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NATURAL GAS AND THE DYNAMICS OF THE ENERGY MARKET – EASTERN EUROPE[3]

The paper looks into natural gas as a factor influencing the dynamics of the energy market in Eastern Europe. The energy market as such is in fact the correlation between various interrelated markets which have different effects on the final consumers' prices and on the inflation. The Eastern European energy market is currently one of the fastest-growing energy markets. It consists of resource-rich and transit countries (Belarus, Bulgaria, Czech Republic, Hungary, Poland, Moldova, Romania, Russia, Slovakia and Ukraine) with a population of roughly 291 million people, that contributes significantly to the world's energy consumption and security. The dynamics of this market depend on the new infrastructure for transiting and storing natural gas as well as the big undergoing investments in renewable energy infrastructure.
Keywords: energy market; natural gas; inflation; de-carbonization; Eastern Europe
JEL: Q4; R1; V1

1. Introduction to the Political and Economic Context

In Europe, the energy demand is currently the highest for the last 25 years. Added to this come the constraints and risks because of the drop in the supply of Russian gas.

The gradual increase from 2010 to 2020 in the demand for natural gas, in Eastern Europe was influenced by factors such as economic development, population growth, and increased energy consumption.

Another factor is the process of energy transition in some Eastern European countries that began to shift away from more carbon-intensive fuels, like coal, toward cleaner alternatives, including natural gas. This transition was often driven by environmental concerns and efforts to reduce greenhouse gas emissions.

Infrastructure development investments were made in natural gas infrastructure, including pipelines and liquefied natural gas (LNG) terminals, to expand the availability and

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accessibility of natural gas in the region. Improved infrastructure facilitated the transportation and distribution of natural gas.

Heating and Industrial players use natural gas and it also continues to be used for heating in residential and commercial buildings. Its versatility and relatively low cost made it an attractive choice for these applications. Energy Efficiency: Natural gas was employed in combined heat and power (CHP) systems, which offer high energy efficiency by simultaneously generating electricity and heat. These systems were utilized in various sectors, including district heating and industrial facilities.

Eastern European countries increasingly integrated their energy markets and collaborated on energy projects. This integration aimed to enhance the reliability of natural gas supplies and provide access to diversified sources.

Geopolitical factors, including concerns about energy dependence on certain suppliers, motivated some Eastern European countries to seek alternative natural gas sources and routes.

Further growth in gas demand is predicted in the whole of Europe within the short future, despite and because of the new policies to de-carbonize the economy. The internal EU production of natural gas trend is though not at all encouraging and urges for an increase of import.

Eastern Europe is traditionally a big importer of oil and natural gas from Russia, which makes the area highly vulnerable to the current Russia-Ukraine conflict.

Eastern Europe depends heavily on Russian gas to meet its needs, around 40% -50% of its supply mix but higher in some southern and eastern countries. Russian gas to Europe has increased since the 1980s (Parpulova, 2022).

The political changes in Europe's leadership and the escalation of the conflict resulted in an overall change of attitude towards Russian gas and petrol. Germany halted the certification of Nord Stream 2. The European gas prices rose by 28% week-on-week 1, and power prices rose by 38%.

Such increases put Eastern Europe's economy at risk of serious inflation. The connection between price levels in energy markets and inflation in the European Union is complex and can be influenced by various factors.

Energy is a fundamental input cost for many industries and households. When energy prices rise, it can lead to higher production costs for businesses, which may, in turn, be passed on to consumers in the form of higher prices for goods and services. This can contribute to overall inflation in the economy.

During the period between 2020-2022, energy continued to be a significant input cost for various industries and households across the European Union (Eurostat, 2022). Energy is a fundamental component of economic activity, and its cost can have a substantial impact on businesses and consumers. Here are some key points related to the role of energy as an input cost for the period 2020-2022: electricity (33.2%) and natural gas (32.7%) accounted for two-thirds of final energy consumption in the EU's industry sector. The remaining energy

products represented much smaller shares: oil and petroleum products (excluding biofuel) represented 9.8%, renewables and biofuels 9.7%, and solid fossil fuels accounted for 6.4%. (European Commission, 2022).

The countries from Eastern Europe are likely to be most significantly impacted by the gas stagnation, because of large Russian gas dependency and the use of an energy mix that is dominated by Russian gas. The upward trend of the prices of oil and gas imposed by the conflict in Ukraine faces Europe with one of the worst economic shocks since the 1970s. The remaining reliance on fossil fuels has caused energy prices in Europe to spiral out of control completely (Parpulova, 2022).

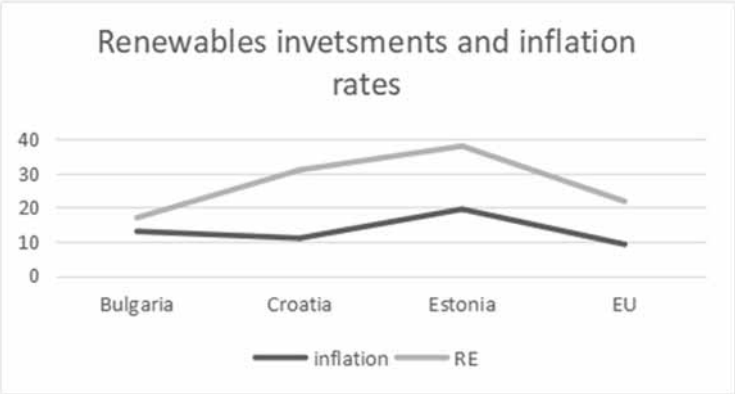
Cross-section experts are warning that the countries in Eastern Europe will be dragged into a deep recession if Russia puts a halt on gas supplies into Europe (International Energy Agency, March 2023).

There are two ways to mitigate escalation: one is to choose to replace Russian supplies with alternative sources or the other way is to decrease the usage of Russian oil and gas.

The EU leadership are throwing significant efforts and funding to lower its dependence on Russian gas by two-thirds before the end of this year and end imports completely by 2030. Such plans are bold as there is always the risk of Russia cutting off vital supplies more quickly which won't allow Europe any time for adjusting. The energy in the euro area is generated from natural gas (25% at least). One-third thus gas the bloc's imports from Russia.

Trying to mitigate the dependency risk (dependency from imports from Russia), most Eastern European countries are undertaking big investments in renewables. Looking closely at the statistics, there seems to be a trend that shows that these investments are also catalyzing inflation rates at least for the last 12 to 18 months since this process has been frantically encouraged by the policy-makers (Danielski, 2021).

Figure 1. Renewable investments and inflation rates



Source: Eurostat 2022.

Green power needs to be efficiently integrated into the wholesale market in order to reach the final consumer. This means short-term power trading needs to adapt to the specific characteristics of renewables. Over the past years, the energy markets have demonstrated their suitability to integrate additional renewable volumes whilst minimizing price impacts (Renewable Market Watch, 2018).

Energy is a vital input for all economic activities and everyday life. Modern economies globally rely on the extensive use of fossil fuels, the main contributor to climate change. Energy markets are facing the long-term challenge of moving towards a net zero future. The energy market has been quite challenged in terms of predictability for the last year 18 months. The expectations are that this transition will generate significant public expenditure and as a result, the different markets are reacting by increasing the prices.

After a significant increase in prices that started before the Russian invasion of Ukraine, but skyrocketed through the second semester of 2022, electricity and gas prices are now stabilizing. The prices of energy rose due to an increase in the price of natural gas, which is considered the marginal fuel. This happened because the imports from Russia decreased, and other importers were sought. The energy market is priced after the marginal fuel, which means that the price of natural gas affects the prices of the electricity market. Mechanisms were constructed in most of the Eastern European countries to alleviate the pressure on consumers, and the subsidies were one of these.

In the first half of 2023, average household electricity prices in the EU continued to show an increase compared with the same period in 2022, from €25.3 per 100 kWh to €28.9 per 100 kWh. Average gas prices also increased compared with the same period in 2022, from €8.6 per 100 kWh to €11.9 per 100 kWh in the first half of 2023. These prices are the highest recorded by Eurostat (Eurostat, Q1, 2023).

The price without taxes on electricity and natural gas is now decreasing.

Compared with the first half of 2022, in the first half of 2023 the share of taxes in electricity bills dropped from 23% to 19% (-4%) and in the gas bill from 27% to 19% (-8%), with all EU countries having in place governmental allowances and subsidies or reducing taxes and levies to mitigate high-energy costs.

High natural gas and electricity prices have had a significant impact on inflation, economic growth, living standards and wider policy goals such as decarbonisation.

2. Energy Market Specifics and Inflation

The energy market has been in the focus of public attention, especially in the countries in Eastern Europe for the last two years. Globally energy prices are soaring due to an overall natural gas shortage. During such a turbulent time, it’s important to have a good understanding of energy markets so one can make the best decisions for any type of organization (or government) both operationally and financially. Knowing what the energy market is about and how does it function will help make choices, such as regulated or

deregulated energy markets, and more (Anderson, 2022) at Sustainability and Energy Management Simplified.

Energy markets can be highly volatile, with prices subject to fluctuations due to factors such as supply and demand dynamics, geopolitical events, weather conditions, and energy policy changes. These price fluctuations can have a direct impact on inflation as they affect the cost of living for consumers and the cost of production for businesses.

The extent to which changes in energy prices affect inflation depends on the degree of pass-through from energy costs to other parts of the economy. If businesses are able to pass on higher energy costs to consumers, it can lead to a more direct link between energy prices and inflation.

The European Central Bank's (ECB) response to managing inflation generated by the volatile energy market was based on the perception that the energy price increases are transitory or temporary.

In 2021, the European Central Bank (ECB) faced the challenge of managing inflation and economic recovery in the context of higher energy costs and the ongoing impact of the COVID-19 pandemic.

The ECB maintained its monetary policy stance throughout 2021. This included keeping policy interest rates at historically low levels, with the main refinancing rate at 0.00% and the deposit rate at -0.50%. These low-interest rates were intended to support borrowing, spending, and economic activity, including addressing any potential inflationary pressures resulting from higher energy costs.

The ECB conducted a strategy review in 2021, culminating in a new inflation target announcement. The ECB revised its target to aim for inflation of 2% over the medium term, with a symmetric approach that allowed for temporary deviations above or below the target. This adjustment provided the ECB with flexibility in responding to inflation dynamics, including those influenced by energy price fluctuations.

The ECB acknowledged the potential impact of higher energy costs on short-term inflation but emphasized its focus on medium-term trends and its willingness to take action if necessary. It closely monitored economic developments and the impact of energy prices on overall inflation. Its decisions and responses were data-dependent, taking into account the broader economic context and the ongoing challenges posed by the pandemic.

The ECB continued to integrate climate change considerations into its policy framework. While not specific to energy costs, these efforts aimed to address longer-term sustainability and environmental risks.

It's important to note that the ECB's actions in response to higher energy costs in 2021 were part of its broader efforts to achieve its price stability mandate and support economic recovery in the EU.

At the same time, the current global energy crisis has placed electricity security and affordability high on the political agenda in all EU countries, including the planned infrastructure investments in the energy sector.

3. Infrastructure – the Blood Vessels of the Energy Market

Thanks to the TEN-E policy (Trans-European Networks for Energy) and the financial support through the Connecting Europe Facility, cohesion funds, and other instruments, several new gas pipelines, interconnectors and LNG terminals in Central-Eastern and South Eastern Europe have come online.

The EU has successfully supported enabling reverse flows on most of the existing interconnections in the region, including those with Ukraine and Moldova; The region is no longer isolated, as the new infrastructure opened access to new regional supply sources (such as direct access to pipeline gas from the Caspian region and access to the global LNG market from the Świnoujście LNG terminal and the Krk FSRU, and shortly from Alexandroupolis FSRU), increased market integration, and enhanced risk preparedness and resilience even in extreme demand conditions (Arsalane, 2021) (net zero 2050).

3.1. Projects of Common Interest in energy infrastructure in the Central and South-Eastern region. Achievements in electricity infrastructure

Several cross-border transmission infrastructure projects in Bulgaria have been completed, as well as an interconnection between Slovenia, Hungary, and Croatia. Two new interconnectors between Slovakia and Hungary have also been completed;

Sincro.Grid (CEF grant of 42 million EUR), a smart grid project between Slovenia and Croatia, has successfully introduced innovative control tools and organization models on top of infrastructure investments enabling cross-sector integration and consumer engagement.

These achievements have prepared the infrastructure in the region to also integrate significant volumes of renewable energy generation for which there is plenty of potential.

3.2. Way forward

The remaining priority infrastructure investments in the region, which are set to be finalized in 2023, are the IBS (gas interconnector between Serbia and Bulgaria) and the construction of the Alexandroupolis FSRU and FSRU terminal in Vassiliko, Cyprus. The latter will effectively end the gas isolation of Cyprus, allowing the country to connect to the global LNG market and diversify its imported energy sources and fuels.

The planned expansion of several underground gas storage facilities in Chiren, Bulgaria (CEF grant of 79 million EUR), as well as in Bilciuresti, Romania (CEF grant of 38 million EUR), and Greece is expected to significantly contribute to enhancing the security of supply and market integration in South-East Europe.

More electricity interconnections are being developed and finalized. For instance, after having finalized the Bulgarian section of the Greece – Bulgaria electricity interconnector (CEF grant of 28 million EUR), the project is expected in operation in 2023.

Other key electricity interconnector projects are expected to be completed in the coming years, notably the Trans- Balkan Electricity Corridor, the Romanian section of the Black Sea Corridor between Romania and Bulgaria, or the Mid Continental East Corridor between Romania and Serbia as well as Euro-Asia, undersea cable from Israel to Crete via Cyprus.

Total funding under the Connecting Europe Facility (CEF) for the region: 2.86 billion EURO.

Total funding under the European Energy Program for Recovery (EEPR) for the region amounts to 234 million EURO.

4. Renewable Energy Sources

Speaking of the capacity for integrating significant volumes of renewable energy generation in the region we need to look slightly broader than just Eastern Europe- the CESEC region (Central and South Eastern Europe).

Electricity from RES is expected to reach shares of either 49% or 53.1% in the CESEC electricity mix by 2030, depending on whether the reference NECP (National Energy Climate Plans) or the Green Deal targets are implemented (ECORYS report, February 2022).

By 2050 electricity from RES is expected to reach either 75-77% or 85-87% of the regional electricity mix, in reference of the Green Deal scenarios.

Member States (MS) of the CESEC region, compared to the non-EU Member State counterparts: to reach the Green Deal targets, RES power generation in the EU Member States would need to slightly more than double, whereas, for the non-EU Member States, the increase should be at least four-fold. Power from photovoltaic systems – both centralized and decentralized – stands out as the largest contributor to the future energy mix. Onshore wind is a close second largest contributor (ECORYS report, February 2022).

The reality is though that the transition towards a carbon-neutral society is a polarizing topic within the EU especially because of the actual fact that the countries face very different problems and want to fulfil these new policies in the context of existing patterns of uneven development. Although the climate crisis threatens our quality of life, the transition towards de-carbonization is slow.

5. Price-Risk Management and Electricity Regulation and Balancing in Eastern Europe – Major Part in the Performance of the Energy Market

In a number of EEA Member States and Energy Community Contracting Parties, key functions are related to the Transmission System Operators (entities operating independently from the other electricity market players and are responsible for the bulk transmission of electric power on the main high voltage electric networks). The tasks of these third parties, include, among others, facilitation of balancing markets, imbalance calculation and settlement, data publication related to electricity balancing markets and issuing of the rules related to balancing markets. These tasks underpin the electricity market and represent the

link between the physical exchange of electricity among market participants and the financial outcomes (Europex, 2022). This is the Association of European Energy Exchanges, the business association for energy exchanges, market operators and delegated operators in Europe.

The efficient regulating and balancing by definition, supports effective, liquid, secure and transparent European wholesale energy markets. It works to promote the competitiveness of European energy markets and to ensure that the European financial services framework appropriately addresses the special characteristics of the energy commodity derivatives markets and their participants. This allows for proper price risk management and contributes to the energy transition in Europe.

Price risk management, especially, plays a crucial role in the energy transition in Europe by providing stability and predictability to the energy markets. The energy transition refers to the shift from fossil fuels to renewable energy sources and the implementation of more sustainable and environmentally friendly energy systems.

There are different instruments, used in Eastern Europe, where the markets are extremely price sensitive. Some of them are:

- Investment Incentives: Renewable energy projects, such as wind farms and solar power plants, require significant upfront investments. Investors and project developers need certainty regarding future revenue streams to justify these investments. Price risk management tools, such as long-term power purchase agreements (PPAs) and hedging strategies, provide this certainty by locking in prices for the sale of renewable energy over extended periods. This encourages more investment in renewable energy infrastructure.
- Integration of Renewable Energy: Renewable energy sources like wind and solar are inherently variable. Managing the price risk associated with their intermittency is essential for grid stability. Energy markets use price risk management tools like spot and forward contracts to balance supply and demand and ensure a reliable energy supply, even with intermittent renewables in the mix.
- Risk Mitigation for Utilities: Traditional utilities with a mix of conventional and renewable assets can use price risk management to mitigate the volatility of energy prices. By hedging against price fluctuations, utilities can stabilize their revenue streams, making it easier to invest in and support the growth of renewable energy assets.
- Market Development: Well-developed energy markets with effective price risk management mechanisms attract more participants, including renewable energy developers, investors, and consumers. This increased market activity can lead to greater competition, innovation, and cost reductions in the renewable energy sector.
- Consumer Protection: Price risk management tools can also protect energy consumers from extreme price spikes in volatile markets. This ensures that consumers can access affordable and reliable energy, which is essential for the acceptance and support of the energy transition.
- Regulatory Framework: Effective price risk management often requires a supportive regulatory framework. Governments and regulators can play a crucial role in promoting

the use of risk management tools, setting standards for transparency and fairness in energy markets, and incentivizing the adoption of renewable energy.

In summary, price risk management is an essential component of the energy transition in Eastern Europe. It provides the stability and confidence necessary for investors, utilities, and consumers to engage in renewable energy projects and helps ensure the reliable integration of renewable energy into the grid. As Europe continues to transition towards a more sustainable and low-carbon energy system, effective price risk management will remain a key enabler of this transformation.

6. Eastern European Energy Market (EEEM)

The European Union has become the world's fastest growing energy market and also the biggest gas import market. It possesses a range of energy import sources.

The Eastern European energy market (EEEM) is currently one of the fastest-growing energy markets. It consists of resource-rich and transit countries (Belarus, Bulgaria, Czech Republic, Hungary, Poland, Moldova, Romania, Russia, Slovakia, Ukraine) with a population of roughly 291 million people, that contribute significantly to world energy security (Mousavi, 2021).

The European Energy Exchange (EEX) offering for the Eastern European power markets, comprises Bulgaria, Czech Republic, Hungary, Poland, Serbia, Slovakia, Slovenia and Romania. Since the migration of Power Exchange Central Europe (PXE) products onto the EEX platform in 2017, liquidity in cleared power futures within the Central South Eastern Europe region has almost doubled each year thereafter.

In 2019, EEX achieved a record trading volume of 185 TWh, up from 102 TWh in 2018. The trade has doubled from 2018 to 2020. Some of these economies though while being under the same roof tend to face very diverse challenges when it involves their energy supply balance (Riediger, 2021).

It is a continuing argument by energy experts when discussing East European and Turkish gas markets that the region lacks the infrastructure to assist wean itself off Russian imports. However, with new importing terminals for liquefied fossil fuel being added, new transmission corridors established, and interconnection capacity expanded, discussing the region's lack of interconnectivity is actually yesterday’s argument.

Countries like Bulgaria, Poland and also the Check Republic are heavily reliant upon coal mining to balance their energy markets and to keep the costs bearable both for the consumers and for the industry. Nevertheless, their economies are still swept by the energy railing prices and suffer badly from the increases.

7. EEEM and the Inflation Rates

Going back to the natural gas crisis that occurred during 2021-2022, it had a significant impact on the European Union as a whole, not only in terms of energy security but also in its repercussions on the day-ahead electricity markets and, subsequently, final electricity prices and inflation. To understand this link in more detail and draw relevant conclusions, let's look into the intricacies of this situation.

7.1. Dependency on Natural Gas

The EEEM countries heavily rely on natural gas as a primary energy source, especially for electricity generation. Gas-fired power plants play a crucial role in balancing the grid and providing electricity during peak demand. As a result, fluctuations in natural gas prices directly affect the energy market.

Dependency on natural gas in Eastern Europe is a significant aspect of the region's energy landscape. Natural gas plays a vital role in the energy mix of these countries and this dependency has several key implications:

- Electricity Generation: Natural gas is a crucial source of energy for electricity generation. Gas-fired power plants provide a flexible and reliable source of electricity, particularly during periods of peak demand. They can quickly respond to fluctuations in demand, making them an essential part of the energy grid.
- Heating and Industry: Natural gas is also widely used for heating in residential, commercial, and industrial applications. It is a preferred energy source in many industries due to its high energy content and relatively low environmental impact when compared to some other fossil fuels.
- Import Reliance: Eastern Europe is heavily reliant on natural gas imports. While some EU countries produce significant amounts of natural gas domestically, others depend on imports from countries like Russia, Norway, and Algeria. This import dependence raises concerns about energy security and geopolitical vulnerabilities.
- Energy Transition Challenges: The EU's ambitious climate change – de-carbonization efforts require a shift away from fossil fuels, including natural gas, which can be a complex and costly endeavour.
- Interconnected Energy Markets: The interconnectedness of energy markets in the EU means that disruptions or fluctuations in natural gas supply can have a cascading effect on other energy markets, such as electricity. This interdependence highlights the need for diversification and resilience in the energy sector.
- Price Volatility: Natural gas prices can be subject to significant volatility due to factors like geopolitical tensions, supply disruptions, and changes in global demand. This volatility can have direct and immediate impacts on energy costs for consumers and businesses.

- Energy Security Concerns: Diversifying gas supply sources and routes and investing in infrastructure such as liquefied natural gas (LNG) terminals and pipelines are strategies to enhance energy security.

Dependency on natural gas is a complex issue with both advantages and challenges. While natural gas has been an important energy source, its role is evolving as the EU seeks to reduce emissions and enhance energy security. The transition to cleaner and more diversified energy sources is a significant focus, and managing this transition is a key element of the EU's energy policy.

7.2. Interconnected Markets

The European energy market is highly interconnected, with electricity markets closely linked to the natural gas market. This interconnection is not only on a national level but also across borders, as part of the larger European energy network. This means that changes in one market can have immediate and far-reaching effects on the other.

The interconnectedness of European energy markets, where changes in one market can have immediate and far-reaching effects on another.

For instance, cross-border Electricity Trade: European countries have established interconnected electricity grids that allow for cross-border electricity trade. This facilitates the sharing of electricity resources across countries. For example, the European Network of Transmission System Operators for Electricity (ENTSO-E) coordinates electricity transmission and market operation across 42 European countries. (The UK Energy Research Centre (UKERC), 2022)

Gas-to-Power Link: The link between natural gas and electricity markets is evident in the gas-to-power relationship. When natural gas prices rise, it becomes more expensive to generate electricity using gas-fired power plants. As a result, electricity generators may switch to alternative sources like coal or renewables, affecting both the natural gas and electricity markets.

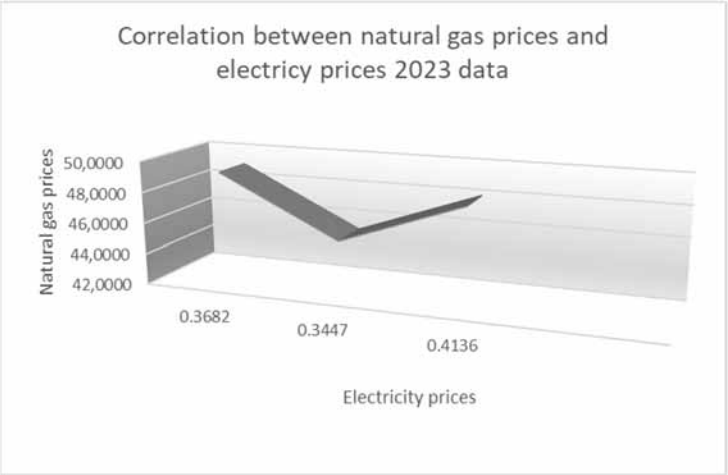
Market Coupling: The European Union has promoted market coupling, a practice where different electricity markets in neighbouring countries are linked, making it possible to buy and sell electricity across borders. This coupling relies on the availability of generation capacity and transmission infrastructure, which is often fueled by natural gas power plants.

Renewable Energy Integration: The fluctuating nature of renewable energy sources, such as wind and solar, has increased the need for flexible natural gas power plants to balance the grid. As more renewables are integrated into the energy mix, the relationship between gas and electricity markets becomes even more critical for grid stability.

Impact of Gas Supply Disruptions: When there are supply disruptions or geopolitical tensions affecting natural gas imports, this can lead to concerns about electricity generation. Gas-fired power plants may face reduced availability of fuel, potentially leading to increased reliance on alternative energy sources or higher electricity prices.

Price Correlation: The correlation between natural gas and electricity prices is well-documented. Historical data often shows that changes in natural gas prices are followed by corresponding changes in electricity prices, especially in markets where gas-fired generation is significant.

Figure 2. Correlation between natural gas prices and electricity prices



Source: Eurostat, 2023.

The interconnectedness of European energy markets, particularly between natural gas and electricity, is supported by the operation of cross-border electricity trade, the impact of gas supply disruptions on electricity generation, and the historical correlation between gas and electricity prices. This interconnection is a fundamental aspect of the European energy landscape, and changes in one market can indeed have immediate and far-reaching effects on the other, underscoring the need for coordinated and balanced energy policies in the region.

7.3. Price Correlation

Natural gas prices often serve as a benchmark for electricity prices. When natural gas prices rise, it becomes more expensive to generate electricity using gas, leading to higher electricity prices. Conversely, when gas prices fall, electricity prices tend to follow suit. This strong correlation can be observed in day-ahead electricity market prices.

To illustrate the relationship between natural gas prices and electricity prices, I can provide some statistics:

- Natural Gas Prices: Let's consider a hypothetical increase in natural gas prices
- Natural Gas Price in 2020: $2.50 per MMBtu
- Natural Gas Price in 2021: $3.50 per MMBtu

Electricity Prices: Corresponding to the rise in natural gas prices, electricity prices can increase due to the higher cost of fuel for gas-fired power plants. Here's a simplified example

- Average Residential Electricity Price in 2020: 10 cents per kWh
- Average Residential Electricity Price in 2021: 12 cents per kWh

In this hypothetical scenario, when natural gas prices increased from $2.50 to $3.50 per MMBtu, electricity prices for residential consumers increased from 10 cents to 12 cents per kWh. This illustrates the correlation between natural gas and electricity prices, with the rise in gas prices leading to higher electricity prices.

However, it's important to note that the relationship between natural gas and electricity prices can be influenced by various factors, including the energy mix, electricity market dynamics, and regulatory policies. Additionally, not all electricity generation relies on natural gas, as the energy mix includes coal, renewables, nuclear, and other sources, which can also impact electricity prices.

During the whole of 2022, the worth of energy within the EU has been a number one topic for all. The reasons behind this escalation of energy prices are many, but two key ones were:

- not enough oil and natural gas supplies
- limited internal production, especially of natural gas

These two factors caused instability within the markets, and energy prices were rising every day.

European gas futures have broken record after record last year, as Russia capped flows to the region even as cargoes of liquefied fossil fuel were diverted to Asia. Soaring energy costs helped send Eurozone inflation at very high levels, according to Q1 to Q4 figures in 2021.

Energy prices have a significant impact on inflation in the Eurozone. Energy prices are a component of the Consumer Price Index (CPI), which is a commonly used measure of inflation. When energy prices rise, it can lead to higher overall inflation, as it increases the cost of living for consumers and the production costs for businesses.

7.4. Energy prices and Eurozone inflation are interconnected.

Direct Impact on CPI: Energy prices, particularly oil and natural gas prices, are directly included in the basket of goods and services used to calculate the CPI. When energy prices increase, the cost of items such as gasoline, heating, and electricity also rises, leading to an increase in the overall CPI.

Indirect Impact on Production Costs: Energy is a fundamental input in many production processes across various industries. When energy prices rise, it can increase the cost of production for businesses. These increased production costs can be passed on to consumers in the form of higher prices for goods and services, contributing to inflation.

Consumer Spending: Higher energy prices can reduce consumers' disposable income, as more of their income is allocated to paying for energy-related expenses. This can lead to

reduced consumer spending on other goods and services, which can have a broader impact on the economy and inflation.

Supply Chain Effects: Rising energy prices can affect transportation costs and supply chains, potentially leading to higher prices for goods and services due to increased logistics expenses.

Inflation Expectations: If consumers and businesses expect energy prices to continue rising, it can influence their inflation expectations. Expectations of higher future prices can lead to demand-side inflationary pressures as people rush to purchase goods and services before prices increase further.

Monetary Policy Response: the European Central Bank (ECB), adjusted its monetary policy in response to changes in energy prices and inflation. The energy-driven inflationary pressures were considered deemed temporary and the choice was not to raise interest rates aggressively.

It's important to note that energy prices can be volatile and subject to various external factors. Therefore, their impact on inflation in the Eurozone can vary over time. Central banks and policymakers closely monitor energy prices and their effects on inflation when making decisions about monetary policy and economic stability.

7.5. How do we form electricity prices? Cost of Electricity

It depends on several factors, such as:

Fuel Cost: The major cost of generating electricity is the cost of the fuel. Different energy sources can be used.

Building Cost: Another key is the cost of building the power plant itself. A plant may be very expensive to build, but the low cost of the fuel can make the electricity economical to produce. Nuclear power plants, for example, are very expensive to build, but their fuel—uranium—is inexpensive. Coal-fired plants, on the other hand, are cheaper to build, but their fuel—coal—is more expensive.

Efficiency: When figuring cost, you must also consider a plant's efficiency. Efficiency is the amount of useful energy you get out of a system (National Energy Education Development Project, 2019).

In general, today's power plants use three units of fuel to produce one unit of electricity. Most of the lost energy is waste heat. A typical coal plant burns about 4,500 tons of coal each day. About two-thirds of the chemical energy in the coal (3,000 tons) is lost as it is converted first to thermal energy, then to motion energy, and finally to electrical energy.

Gas is a major supply element for the production of electricity. According to 2021 figures and statistics world gas consumption is growing to 4.2 trillion. cubic meters.

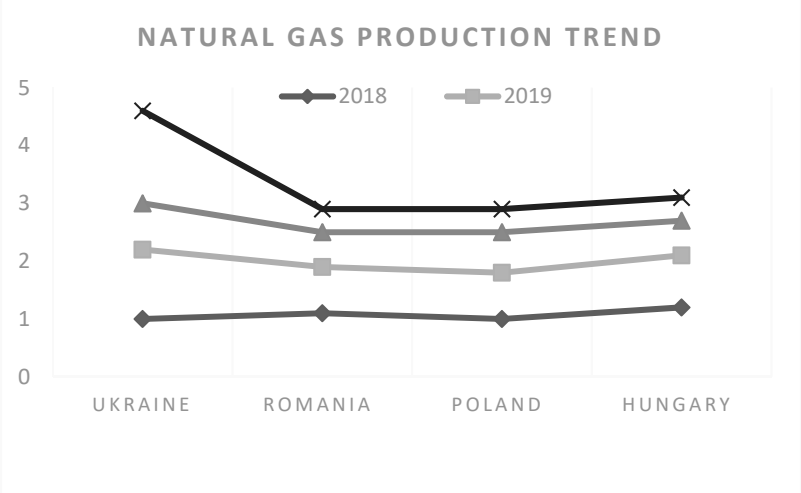
Natural gas is considered a relatively cleaner fossil fuel compared to coal and oil, and it is often used for electricity generation, heating, and industrial processes. It's also seen as a transitional energy source as countries work to reduce carbon emissions. Natural gas has

often been viewed as a bridge fuel during this transition due to its lower carbon emissions compared to coal and oil.

Natural gas is commonly used for heating homes and buildings in Europe, especially in the colder regions. It's also an essential energy source for various industrial processes.

Further growth in gas demand is predicted in Europe within the short future, despite and because of policies to decarbonize the economy. The internal EU production of natural gas trend is not encouraging and urges for an increase in import.

Figure 3. Natural Gas production trend in some Eastern European countries



Source: Global Data, Upstream analytic

8. External to Eastern Europe Factors Affecting the Energy Market

The Organization of Petroleum Exporting Countries (OPEC) and its partners have been urged to extend the oil extraction volumes, so as to smooth down the energy prices. This is because the highest crude prices in seven years threaten the world economic recovery with an inflationary surge worldwide. The costs are near $85 a barrel in London, whipped up by a world energy crunch centred in fossil fuel markets.

OPEC seems reluctant to attend to the demand and the counterargument is that the extra oil barrels would do nothing to alleviate the energy crisis when the actual shortfall is in gas supplies. Fuel demand remains liable to ongoing outbreaks of COVID-19, and oil markets are in any case likely to return to surplus early next year, without taking any extra measures to fill in a very gap within the energy market.

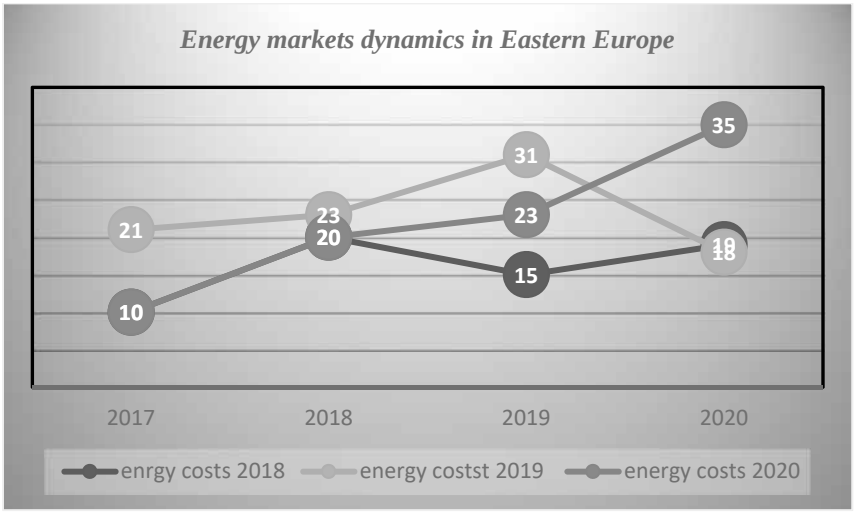
In Europe, the energy demand has been the highest for the last 25 years. The consumption influenced by different boosters has grown steadily in Europe with an arithmetic progression.

$$a_{n+1} = a_n + d$$

(a_n- year n consumption, d- progression factor)

Further risk and constraint come from the drop in the supply of Russian gas. The market was roiled in early trading, with benchmark gas futures surging the maximum amount of 15% before paring gains, as Russian gas started flowing eastward from Germany to Poland.

Figure 4. Energy Markets Dynamics in Eastern Europe



Source: https://www.eex.com/en/markets/power-derivatives-market/csee-power-markets.

Russian gas shipments entering Germany's Mallnow compressor station dropped to zero at the start of November this year, consistent with data from grid operator Gascade. Russian gas transit to the European Union via Ukraine also dropped. Natural gas and power prices remain triple the standard levels for this point of the year. There has been an unprecedented increase in global gas prices (Mazneva, Shiryaevskaya, Almeida, 2021).

The other factor that stirs the energy market is the European actions for climate protection and the rather optimistic counting on renewable sources, the assembly of which, however, is unstable, and therefore the promotion of the abandonment of coal and other fossil fuels lacks economic justification, especially in the near future.

Due to the actual fact that an efficiently functioning internal gas market is the key to the security of supply throughout the European Union, a plan is needed to strengthen the cooperation between Member States in relevant risk groups:

Group 1:

States belonging to the chance group: Belgium, Check Republic, Germany, Estonia, Latvia, Lithuania, Luxembourg, The Netherlands, Poland and Slovakia.

Group 2:

States belonging to the danger group: Bulgaria, Cyprus, Germany, Greece, Croatia, Italy, Luxembourg, Hungary, Austria, Poland, Romania, Slovenia and Slovakia.

At present, countries from Ukraine in the north to the Balkans and Turkey in the south –all face very diverse and different challenges.

9. The four big challenges to the energy markets in Eastern Europe

9.1. The first challenge

The first challenge relates to meeting the net zero emission target. This concept is a central part of efforts to mitigate climate change and limit global warming to well below 2 degrees Celsius above pre-industrial levels, as outlined in the Paris Agreement.

Key elements of a net-zero emission target include Greenhouse Gas Emissions Reduction. The primary focus of a net-zero target is on reducing greenhouse gas emissions, including carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), which are the main drivers of climate change. Emissions can come from various sectors, including energy, transportation, industry, agriculture, and land use.

This suggests that countries like Romania, Bulgaria, Greece, Turkey, and Ukraine, where between 30-40% of electricity generation remains supported by lignite or coal, should frantically look for alternatives.

Conservative estimates by ICIS (Independent Commodity Intelligence Services) show that a minimum of another 6.5 GW of recent gas-fired capacity is needed in Bulgaria, Greece, and Romania to exchange coal-fired generation within the following ten to fifteen years. This might be additionally to more fossil fuel being required as distribution zones expand to incorporate more consumers (Sabadus, 2020).

In other words, gas will remain a very important fuel regionally for an additional decade, if less.

9.2. The second challenge

The second challenge is a way to access the abundance of diverse gas imports in southern countries like Greece and Turkey.

The Turkish gate. Turkey lies adjacent to countries or regions possessing some 71.8 percent of the world's proven gas reserves (111.88 trillion cubic meters out of total world proven reserves of 155.78 bcm) and a few 72.7 percent of the world's proven oil reserves 762.7 billion barrels out of total world proven reserves of 1,047 bn barrels (Roberts, 2020).

Gas Transit Issues are of vital importance for the energy balance in Eastern Europe. The European Union is already the world's biggest gas import market while it's also one of the world's fastest-growing energy markets. It possesses a range of energy import sources, notably Russia and Algeria but is of course seeking to diversify supplies. Turkey's role is potentially very important as it furnishes a natural corridor through which gas from a good

sort of suppliers in an arc from the Caspian through the centre East and also the Gulf to Egypt can access the growing EU market by pipeline. The EU already receives huge quantities of gas from three main sources – Russia, the sea and geographical regions.

9.3. The third challenge

Addressing this question also will help solve the third challenge, which relates to storing volumes. The foremost important type of gas storage is in underground reservoirs. There are three principal types: depleted gas reservoirs, aquifer reservoirs and salt cavern reservoirs. Each of those types has distinct physical and economic characteristics which govern the suitability of a selected form of storage type.

Gas storage operators are increasingly positioning themselves on new markets as first as backup for variable wind and alternative energy. It is a future energy system where electricity and gas are going to be more closely integrated (Simon, 2019).

With 1,200 terawatt hours (TWh) of existing capacity in Europe, the potential of gas storage is indeed massive. But the road to such a hybrid energy system is paved with uncertainty.

Bulgaria’s strategic location makes it a good hub for passing along fossil fuel to the remainder of Europe. Bulgarian section of the Black Sea called the Galata Exploration Block. Situated 22 km (13.7 miles) offshore near the town of Varna, Galata could be a prime gas storage option with a capacity of two.2 billion cubic meters (bcm), which is such as about 70 per cent of the annual gas demand in Bulgaria. The proposal for an offshore gas storage facility near the town of Varna, specifically in the area of Galata, could have significant implications for Bulgaria's energy security and gas supply.

The development of an offshore gas storage facility near Varna, Galata, with a substantial capacity could offer significant benefits to Bulgaria's energy security and gas supply management. It would provide a strategic asset for the country, allowing it to better cope with variations in gas demand, improve energy resilience, and diversify its gas supply sources and routes. However, such projects also come with regulatory, environmental, and stakeholder considerations that need to be carefully managed during the planning and development phases.

Storing fossil fuel in former, depleted gas fields is among the foremost cost-effective and technically sound ways to stockpile large energy reserves and protect against unexpected supply, demand and price fluctuations.

Ukraine, with its 30 billion cubic meters of capacity, could offer this space for storage. Indeed, Ukraine has already become Europe’s storage hub in 2020, when the number of nonresident companies, mainly from Central and Western Europe, rose to 81 compared to only seven in 2018.

Ukraine, Moldova, and Romania are keen to tap new sources of supplies imported within the south, Bulgaria, Greece, and Turkey and are going to be looking to ship volumes northwards.

9.4. The fourth challenge

This ends up in a fourth challenge, which relates to guaranteeing a bidirectional transit corridor that will not only facilitate flexible flows but also allow countries to realize or retain transit revenue. Securing transit revenue may be a challenge in itself because most regional countries saw a crucial source of money dry out when Russia's Gazprom diverted exports to the newly commissioned TurkStream corridor on January 1, 2020.

Securing transit routes is a very complex investment for each country. There should always be a risk analysis. These countries should invest in:

- Analyzing pipeline infrastructure to identify vulnerabilities
- Engineering solutions to reduce the likelihood of potential damaging risks or cyber-attacks
- Preparing a road map for improving the overall infrastructure efficiency

Ukraine, Moldova, and Romania were among the largest losers, with the Romanian gear operator, Transgaz, even reporting a 9% year-on-year loss in profits during the primary nine months of 2020 because of this diverted transit.

To meet the four key challenges, regional countries including Ukraine, Moldova, Romania, Bulgaria, Greece, and Turkey must add unison to satisfy mutual interests. The Energy Community, an establishment designed to increase EU rules to neighbouring markets, has already recognized the importance of integrating this region.

The integration refers to the physical infrastructure that may allow gas to flow freely and flexibly across the region. Although the region benefits from two new transmission routes, Turk-Stream 1 and a couple of together with the Southern Gas Corridor, neither can satisfy its integration needs.

Part of the vital infrastructure that would facilitate market integration and satisfy the interests of individual countries is the Trans-Balkan pipeline. The Trans-Balkan Pipeline, also known as the TBP or the Trans-Balkan Oil Pipeline, is a network of pipelines that transport crude oil from the Black Sea region to destinations in Europe, primarily in the Balkans and Central Europe. It plays a crucial role in the transportation of oil from countries such as Russia and Kazakhstan to European markets. It is located near most Turkish LNG terminals. It also has enough capacity to serve the whole region at transit fees that might be significantly reduced.

10. Conclusions

In conclusion. Energy is at the core of sustainable development. Energy security strategies are needed factoring in the specifics of the different parts of Europe. These strategies should be geared toward balancing economic development with environmental sustainability, while respecting social values.

The effective energy infrastructure could become the backbone of a well-supplied integrated region. All it takes is for individual countries to think beyond national interests, acknowledge shared challenges and goals, and unite along similar rules (Sabadus, 2020).

Currently, the transition towards a carbon-neutral society will be a polarizing topic and sometimes benefits already privileged citizens. This example makes the energy market during this part of Europe very difficult to create a prognosis on its concerning midterm trends. Additionally, to any or all this is often the actual fact that there are existing challenges across the region like aged infrastructure, high energy intensity, low energy efficiency, untapped energy potential and poorly functioning regional energy markets.

Moreover, rising inequalities create boundaries between European citizens and hinder the sensation of ownership over environmental and carbon-neutral policies. The rising energy prices tend to cause an inflation spur in the Eastern European countries that coincides with the EU push towards de-carbonization and as a result, the citizens in these countries suffer hugely. Some governments are starting to rethink the option of utilizing nuclear power technologies to help maintain the balance between the environment and social and economic justice.

Energy prices are proven to spur inflation being it on a temporary basis. The effort for synergy in the energy strategies of the countries in Eastern Europe that share similar challenges is very worthwhile.

The energy market dynamics of Eastern Europe are influenced by a combination of factors:

- Geopolitics. Dependency on Russian Energy. Many Eastern European countries historically have been heavily reliant on Russian energy imports, particularly natural gas and oil. This dependence on a single supplier, namely Russia's Gazprom, has raised energy security concerns and made these countries vulnerable to political and price-related disputes. Geopolitical tensions in the region, including conflicts and disputes with neighbouring countries, can impact energy supply routes and pricing. Political factors can sometimes lead to disruptions in energy flows.
- Energy sources. Diversification Efforts: In response to concerns about energy security, Eastern European countries have been working to diversify their energy sources and supply routes. This includes efforts to reduce reliance on Russian gas by seeking alternative suppliers and exploring options like liquefied natural gas (LNG) terminals and interconnectors with neighbouring countries.
- Renewable Energy Growth: Eastern European countries have been increasing their investment in renewable energy sources, such as wind, solar, and biomass. Government incentives, EU directives, and environmental goals have driven the growth of renewables in the region. Eastern European countries have set various renewable energy targets and commitments as part of their efforts to reduce carbon emissions and meet EU renewable energy directives. These targets influence investment in renewables.
- Interconnectivity: Enhancing cross-border energy infrastructure and interconnectivity with neighbouring countries is essential for diversifying supply options and improving

energy market flexibility. Projects such as gas pipelines and electricity interconnectors have been developed to facilitate regional energy trade.

- EU Energy Market Integration: Many Eastern European countries are part of the European Union (EU) or have close ties to the EU's energy market. This integration requires alignment with EU energy policies and regulations, fostering a more competitive and interconnected energy market.
- Nuclear Energy: Several Eastern European countries, including Hungary, Slovakia, and the Czech Republic, rely on nuclear power for a significant portion of their electricity generation. The modernization and expansion of existing nuclear facilities have been under consideration.
- Energy Price Volatility: Energy prices can be subject to volatility due to factors like changes in global oil and gas prices, geopolitical events, and fluctuations in currency exchange rates. This volatility can affect energy costs for both consumers and businesses.
- Regulatory Frameworks: The regulatory frameworks in Eastern European countries play a significant role in shaping the energy market. They govern issues such as energy pricing, market competition, and environmental standards.
- Energy Transition Challenges: Transitioning from fossil fuels to cleaner energy sources can be challenging and costly. Many Eastern European countries face the task of modernizing their energy infrastructure and addressing social and economic implications.

These dynamics in the energy market of Eastern Europe reflect the region's evolving energy landscape, influenced by global energy trends, EU policies, and efforts to enhance energy security and sustainability. It's important to note that specific circumstances and priorities may vary from one country to another within Eastern Europe.

Therefore, the countries from Eastern Europe should put in place national measures and reforms to put forward a package of measures to help protect vulnerable consumers and businesses, which is also compatible with the principles of the Internal Energy Market. These principles include free price formation based on supply and demand in European wholesale energy markets and unhindered cross-border trade between Member States.

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SUMMARIES

Irena Zareva

HUMAN CAPITAL FORMATION IN BULGARIA – LESSONS FROM THE PANDEMIC

The COVID-19 pandemic changed substantially economic and social life globally, causing both a health crisis and a deep recession. It had a significant negative impact on the formation of human capital in both quantitative and qualitative terms and highlighted a number of problems in this area. The purpose of the present study is to highlight and systematise more important effects of the pandemic on the formation of human capital in Bulgaria and to direct attention to problem areas that are a starting point for the development of policies and measures to improve the formation, preservation and development of human capital in the country.
Keywords: human capital; COVID-19
JEL: I20; J11; O15

Hayk Sargsyan, Ruben Gevorgyan

EFFICIENCY OF ELECTRONIC GOVERNMENT SYSTEMS

Digital technologies change common and routine processes and open new opportunities for their optimization. Our research aim was to test the hypothesis about the efficiency of information technology tools in public institutions' management; is the e-government system dependent on the level of information technology development or on the level of institutional development? An empirical analysis of the effects of institutional and technical factors on e-government systems in a sample of 193 countries was provided. Were studied data about the e-government system quality and development; of the institutions, Internet, and telecommunication development as well as statistical information about e-government service websites using. The intensity and efficiency of using e-government systems depend on the mentioned factors. The level of institutional development affects the intensity and effectiveness of the use of e-government systems both directly and indirectly, through a variable characterizing the quality of e-government systems. Advanced information technology factors only indirectly affect the intensity and effectiveness of the use of e-government systems. There is no statistically significant inverse relationship between efficiently and effectively operating e-government systems and variables which characterize the institutions and information technologies development. New rules and procedures in the electronic environment can generally affect the development of state institutions. However, such effects were not detected in our research.
Keywords: government; information technology; digitalization; structural equation models; models with mediation; structural reforms
JEL: D80; G14; O32; O33

Maria V. Melanyina, Elizaveta I. Ruzina, Ludmila V. Shkvarya, Anna Y. Verenikina

DIGITAL TRANSFORMATION IN THE MIDDLE EAST: DIRECTIONS, OUTCOMES AND CHALLENGES

The article is focused on understanding the features of digitalization in the economy of the Middle East countries. Since digitalization has become a global trend, in which countries are being drawn at various speeds and degrees, it is important to understand and systematize the evolution of this process

in different regions. In the Middle Eastern digitalization has been embodied in a number of sectors, industries, productions and activities of the region. This process is unfolding based on existing prerequisites – both regional and global. It is becoming increasingly important for the countries of the region, as it can significantly enhance the resilience of their economies to external challenges. The authors concluded that digitalization in the Middle East lags behind developed countries, but at the same time, is going on the same path as at the global level.
Keywords: Middle East; GCC; Digitalization; Digital Economy; Digital State
JEL: O31; O33; O38

Aifer Baimukhametova, Madina Tulegenova, Zhansaya Temerbulatova, Dinara Rakhmatullayeva

TRANSFORMATION OF INNOVATIVE BUSINESS MODELS THROUGH THE DIGITALIZATION OF THE ECONOMIC SPACE

The relevance of the study is due to the need to determine a business model that meets the modern realities of doing business at the initial stage of building a business. The purpose of the paper is to study approaches to building business models of innovative enterprises and companies in Kazakhstan, taking into account the impact of the global pandemic and digital technologies. The transformation of business models is analyzed on the example of the sphere of innovative entrepreneurship using theoretical methods (analysis; synthesis; concretization; generalization; method of analogies; modelling). As a result, the key criterion that distinguishes innovative entrepreneurship from its classical understanding is formulated and a typical business model of an innovative enterprise was formed.
Keywords: digital economy; transformation; business model; technology; innovative entrepreneurship
JEL: C51; C55; C59

Yllka Ahmeti, Albina Kalimashi, Ardi Ahmeti, Skender Ahmeti

FACTORS AFFECTING SUSTAINABLE GROWTH RATE AND ITS IMPACT ON FINANCIAL PERFORMANCE OF KOSOVO MANUFACTURING COMPANIES

The paper aims to identify the factors affecting the sustainable growth rate of companies over eleven years from 2011 to 2021. The research used panel regression analysis and examined a sample of 92 manufacturing companies operating in the market of Kosovo. This study used a pooled OLS regression model to investigate the variables affecting sustainable growth rate (SGR). According to the research, SGR has a negative significant impact on profitability (ROA), liquidity (LIQ), and equity ratio (TETA). However, there was a positively statistically significant relationship between SGR, asset efficiency (STA), capital structure (TDTE), and sales growth (SG). These findings provide insight into the important factors influencing the study environment's sustainable growth rate. The findings, according to the study, can be used by management to build and implement long-term growth strategies. Businesses can improve their operations, and align them with the objective of sustainable growth by considering the impact of the identified variables. It also provides for a more accurate evaluation of the company's financial success and long-term performance. The study's findings have practical implications for a wide range of stakeholders, including corporate executives, investors, financial institutions, and researchers. All of these groups can use the knowledge provided to make better decisions and support sustainable development rates.
Keywords: Manufacturing Companies; Sustainable Growth Rate; Financial Performance; Kosovo
JEL: N60; O47

Supriatiningsih, Muhamad Taqi, Lia Uzliawati, Munawar Muchlish

DETERMINANTS OF THE TRIANGLE MODEL ON FRAUD FINANCIAL REPORTING WITH INSTITUTIONAL OWNERSHIP AS A MODERATION VARIABLE

The goal of this study is to use the triangle theory to investigate the characteristics that support fraudulent financial reporting. In this study, the dependent variable is false financial reporting, and the independent variables are pressure, which is a proxy for personal financial need and opportunity, which is a proxy for industrial nature, rationalization, and institutional ownership. Because they include numerous units and time periods, the data used fall under the time series and cross sections category. 17 businesses that are included in the 2017-2021 Sri Kehati stock index serve as the sample. The findings demonstrated that Personal Financial Need (OSHIP) had a negative and significant impact on fraudulent financial reporting, whereas the Nature of Industry (REV) had no impact.
Keywords: fraudulent financial report; fraud triangle; institutional ownership
JEL: G32; G02; M1; G34; Z1

Iana Paliova

FISCAL CONSOLIDATION AND GROWTH EFFECTS OF THE EU FUNDING DURING 2021-2027 IN CENTRAL AND EASTERN EUROPE

The study examines fiscal consolidation and growth effects of the EU funding for the program period 2021-2027 in Bulgaria and other EU Member States from Central and Eastern Europe (CEE). It illustrates that gradual fiscal consolidation is implemented, but might be a challenge for some CEE countries, while the growth effects of the EU funding for 2012-2027 will depend on the level of substitution between EU and domestic funding of the EU-related projects. As a result, under the partnership agreements for 2021-2027 and the national recovery and resilience plans the CEE countries are expected to reduce gradually fiscal deficit and debt towards Maastricht criteria, and to increase their annual GDP growth above the baseline scenario between 1% and 4% of GDP, reaching cumulative growth from 9 to 24% of GDP by 2027.
Keywords: Fiscal policy; Fiscal consolidation; European integration; Government policy
JEL: H68; F15; Q57

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POLITICAL SKILL AND TRANSACTIONAL LEADERSHIP ON EMPLOYEE PERFORMANCE: THE MEDIATING EFFECT OF ORGANIZATIONAL WORK CULTURE

Purpose – Previous research has examined political skills and transactional leadership in examining predictors and determinants of employee performance. This study was made necessary by the lack of research on organizational work culture and mediation in the holding industry. This study examines differences in employee performance due to political skills and transactional leadership and examines organizational work culture as a mediating factor. Design/methodology/approach – This study used census sampling techniques. Collect data using questionnaires and analyze research model hypotheses using Confirmatory Factor Analysis and Structural Equation Modeling with SmartPLS. Findings – The data analysis results show that political skills and transactional leadership are not positively related to employee performance and organizational work culture. Organizational work culture also

fails to be a mediator, and only the impact of organizational work culture on employee performance is positive and significant. Practical implications – Organizations must do everything possible to ensure an improved adaptable, collaborative, flexible, and team-oriented work culture within the organization, as this is essential to improving performance by providing motivation, embracing innovative ideas, responding to employee complaints, and enabling the organization to survive and thrive. Originality/value – The study provides insights into how and to what extent political skills and transactional leadership variables affect employee performance. This study complements the existing literature and explores the mediating role of organizational work culture. Executives and policymakers can use the study's findings to improve organizational work culture in the corporate holding industry. The study opens up possibilities for future research.
Keywords: Political Skill; Transactional Leadership; Employee Performance; Organizational Work Culture
JEL: D23; D63; M21; O15; A13

Ahmad A. Toumeh, Maha D. Ayoush

DOES ETHICAL LEADERSHIP CONSTRAINT EARNINGS MANAGEMENT PRACTICES? A SYSTEMATIC LITERATURE REVIEW AND CONTENT ANALYSIS

The study presents a systematic literature review on earnings management and ethical leadership using the content analysis method. Secondary sources of data from academic journals were utilized to address the issue of earnings management. A total of 112 articles, spanning the period from 1977 to 2022, were examined. The study explores the theoretical aspects of earnings management and the conceptualization and operationalization of ethical leadership. The selected articles underwent a systematic review process, and a content analysis was conducted to provide a structured overview of the existing scholarship in this field. Effective ethical leadership plays a crucial role in overseeing and minimizing manipulated earnings. Therefore, this study contributes to the literature by suggesting ethical leadership as a means to mitigate earnings manipulation. This article is distinguished as one of the pioneering works that provides a thorough analysis of the literature on ethical leadership and earnings management. The findings of this study will be valuable to organizations aiming to reduce earnings management practices and improve the quality of financial reporting.
Keywords: Content analysis; discretionary accruals; earnings management; ethical leadership; ethical perspective
JEL: M12; M41; A13

Karolina Sikirinskaya, Elena Ponomarenko

TRANSPORT AND LOGISTICS MARKET TRANSFORMATION: PROSPECTS FOR RUSSIAN-CHINESE INTEGRATION UNDER SANCTIONS RESTRICTIONS

The development of the transport and logistics system in the direction of Russian-Chinese cross-border cooperation is an important direction not only from the point of view of economic prospects, but also from the point of view of political cooperation. The article is devoted to the development and substantiation of proposals for deepening the integration processes of the transport and logistics market of Russia and China. The trends in the development of the world market of transport and logistics services are analyzed with an emphasis on the border regions of Russia and China; identified its key problems and possible directions for their solution to deepen the subsequent integration

between the border regions; an assessment of the effectiveness of the development of the transport infrastructure of the border regions of Russia, as well as the prospects for integrating Russia into the system of world economic relations in the Asia-Pacific region (APR) is given.
Keywords: Transport and logistics market; Transport; Logistics; cross-border cooperation; Integration processes; Sanctions; Russian-Chinese relations; The modern economy of Russia; Development of the Asia-Pacific market; Asian cooperation vector; China
JEL: R12; R41; L92; L98; O18; N75

Sonia Chipeva, Atanas Atanasov, Vania Ivanova

THE GREEN TRANSITION OF SMALL AND MEDIUM BUSINESS IN BULGARIA – CURRENT OVERVIEW AND OUTLOOKS

The conscious need of transition to an environmentally friendly way of society life on a global scale in recent years outlines a new direction in the development and activity of humanity. A number of documents at the global and European levels are a clear sign of countries' determination t change significantly their attitude to the natural resources use in order to limit climate change and global warming of the planet, to ensure an environmentally friendly way of life and activity and the long-term preservation and well-being of human civilization. Small and medium-sized businesses in Bulgaria are a huge potential resource that can be a powerful engine for realizing the ecological transformation of the country's economy.
Current progress, financial ability and access to financial resources as well as the outlooks of small and medium companies in Bulgaria in the green transition are analyzed in this study. SMEs are classified in 3 clusters in terms of their progress in the transition process using TwoStep Cluster analysis with a set of indicators identified by authors. It has been established that despite the existing difficulties and the great inertia in the process of transition to an ecological economy of small and medium-sized companies in particular, more or less sustainable steps leading to the reduction of carbon emissions are observed, in the production of cleaner energy as well as elements of circularity in production processes and consumption. The transition appears to be taking place more quickly in medium-sized companies operating in manufacturing, logistics and transport, while small, mostly family-owned, companies with businesses in retail or service are progressing more slowly in this process. All the companies need of more serious and adequate support in the way of ecologization both by state regulations that to be applied clearly and transparently and by adequate financing
Keywords: green transition; ecologization; small and medium-sized companies funding
JEL: O13; O14; O16; Q01; Q42; Q50; Q56

Nadya Parpulova, Vladimir Zinoviev

NATURAL GAS AND THE DYNAMICS OF THE ENERGY MARKET – EASTERN EUROPE

The paper looks into natural gas as a factor influencing the dynamics of the energy market in Eastern Europe. The energy market as such is in fact the correlation between various interrelated markets which have different effects on the final consumers’ prices and on the inflation. The Eastern European energy market is currently one of the fastest-growing energy markets. It consists of resource-rich and transit countries (Belarus, Bulgaria, Czech Republic, Hungary, Poland, Moldova, Romania, Russia, Slovakia and Ukraine) with a population of roughly 291 million people, that contributes significantly to the world’s energy consumption and security. The dynamics of this market depend on the new infrastructure for transiting and storing natural gas as well as the big undergoing investments in renewable energy infrastructure.
Keywords: energy market; natural gas; inflation; de-carbonization; Eastern Europe
JEL: Q4; R1; V1