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EU CONVERGENCE: A PATHWAY TO ECONOMIC STABILITY

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Abstract: *In the context of global systemic transformations, economic security has become a focal point in political and economic debates. The article explores how economic convergence within the European Union (EU) contributes to strengthening regional economic security. Using an innovative approach based on cluster analysis, the study reveals economic convergence trends among EU member states, highlighting the involvement of this process in promoting economic stability and security in the era of systemic changes. Our methodology involves applying clustering techniques to an extensive set of economic indicators to assess the dynamics of economic convergence between EU countries over the last two decades. The cluster analysis carried out allowed the grouping of countries based on their similar economic characteristics, thus providing a clear picture of the progress towards convergence. The results indicate a strong trend of economic alignment within the EU, with the formation of clusters suggesting a reduction in economic discrepancies. This process of convergence not only reflects greater economic cohesion, but also contributes to the macroeconomic stabilization of the region, an important aspect for economic security in the face of global volatility and uncertainties. The analysis shows that the EU is moving towards uniformity and economic convergence, with economic clusters becoming more similar over time.*

Keywords: *Convergence, Economic security, PCA, Clustering analysis, EU countries*

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Introduction

In the current context of globalization and dynamic challenges, the EU faces major challenges, one of them being the strengthening of economic security.

The article focuses on the convergence of key macroeconomic indicators between member countries and proposes an analysis for this purpose, investigated through the two complementary analytical techniques: principal component analysis (PCA) and clustering. Approaches to economic convergence within the EU require a deep understanding of the

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economic dynamics of the member states, and in this sense, PCA becomes a preliminary step in order to reduce the size of complex economic data sets, allowing the identification of the main factors influencing the economies member states. This method helps to uncover general trends and extract the key factors that define the economic profile of each member country.

After performing the PCA analysis, the next step was the clustering of the identified principal components. This approach allows states to be grouped not only based on raw data, but also based on their fundamental economic characteristics identified through PCA, thus making more nuanced and meaningful comparisons between different economies. This process provides a clearer picture of how member states converge or diverge in terms of economic structure and development priorities. For example, comparing the raw clustering of the data with the clustering derived from PCA shows that certain economies that appear similar on superficial analysis may actually have different economic fundamentals or priorities.

The combined use of PCA analysis followed by cluster analysis provides a comprehensive and detailed overview of economic convergence in the EU. This allows us to observe, beyond the obvious differences between member countries, and understand the complexities that define each country's economy. In this way, we can see potential differences not as obstacles but as opportunities to develop more adaptive and effective economic policies. For example, in the EU, northern member states may have different economic characteristics than those in the south or east, and recognizing these differences is essential for developing economic policies that can stimulate growth in less developed regions while maintaining stability in developed regions.

Therefore, economic convergence is not only an end in itself, but also a means to ensure sustainable economic stability within the EU by reducing inequality and promoting balanced economic growth. The combined use of the two analyses not only improves the accuracy and depth of economic analysis, but also facilitates the development of more precise and coherent policies. This is an important step towards a European economic strategy that recognizes and capitalizes on internal diversity and complexity, ensuring that each member state contributes to and benefits from shared economic growth and long-term stability.

The PCA analysis and subsequent clustering provide a more nuanced picture of economic convergence and highlight the key factors contributing to the internal economic dynamics of the EU. For example, PCA indicates that some countries may be heavily influenced by foreign direct investment and exports, while others are dependent on domestic consumption and government investment.

Analysing economic convergence using these two methodologies, this article provides a framework for understanding how the EU can respond to the changing global system, and economic convergence is not only a goal to be achieved, but also an essential tool for strengthening economic and political cohesion in the facing internal and external challenges. Recognizing economic diversity and adapting policies to this diversity is an essential step in

ensuring the economic security of the EU. This detailed approach to economic convergence analysis can not only understand current dynamics but also predict potential future challenges. In a world where economic change is rapid and often unpredictable, the EU's ability to adapt and respond effectively to these changes will not only determine its economic security, but also its importance on the global stage.

This article highlights the importance of adaptability, innovation and cohesion within the EU, which are essential to remain a successful model in an ever-changing world, and adapting economic policies to national diversity and building on the strengths of each member state will play a key role in ensuring the EU's long-term economic security and prosperity.

Literature review

The specialized literature dealing with PCA analysis and cluster analysis is well represented, the articles published in the journal, of which I will mention a few that addressed the same research topic, contributed to the theoretical foundation of this research, as well as provided a comparative framework. The literature dedicated to the analysis and understanding of their structures has validated their ability to reveal hidden patterns and complex relationships in data sets: PCA, clustering and K-means analysis. These techniques have become reference points in the field of statistics and data science, they allow to reduce the size of the data, identify groups or structure the data to obtain a deeper understanding of the relationships between variables.

Laboutková et al (2016) through the cluster analysis, identified groups of countries based on the level of decentralization and economic inequalities, as well as the fact that among the results obtained there is no direct correlation between decentralization and low levels of economic inequality.

In a similar methodological approach, Onuferová et al (2020) investigated the economic and social evolution of EU member states, using cluster analysis based on five international multicriteria indices. The study classified EU countries into groups, revealing changes in their performance over the period 2011-2018, showing a general trend of improvement, as well as the reduction of economic disparities between EU members.

Živadinović et al (2009) investigated the economic profile of Croatia in relation to the other member states of the EU, cluster analysis and factor analysis on a number of key economic indicators. The study highlighted similarities between Croatia and other countries with similar historical and political contexts based on indicators such as GDP per capita, employment rate and comparative price levels.

Akkucuk (2011) classified countries into groups based on a set of 12 economic variables, with the aim of analyzing the similarities and differences between them in a

multidimensional space. Through this approach, he identified an optimal clustering into five groups, corresponding with existing classifications based on GDP and export structure.

Using multiple development indicators, Tang & Salvador (1986), identified five distinct groups of countries in the Asia-Pacific region. Their study highlights the importance of a multidimensional approach to development assessment and planning, demonstrating that the use of a varied set of indicators can provide a more complete picture of the development stage of different countries.

On the other hand, Vichi and Kiers (2001) introduce an innovative model that combines k-means clustering analysis with factor analysis for two-way data. This methodology, called k-means factor analysis, simultaneously aims to reduce and synthesize data, both object-wise and variable-wise, and allows a more precise selection of variables in the clustering process. The proposed methodology represents a superior alternative to the sequential approach, demonstrating the effectiveness of the alternative iterative algorithm in minimizing the distances between data points and centroids, thus allowing more accurate classification of objects within datasets.

The methodology used in this study combines advanced statistical techniques to effectively and objectively approach such datasets. By using PCA, cluster analysis, K-means method, dendrograms and biplot graphic analysis, they propose a comprehensive approach that allows not only to simplify and reduce the complexity of the data, but also to discover significant structures and relationships between the studied variables.

The purpose of this methodology is to provide a robust framework for data analysis, thereby improving the ability to interpret and make data-driven decisions. In the following sections, we will detail each component of this methodology and illustrate how these techniques can complement each other to provide deeper and more detailed insight into the data being analysed. PCA is a statistical technique used to reduce the size of data while retaining as much variation as possible. PCA transforms the original set of variables into a new set of orthogonal variables, called principal components, which are linear combinations of the original variables. The first principal components capture most of the total variation in the data, Jolliffe (2002). A PCA plot is a graphical representation used to visualize data in the context of a principal component analysis. In a standard PCA plot, the data is plotted on the first two principal components, which are linear combinations of the original variables and capture most of the variation in the data set. Each point on the plot represents an observation from the data set. The position of a point indicates the values of that observation on the two principal components. Thus, the chart can show groupings or patterns within the data.

Cluster analysis is a method of classifying objects into groups so that objects in the same group (or cluster) are more closely related to each other than to those in other groups. This methodology is used to discover hidden structures in data and can be applied through various techniques such as hierarchical methods and partitioning methods, Everitt et al. (2001).

The K-means method is a partitioning clustering technique that divides a data set into k clusters, minimizing the variation within clusters and maximizing the variation between clusters. This involves initially choosing k centroids and assigning each object to the nearest centroid, followed by recomputing the centroids until convergence, MacQueen (1967).

A dendrogram is a visual representation used in hierarchical cluster analysis to show the arrangement of groups and the relationships between them. This tree diagram shows how each cluster is divided into smaller clusters down to the individual object level, Sneath and Sokal (1973).

In conclusion, in the chapter dedicated to the specialty literature, we identified and analysed the significant contributions in the field, establishing the context for the present research. This synthesis of previous studies brought new approaches into view, providing clear directions for the present analysis. Thus, the literature review built a solid foundation in the methodology approach that was the basis of this article.

Data and Methodology

Analysing economic security through the prism of economic convergence within the EU-27 countries from 2000-2021, we approach the complexity of the relationships between economic indicators with the help of PCA and clustering techniques, respectively K-Means and Silhouette analysis, as well as the Index Hubert, which is a graphical method for determining the number of clusters. The latter method was used to further verify the robustness of the cluster structure.

Economic convergence, manifested through similar development directions of the member countries, represents an essential factor for the general economic security of the EU. This reflects an increased level of economic stability and predictability, contributing to the economic cohesion and resilience of the European bloc.

The analysis of economic indicators allows the identification of convergence patterns between the EU-27 countries. These patterns, interpreted through the lens of economic security, provide valuable information on the solidity of the Union's economic foundation. Our study contributes to an in-depth understanding of the complex interactions between various national economic aspects, providing insight into sustainable economic cohesion and stability at EU-27 level.

The process of data cleaning and normalization is very important in any analysis, it prepares the necessary framework for an accurate interpretation of the PCA, which reveals how various economic indicators such as GDP per capita, inflation, unemployment rate or public debt differ, which contributes to shaping the convergence between these EU-27 states. This standardization process is essential for the comparability of economic indicators, ensuring a correct analysis of the dynamics of economic convergence in the EU-27.

PCA is an advanced statistical method used to simplify the complexity of multidimensional data sets that identifies directions (or principal components). This technique is useful in the context of the analysis of economic convergence between the EU-27 countries, as it allows reducing the dimensionality of the data without losing significant information about their economic structure.

The process of PCA begins by exploring and understanding the data by calculating the covariance matrix (C). This matrix reveals how the variables in the data set vary together and helps us identify underlying relationships and patterns in the data.

$$C = \frac{1}{n-1} (X - \bar{X})^T (X - \bar{X}) \quad (1)$$

Where:

n - the number of observations

X - the initial data matrix

\bar{X} - the vector of means of each variable

After the calculation of the covariance matrix, the identification of the eigenvalues (λ_i) and the eigenvectors (v_i). These are calculated from the covariance matrix and are essential for determining the principal components of the data. The formulas for the eigenvalues and vectors are:

$$Cv_i = \lambda_i v_i \quad (2)$$

Where:

Cv_i - the vector resulting from the multiplication of the covariance matrix by a specific eigenvector

λ_i - own values

v_i - the eigenvectors

The clustering approach using PCA-derived principal component scores on economic indicators, and not directly on countries, requires a specific reinterpretation. In this context, each economic indicator becomes an "object" to be grouped according to their similarity in the space of principal components, reflecting how different indicators contribute to the overall economic structure of the EU-27. The goal is to identify groups (or clusters) of indicators that have similar behaviors, suggesting areas of economic convergence that can influence economic security. In this direction, we used K-means and the Elbow and Silhouette clustering methods. To assess the quality of the clustering we applied the Hubert indices as an additional check of the robustness of the cluster structure, providing an additional assessment of the quality and relevance of the identified groups. This sequential methodological process allows us to strengthen confidence in the results of our analysis, ensuring that our interpretations are well-founded and adequately reflect the dynamics of economic convergence between EU-27 countries.

By applying K-Means to the scores of the main components of the economic indicators, it is aimed to group them into clusters based on their similarity in the reduced dimensional space given by PCA. Each economic indicator is represented by a point in the space of principal components, and the K-Means algorithm tries to minimize the internal variation of the clusters. The objective is formalized as minimizing the sum of the squared distances between the indicators in each cluster and its centre:

$$J = \sum_{k=1}^K \sum_{i \in C_k} \|x_i - \mu_k\|^2 \quad (3)$$

Where:

J - the sum of the squared distances to be minimized by the K-Means algorithm

K - the predefined number of clusters

C_k - the set of economic indicators (or observations) in the cluster K.

X_i - is the vector of PCA scores for the economic indicator i which represents the data associated with each indicator in the reduced principal components space.

μ_k - the centre of cluster k, calculated as the average of the vectors of PCA scores for all indicators in C_k

By $\|x_i - \mu_k\|^2$ the squared distance between each economic indicator x_i and the center of its cluster μ_k , and the algorithm tries to minimize this sum by adjusting the clusters. This minimization ensures that each economic indicator is assigned to the cluster with which it has the greatest similarity, according to the distance in the space of the principal components, which leads to as homogeneous and well-defined groups as possible.

To decide how many clusters to form, we used the Elbow method, the principle behind this method is to run the clustering algorithm (K-Means in our case) for a range of K values (the number of clusters) and to calculate the sum of squared distances (SSE - Sum of Squared Errors) between points and their cluster centre. The plot of SSE versus K is then examined to identify the point at which increasing K no longer leads to a significant improvement in SSE - this point is often compared to the "elbow" of an arm, hence the name of the method. The Elbow method is useful to provide intuitive guidance in choosing an appropriate number of clusters.

The Silhouette analysis is also a valuable method in evaluating clustering results, providing a quantitative measure of the quality of the classification of each economic indicator within the formed clusters. This silhouette score helps to understand how well each indicator was placed in its cluster, compared to other clusters. The silhouette score ranges from -1 to +1, where:

A score close to +1 indicates that the indicator is very close to the other indicators in its cluster and far from the indicators in the other clusters, suggesting an appropriate classification.

A score close to 0 suggests that the indicator is on the border between two clusters, being almost as close to the nearest different cluster as to its own cluster.

A score close to -1 indicates that the indicator was erroneously placed, being closer to indicators in another cluster than to those in its own cluster. Calculating the average silhouette score for all economic indicators in a data set provides an overall measure of clustering quality.

A mean score closer to +1 suggests that the clustering was mostly adequate, with well-defined and separated clusters. On the other hand, a mean score close to 0 or negative indicates a poor classification with many overlaps between clusters.

The Hubert Index (Gamma) and the D Index (Davies-Bouldin) are specific measures in evaluating the quality of a clustering, helping to determine the optimal number of clusters in the data set. These methods are based on the calculation of statistics that measure the internal cohesion of clusters and the separation between them, providing a quantitative insight into the structure of the clusters formed.

The Hubert index, also known as the Gamma coefficient, is a measure of statistical association between pairs of variables. In the context of clustering, it is used to evaluate how well the separation between clusters is defined. On the other hand, the D(Davies-Bouldin) Index is another measure used to evaluate the clustering quality. The D-index seeks to minimize the internal similarity of clusters and maximize the separation between them

Both Hubert (Gamma) and D indices provide valuable insights into the quality of clustering solutions, helping to identify the clustering structure that best balances internal cohesion and separation between clusters.

By applying PCA techniques and clustering methods, this study addresses aspects of economic convergence in the EU-27, emphasizing objective and quantitative analysis. Through this approach, the study brings to the fore the way in which different economic indicators interact and contribute to the patterns of economic convergence between the EU-27 member states. This methodological approach allows us to obtain a clear and quantifiable picture of economic relations, thus providing a solid basis for understanding economic security within the Union. Therefore, this study can bring more knowledge to the existing literature to support the development of good economic policies substantiated, which promote greater integration and economic security throughout the EU.

Case study

In this chapter, we will detail the applied analytical process and present the results obtained within the chosen case study. The analysis will begin by examining the data, thereby establishing a framework for interpretation and discussion. We will start with descriptive statistics to get to know the data, we will continue with PCA analysis, cluster analysis, as well as the presentation and interpretation of their results, together with the dendrograms and plots determined by the analyses.

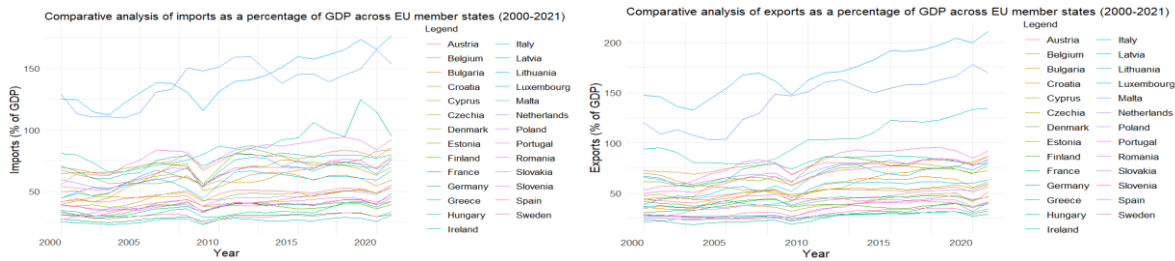


Figure 1. Graphic presentation of the export/import comparative analysis

Source: Eurostat. The data was processed by the author with statistical software R

The graph (Figure 1) reflects the complexity and dynamics of foreign trade within the EU, highlighting the different economic trajectories of the member states in the context of globalization and world economic changes, as well as the complexity and dynamics of international trade relations. Reflecting both the opportunities and challenges of globalization, the data underscore the importance of economic adaptability and resilience in the face of rapid changes in the global marketplace.

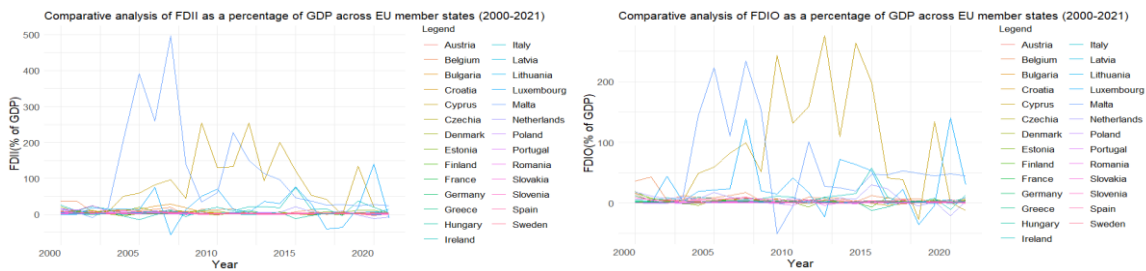


Figure 2. Graphic presentation of the FDI (foreign direct investment inflow)/FDIO (foreign direct investment outflow) comparative analysis

Source: World Bank. The data was processed by the author with statistical software R

Figure 2 illustrates the evolution of foreign direct investment inflow and outflow (FDII & FDIO) as a percentage of GDP between the years 2000 and 2021. This comparative analysis highlights how foreign direct investment flows have changed over time, reflecting trends, economic shocks and investment policies in various countries.

The observed volatility reflects the adaptability and reaction to global market dynamics, as well as the impact of major economic events. The diversity of performance among EU countries underlines the importance of national policies and economic capacities in shaping foreign investment strategies. The evolution of this indicator provides a valuable perspective on the international economic integration of and on how states participate in global markets.

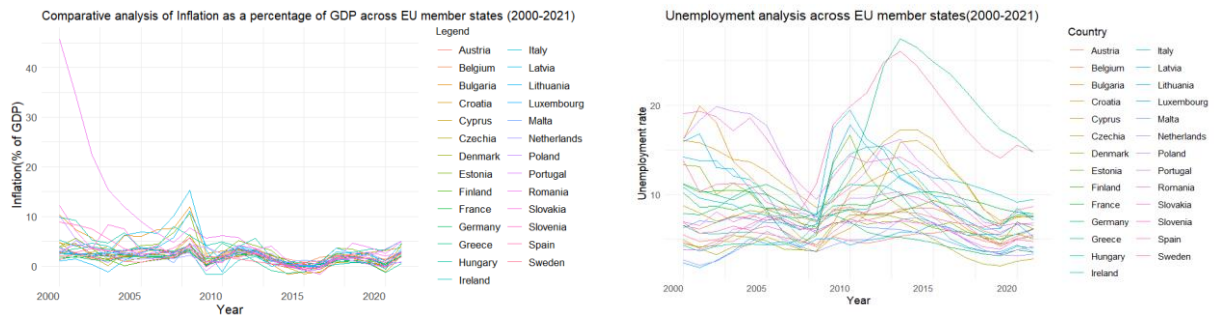


Figure 3. Graphic presentation of the inflation & unemployment comparative analysis

Source: Eurostat. The data was processed by the author with statistical software R

The evolution of inflation and the unemployment (Figure 3) rate in the EU between 2000 and 2021 highlights how these economic indicators have changed in the context of major events such as the global financial crisis and the COVID-19 pandemic. The data generally show a stability and moderation of inflation, which suggests the success of the monetary policies implemented by the European Central Bank and national banks. However, inflation rates have seen increases during periods of crisis, illustrating the impact of global events on price stability. In parallel, the unemployment rate has shown significant fluctuations, with increases during recessions, reflecting the sensitivity of the labor market to economic and policy changes. Variations between EU countries in unemployment reflect differences in economic structures and the effectiveness of employment policies.

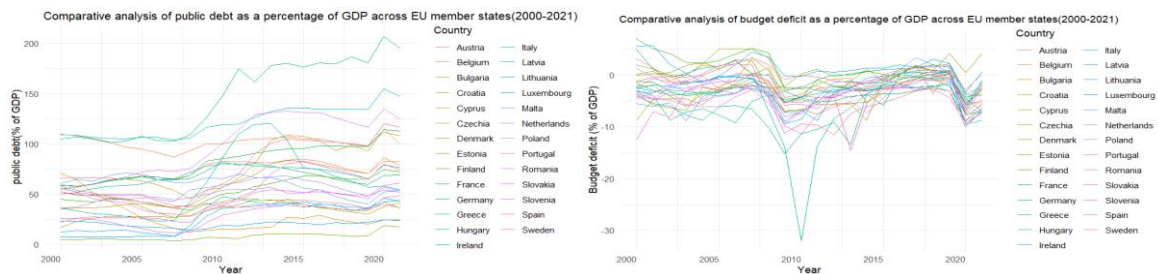


Figure 4. Graphic presentation of the public debt & budget deficit comparative analysis

Source: Eurostat. The data was processed by the author with statistical software R

The graph analysed (Figure 4) provides a perspective on the evolution of the budget deficit and public debt in the member states of the EU between the years 2000 and 2021, highlighting the impact of economic fluctuations on the fiscal health of nations. Significant increases in the budget deficit are noted following major economic crises, such as the global financial crisis and the COVID-19 pandemic, when governments actively intervened through fiscal stimulus and spending measures to mitigate the effects of recessions.

The analysis highlights the challenges of fiscal management in the context of an unstable global economy and shows how periods of crisis call for decisive fiscal action, while phases of economic stability provide a window for fiscal consolidation. We also see significant

differences between EU states in public debt levels, with some countries recording substantial debt-to-GDP ratios, reflecting diverse national fiscal approaches and challenges. This analysis highlights the importance of prudent management and sustainable fiscal policies to maintain economic stability in the face of external uncertainties and shocks.

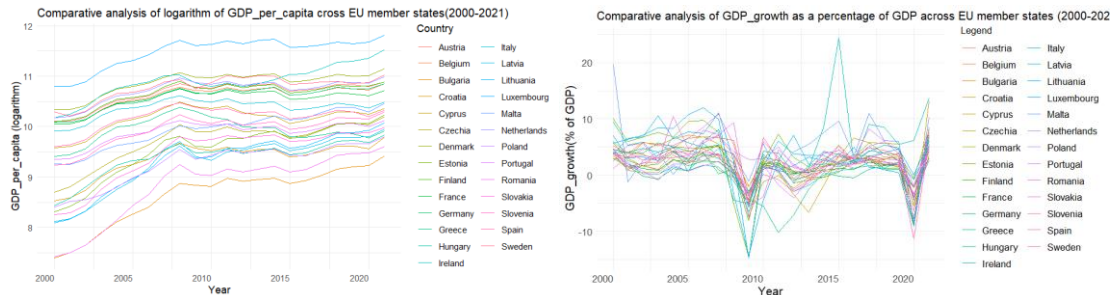


Figure 5. Graphic presentation of the GDP/capita & GDP growth comparative analysis

Source: Eurostat. The data was processed by the author with statistical software R

The graph (Figure 5) analyses the evolution of GDP per capita between the years 2000 and 2021 in the member countries of the EU, highlighting a general growth trend that indicates an improvement in living standards and prosperity. Significant variations are observed between countries, illustrating the different economic trajectories and degree of development. Slowdowns related to major economic crises, such as the 2008-2009 crisis and the COVID-19 pandemic, mark moments of vulnerability and temporary declines in economic growth. Also, a process of income convergence between member states is highlighted, in line with the EU's objectives of economic and social cohesion. The chart also reflects business cycles, with periods of expansion and contraction, highlighting how economies are affected by external and internal shocks. By illustrating these trends, the chart underlines the importance of economic policy and crisis management in promoting sustainable growth and economic stability at EU level. This highlights the complexity and challenges of managing growth in a diversified and interconnected European context.

Interpreting economic indicators in the context of convergence in the period 2000-2021, we note that the convergence process is a complex one, with uneven progress between different fields. They reveal a picture, with real and nominal convergence trends in areas such as inflation and GDP per capita, but divergence in fiscal management and labour market dynamics. This picture highlights the fact that, although European integration has advanced, the process of economic convergence remains uneven and requires continuous and coordinated efforts to address disparities and promote deeper economic convergence among member states.

Thus, economic convergence in the EU proves to be a dynamic, evolving process that requires an adaptive approach and effective policy responses, taking into account the changing global economic climate. The sustainability of this process will depend on the EU's ability to

promote economic policies that aim not only at stability and economic growth, but also at equity and inclusion, thus ensuring shared prosperity across the Union.

To achieve the research objectives, we will analyse the PCA biplot for the year 2000 (Figure 6), which combines the loadings of the economic indicators with the positioning of the EU countries and which provides a valuable insight into the economic structure and relations between the different countries of the EU. This analysis allows the simultaneous evaluation of the influence of economic indicators and the economic performance of the member countries.

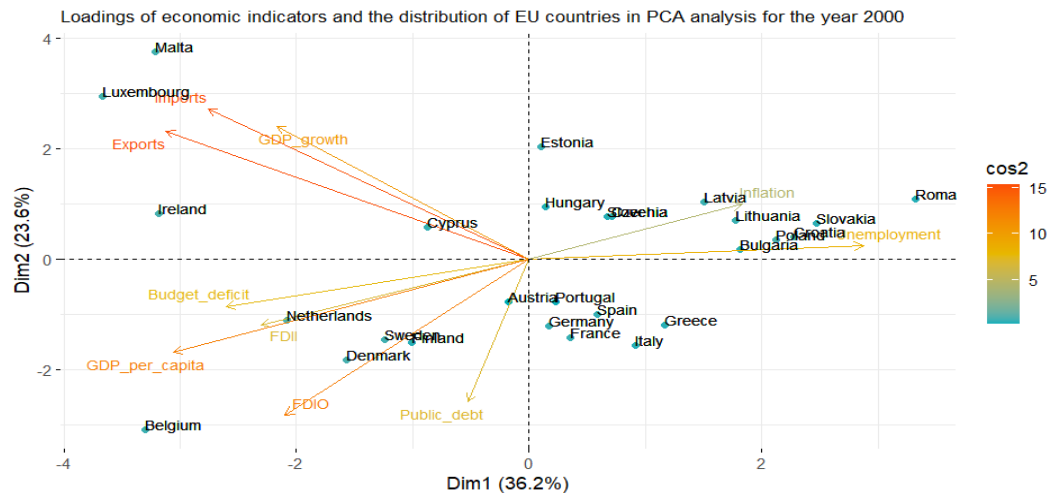


Figure 6. Loadings of economic indicators and countries in PCA analysis – year 2000

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

The analysis of each quadrant separately reveals very interesting associations between the loadings of the economic indicators and the countries under analysis. We will analyse and interpret each quadrant separately, then issue a conclusion following these analyses.

In quadrant I (top right) countries such as Estonia, Latvia and Lithuania, Romania or Bulgaria can be observed, alongside economic indicators such as the inflation rate and unemployment. This suggests that in 2000 they were facing challenges specific to the post-communist transition, such as macroeconomic adjustments needed for stabilization. The transition to market economies, structural reforms and EU integration efforts have created pressures on the labour market and led to high levels of inflation. This association of countries and indicators reflects not only the post-communist transition, but also the process of European integration at different stages for these countries. Positioning in this quadrant underlines the fact that, despite the economic challenges associated with the transition and preparation for EU accession, the countries of Central and Eastern Europe have been engaged in an active process of reform and adaptation. Pressures on the labour market and inflation reflected not only the difficulties of the transition, but also the progress towards stabilization and European integration.

Quadrant II (upper left) clearly reflected that the countries placed here are outward-looking economies, indicating a strong orientation towards open economies with significant reliance on international trade and external economic performance. These countries appear to be benefiting from globalization and European integration, with export-oriented economies driving GDP growth. Their presence in this quadrant reflects a successful adaptation to the globalized economy, with an emphasis on export-oriented sectors that drive economic growth. These countries demonstrate that small but open and flexible economies can achieve high economic performance. These, through the success they had, managed to capitalize on niches and specific economic sectors, benefited from a competitive advantage on the single European market, but also at the global level.

In quadrant III (bottom left) we see countries such as Belgium, Sweden, Finland or Denmark, together with indicators such as public debt and budget deficit. The combination of these countries and indicators suggests mature economies with complex fiscal systems facing the challenges of managing public debt and budget deficits. The positioning of these countries in this quadrant suggests continued concern for macroeconomic balances and the need for prudent debt and deficit management policies, essential for long-term economic stability.

Foreign investment flows, both inward and outward, suggest that these countries have been active as both recipients and sources of FDI. The length of the vectors of these indicators indicates the significant importance of foreign investment in their economies, both in attracting foreign capital and in their companies' investments abroad. The existence of capital flows alongside the concerns related to public debt and the budget deficit, highlights the complexity of fiscal policy management in a globalized context. This underlines the importance of fiscal policy not only in domestic terms but also in its relationship with international capital flows. This situation illustrates the principles of the Mundell-Fleming model, which extends the IS-LM model to the open economy, showing the interplay between fiscal policy, exchange rates, and capital flows.

In conclusion, this quadrant provides a complex perspective on the challenges and strategies of the EU's mature economies in the year 2000.

The absence of indicators in quadrant IV (bottom right) may indicate that there is no clear trend or dominant economic theme associating direct economic growth with specific negative aspects, in the context of the analysis for the year 2000. The absence of indicators in this quadrant indicates that, in the year 2000, although there were no dominant trends, each faced its own economic challenges at the turn of the millennium. For example, Italy and Portugal were facing increased public debt, while Spain and Greece were beginning to face budget deficit problems that would become more acute over the next decade.

In conclusion, the positioning of Austria, Germany, Greece, France, Italy, Spain and Portugal in the IV quadrant reflects the characteristics of mature and integrated economies,

which, in the year 2000, were not marked by extremes in economic performance in relation to the indicators selected for PCA analysis.

In conclusion, the PCA analysis (Figure 6) for the year 2000 reflects the diversity of development stages and economic challenges facing EU countries at the beginning of the millennium. CEE countries, at various stages of EU integration, are showing signs of adapting to the Union's economic criteria, despite initial challenges. This diversity underlines the complexity of the economic convergence process and the importance of political adaptation to the specific context of each country. The EU accession process provided a framework for economic and political reforms that stimulated macroeconomic stability and economic growth. Despite the challenges, the progress made by the CEE countries indicates a positive trend of convergence towards EU economic and social standards, underlining the Union's ability to support the development and integration of its members.

The joint PCA indicator/country chart for the year 2000 provides a valuable insight into the economic complexity and diversity within the EU, while highlighting the challenges and opportunities associated with economic integration and convergence. The review reiterates the need for a balanced and coordinated approach to economic policies and development strategies to promote stability, growth and cohesion in the EU.

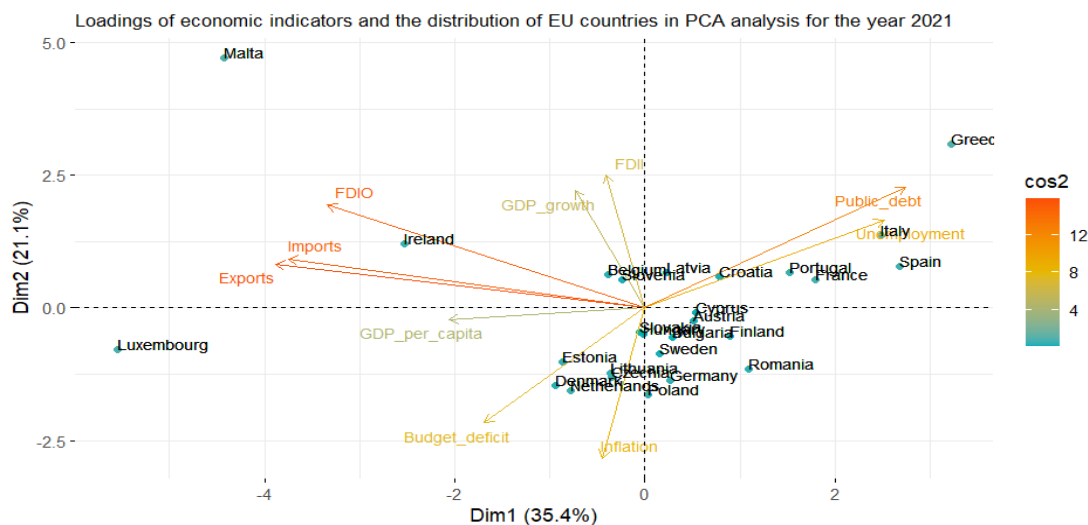


Figure 6. Loadings of economic indicators and countries in PCA analysis – year 2000

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

Regarding the analysis for the year 2021 (Figure 6), we can note that countries such as Greece, Italy or Spain are placed in quadrant I (top right) close to indicators such as public debt and unemployment, which suggests that the challenges associated with debt and the labour market are relevant to these economies. This may reflect the continuing impact of previous economic crises and fiscal and social sustainability challenges. The presence of these countries near the public debt and unemployment indicators highlights a common set of economic

challenges, including the long-term impact of financial and debt crises, labour market difficulties and fiscal sustainability challenges. This indicates that despite their geographic diversity and differences in economic structure, these nations face similar problems in managing public finances and the labour market.

Geographically, countries such as Greece and Spain have been deeply affected by the European sovereign debt crisis and have implemented extensive austerity programs and economic reforms. Public debt and unemployment problems reflect the difficulties of economic recovery and structural adjustment. In CEE, although not as affected by the sovereign debt crisis as the southern countries, these states face their own challenges related to fiscal sustainability and labour market structure, partly resulting from the post-communist transition and EU integration. On the other hand, France, as part of the western core of the EU, demonstrates that public debt and unemployment challenges are not limited to the periphery of the Union, but also affect larger, developed economies struggling with structural rigidities and fiscal pressures.

This geographical diversity in Quadrant I underlines that, despite different economic contexts and histories, EU countries share common challenges related to managing public debt and unemployment. This highlights the importance of European solidarity and coordinated policies to address these challenges. The common presence of these challenges may indicate a form of real convergence, in the sense that countries face similar problems at their respective stages of development and European integration. This suggests that, regardless of economic and historical diversity, EU economies tend to experience common challenges, which require coordinated solutions and adaptive policies.

However, the presence of these common challenges could also suggest areas of divergence, particularly if the pace of recovery and the ability to respond to these challenges differ significantly between countries. The divergence could become apparent if some countries manage to overcome their public debt and unemployment problems more quickly, while others lag behind.

Ireland and Malta, part of Quadrant II (top left) alongside exports, FDII, FDIO and GDP growth, indicate strongly outward-oriented economies as well as the benefits of integration into the global economy. Significant arrows (loadings) for FDIO and FDII indicate deep integration into the global economy through foreign investment. The size of the arrows suggests a considerable influence of direct investment flows on the economies of these countries. This may reflect attractive investment policies and a favorable business environment. In the same vein, the considerable size of the arrows for exports and imports underscores the heavy dependence of these economies on international trade. This highlights the competitiveness of their export sectors and the need for imports to support domestic production and consumption. Concluding the above, we can state that the length of the arrow associated with GDP growth illustrates the direct impact of international trade and foreign direct

investment on economic growth. This suggests that external economic strategies contribute significantly to overall economic performance.

This quadrant highlights how economic integration, trade openness and policies attractive to foreign direct investment play a very important role in promoting economic growth. In conclusion, the success of countries in this quadrant demonstrates the value of European integration and international cooperation in boosting economic performance in a globalized environment.

Looking at quadrant III (bottom left) of the 2021 CPA analysis, which includes Luxembourg, Estonia, Denmark, the Netherlands and Lithuania, close to the intersection of the axes, and focusing on economic indicators such as inflation, GDP per capita and budget deficit, we can say that the mentioned countries are effectively managing inflationary pressures, maintaining inflation rates that do not deviate significantly from the average, which indicates a balanced monetary and fiscal policy. On the other hand, the significant size of GDP/capita for Luxembourg and the proximity for the other countries highlight the high levels of income per capita, indicating general economic well-being and a higher quality of life.

The presence of the budget deficit highlights fiscal challenges, but the positioning close to the intersection axis for some countries suggests that they are managing to keep the budget deficit within manageable limits, reflecting fiscal prudence and sustainability in the medium to long term.

Placing these countries in the same quadrant, given the diverse economic context of the EU, may also reflect a form of convergence in terms of economic stability and sustainability. This could suggest that, despite the structural and economic diversity, the political and economic coordination mechanisms of the EU contribute to the promotion of common principles of stability and sustainable economic growth among states.

The lack of indicators in quadrant IV suggests a concentrated distribution of countries around other major axes of economic interest in the PCA analysis.

Understanding the positioning of a group of countries such as Romania, Poland, Denmark, Sweden, Finland, Slovakia, Cyprus, Austria and Germany in the PCA analysis for the year 2021, with all being placed between the values specified on dimensions 1 and 2, suggests a distinct economic profile for these countries within the EU. This placement indicates economic characteristics and performance that are worth exploring in detail. Countries' placement near 0 and towards 1 on this dimension suggests economic performance that is less negatively influenced by the predominant factors captured in this principal component. These countries may have relatively balanced and stable economies with good management of the main macroeconomic challenges, which allows them to avoid extremes on both dimensions of the PCA analysis.

Economies such as those of the Nordic countries (Sweden, Finland, Denmark) are known for innovation and a high level of social and economic development, which could contribute to

their distinct placement in the analysis. Germany and Austria, as major EU economies, alongside developing countries such as Romania and Poland, illustrate resilience and adaptability, reflecting a combination of sustainable economic growth and macroeconomic stability.

The placement of these countries in a relatively compact and specific area of the PCA diagram could indicate aspects of economic convergence within the EU, especially in terms of balanced management of the economy and the promotion of innovation and sustainable growth. This suggests that although there are differences between member countries' economies, there are also common features that can serve as a basis for cooperation and common policies in the EU.

In conclusion, the PCA analysis for the year 2021 illustrates the complex relationships between economic indicators and the performance of EU countries, highlighting the impact of economic integration, globalization and domestic economic policies on different dimensions of economic performance. We see a diversity of economic trajectories among EU countries, from those facing fiscal and labour market challenges, to economies that are strongly outward-looking and benefiting from integration into the global economy. This underlines the importance of continued structural reforms, economic policy adaptability and European cooperation to address economic disparities and promote sustainable and inclusive growth.

The next analysis, regarding the progress of convergence, we will perform the cluster analysis with visualization through the related dendrograms of the years 2000 and 2021.

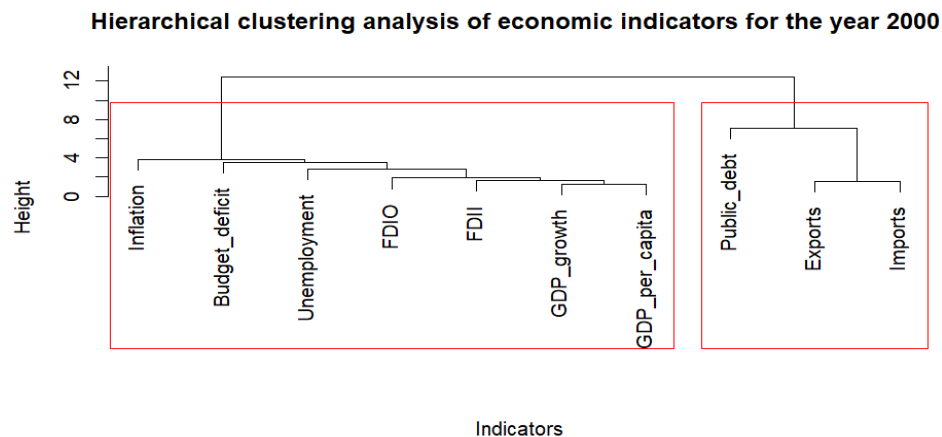


Figure 7. Dendrogram after cluster analysis for the year 2000

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

The dendrogram analysis for the year 2000 (Figure 7) reflects an economic structure where domestic policy (reflected by inflation, unemployment, GDP and foreign investment) and external performance (represented by the trade balance and public debt) form two major axes of analysis. In the context of economic convergence, this model suggests that there are two main directions in which countries can work to improve economic

performance: internally (by stimulating economic growth and attracting investment) and externally (by optimizing trade and managing debt).

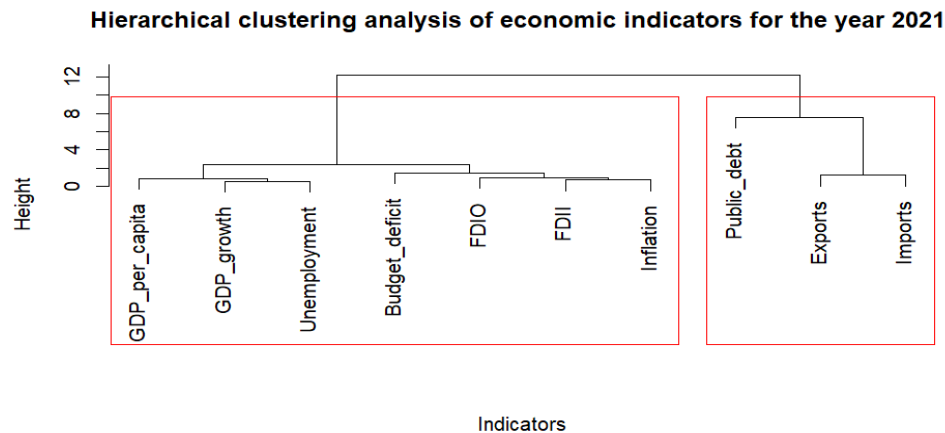


Figure 8. Dendrogram after cluster analysis for the year 2021

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

The dendrogram of 2021 (Figure 8) confirms the trends towards greater global economic integration and the importance of balanced management of external and internal relations. Indicators show that a holistic approach, combining economic stimulation (through growth and investment) with fiscal prudence (reflected in debt management and inflation), is essential to ensure sustainable economic convergence.

Following the analysis of the dendrograms, it can be seen that the years 2000 and 2021 present a common cluster with the same indicators, while the other cluster differs in the associations between the indicators. This segmentation is interesting and may at first seem counterintuitive in the context of a discussion of economic convergence. This phenomenon can be interpreted by the complexity and dynamics of the global economy, as well as by the way economic indicators interact with each other during different economic cycles and stages of development.

The analysis of the dendrograms from 2000 and 2021 illustrates an evolution of the economic structure, marking a transition from more simplified to more complex and interconnected segmentations. This highlights the impact of globalization, the very important role of foreign investment and the need for prudent management of public finances. Prospects for economic convergence should take into account these complex dynamics, balancing economic stimulus with fiscal and trade sustainability to move forward effectively in an ever-changing global environment.

The next step in the analysis is to interpret the PCA results to identify the directions in which the data show the most variation, and how each indicator contributes to these directions.

Table 1. PCA of EU Economic Indicators - year 2000

Indicators	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Exports	-0.404	0.370	0.080	-0.036	-0.051	-0.236	-0.411	0.051	-0.044	-0.679
Imports	-0.357	0.433	0.194	0.013	-0.100	-0.183	-0.266	0.086	0.208	0.695
FDII	-0.298	-0.190	0.559	-0.298	0.280	-0.167	0.221	-0.485	-0.286	0.041
FDIO	-0.271	-0.452	0.176	-0.231	0.294	-0.010	0.003	0.655	0.346	-0.046
GDP_growth	-0.280	0.384	0.203	0.210	0.074	0.663	0.429	0.198	-0.116	-0.084
Inflation	0.237	0.158	0.050	-0.775	-0.240	0.273	-0.182	0.207	-0.322	0.062
Unemployment	0.372	0.038	0.307	0.333	0.501	0.058	-0.457	0.201	-0.383	0.077
Public_debt	-0.068	-0.413	0.408	0.227	-0.557	0.367	-0.364	-0.140	0.100	-0.031
Budget_deficit	-0.337	-0.137	-0.472	-0.130	0.384	0.453	-0.390	-0.335	0.047	0.099
GDP_per_capita	-0.395	-0.269	-0.291	0.179	-0.228	-0.162	0.043	0.268	-0.691	0.157

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

The analysis of the main components for the year 2000 (Table 1) shows us a perspective on the data structure of the economic indicators, identifying the directions in which the data show the greatest variation (the main components) and how each indicator contributes to these directions. PC1 and PC2 together account for almost 60% of the total variation in the data, with 36.22% for PC1 and 23.56% for PC2. This suggests that these two components capture a significant portion of the information in the data set. PC3 and PC4 add another 11.57% and 10.41%, reaching almost 82% of the explained variation.

Later components (PC5 - PC10) have smaller contributions, indicating that most of the useful information can be effectively represented by the first four components.

PC1 is negatively influenced by indicators that refer to external economic performance (exports, imports, FDII, FDIO, GDP/capita) and positively by inflation and unemployment. This suggests that PC1 might represent a dimension of internal versus external economic performance and provides insight into the duality between internal and external aspects of the economy. This configuration suggests that PC1 captures the contrast between a country's domestic economic health and external commitments. On the one hand, a high value of this component indicates an economy with higher unemployment and inflation, suggesting potential domestic challenges such as weak domestic demand, cost pressures or labour market inefficiencies. On the other hand, the negative contributions from exports, imports, foreign direct investment and per capita underline the importance and impact of external economic interactions.

PC2 shows mixed contributions, with imports and GDP growth having positive influences, while FDIO and public debt are negative. This could indicate a dimension related to external versus internal financial balances. This principal component, which presents a mixture of positive influences from imports and GDP growth, negative influences from the foreign direct investment portfolio and public debt, provides insight into the dynamics between an economy's external and internal financial balances. This suggests that PC2 may reflect a tension

between the economic stimuli generated by domestic activity and the pressures or constraints generated by the external financial situation and public debt.

According to the PCA analysis for the year 2000, the main forces shaping the economy appear to be related to the balance between domestic and foreign economic performance.

Table 2. PCA of EU Economic Indicators - year 2021

Indicators	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10
Exports	-0.493	0.136	0.055	0.014	-0.300	0.013	-0.207	-0.140	-0.201	-0.737
Imports	-0.476	0.152	-0.021	-0.037	-0.336	0.010	-0.366	-0.196	-0.154	0.663
FDII	-0.052	0.411	-0.453	-0.131	0.528	-0.281	0.058	-0.462	-0.176	-0.027
FDIO	-0.423	0.318	-0.031	-0.225	0.034	-0.193	0.210	0.345	0.683	0.007
GDP_growth	-0.093	0.363	-0.050	0.851	-0.035	0.119	0.321	0.085	-0.056	0.066
Inflation	-0.057	-0.466	-0.395	0.095	-0.430	-0.326	0.398	-0.362	0.184	0.001
Unemployment	0.319	0.271	0.306	0.065	-0.256	-0.788	-0.124	0.104	-0.117	-0.002
Public_debt	0.348	0.374	0.251	-0.074	-0.263	0.307	0.005	-0.575	0.418	-0.040
Budget_deficit	-0.214	-0.355	0.367	0.375	0.429	-0.215	-0.326	-0.310	0.347	-0.010
GDP_per_capita	-0.261	-0.035	0.584	-0.218	0.111	-0.024	0.627	-0.184	-0.304	0.104

Source: Eurostat & World Bank. The data was processed by the author with statistical software R

In order to interpret the 2021 main components (Table 2) of the 2021 economic data, we will focus on how they capture different aspects of economic dynamics, based on the weights of each economic indicator in the first main components, as well as the proportion of variance explained by each of these components. PC1 (35.42% of the total variation) is dominated by exports, imports, FDII, FDIO and public debt, with exports and imports having large negative weights. This indicates that PC1 could reflect forces related to trade balance and capital flows. A large negative value for exports and imports suggests a shift towards import-dependent economies, while a large positive weight for public debt reflects the impact of public finances on the economy. A negative weight for FDII and FDIO also indicates an impact of foreign investments on the domestic market.

PC2 (21.13% of the total variance) shows strong positive influences from FDII and negative influences from inflation, which may suggest that this component seems to distinguish between foreign direct capital and domestic pressures such as inflation. The positive contribution of FDII together with the negative contribution of inflation could reflect the tension between attracting foreign investment and maintaining price stability.

In PC3 (16.01% of the total variance) the large positive share of GDP per capita is remarkable, suggesting that this component could represent the level of development or economic prosperity. Negative contributions from FDII may indicate that in more developed countries, domestic direct investment may be more important than foreign direct investment.

The analysis suggests that the economy in 2021 is strongly influenced by the balance between foreign trade and the state of public finances (PC1), the balance and tension between

foreign investment and domestic stability (PC2) and the degree of economic development measured by GDP per capita in contrast with foreign direct investments (PC3).

The comparative analysis of economic data through the prism of principal components analysis for the years 2000 and 2021 reveals a significant evolution in the approach and structure of economies in the context of globalization and macroeconomic changes. During these two decades, changes in economic dynamics are not just reflections of variations in numbers, but rather of a strategic adaptation and maturation of economic policies at the global level.

In 2000, economies were marked by a clear distinction between domestic and external performance, illustrated by the contrast between domestic economic health (inflation and unemployment) and external commitments (exports, imports, foreign direct investment). This divide shows the struggle of economies to balance domestic needs with international pressures and opportunities, an important aspect in the context of accelerating convergence.

As we move into the year 2021, we see a significant shift, where economic concerns are no longer divided into domestic and foreign, but rather reflect a complex interdependence, where trade balance, public debt management and attractiveness for foreign direct investment take on new dimensions. This evolution reflects an adaptation to a changing global environment, in which the impact of public finances on the economy becomes more and more evident, and the need to attract foreign capital is balanced with the need to maintain internal stability, especially in the context of inflation.

Moreover, the increased focus on GDP per capita in 2021 indicates a shift towards recognizing the importance of sustainable economic development and prosperity. It is no longer just a performance indicator, but becomes a central objective of economic policies, reflecting a deep understanding that economic growth must be inclusive and benefit the entire population.

Conclusions

The detailed analysis of the economic data for the member states of the EU during the period 2000-2021 showed that the process of convergence continues, but critical aspects related to this process were also identified. PCA and dendrogram analysis revealed a clear trend towards economic alignment between member countries, signalling a deeper integration among EU economies. This convergence, manifested by the convergence of inflation rates and GDP per capita, reflects the success of unified monetary policies and harmonized economic frameworks at European level. However, the persistence of divergences in fiscal and labour market management underlines the limits of current convergence and the need for more coordinated and tailored approaches at the level of each member state.

Referring back to the year 2000, macroeconomic indicators are dispersed, indicating diverse economic profiles between EU countries, convergence being suggested by a closer grouping of these indicators over the years. Thus, indicators such as inflation and

unemployment form a separate cluster, suggesting a dissociation from other economic variables. Over time, we see a tendency to unify the indicators into more coherent clusters, indicating a harmonization of economic trends between member states. This trend of clustering and convergence between different indicators suggests economic convergence in the EU, possibly reflecting more uniform economic policy and strengthened economic integration.

The observed convergence may be influenced by several factors, including the global financial crisis of 2008-2009, which changed the perspective on global interconnections and the role of macroeconomic policies. Also, an increase in global economic integration, changes in the structure of world trade, and increased attention to the impact of foreign investment on local economies could contribute to this convergence trend.

Therefore, it is essential to know that, although economic convergence between EU countries is a fundamental objective, it is not sufficient on its own to ensure economic security. Convergence must be accompanied by robust solidarity mechanisms, effective cohesion policies and an increased capacity of the Union to respond collectively to economic crises. This requires a dynamic and adaptable approach that capitalizes on the progress made in convergence, but is also prepared to address new economic challenges and mitigate remaining divergences.

In conclusion, the economic security of the European Union in a volatile global environment requires more than achieving economic convergence, it requires a comprehensive vision and concerted actions that promote not only economic alignment, but also increased collective resilience. The integrated approach, comprising structural reforms, fiscal consolidation and cross-border cooperation, will be the key to a more secure and prosperous European Union, able to adapt effectively to the challenges of the 21st century.

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WHY ECONOMIC FREEDOM MATTERS IN DETERMINING FINANCIAL STABILITY: A CASE STUDY ON SIX EASTERN EUROPEAN COUNTRIES

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Abstract: *The down turning events from the beginning of the XXIst century, starting with the 2008 crisis and then the COVID-19 pandemic, shortly followed by Russia's invasion in Ukraine, exacerbated some preexisting vulnerabilities and created new risks. In this context, the financial stability in the Eastern European states (we will consider Eastern Europe in Winston Churchill's terms, namely those countries on the eastern flank of the Iron Curtain) represents an important debating issue for both policy-makers and researchers. Therefore, the present paper aims to quantify the financial stability and to determine the factors that can influence it. In doing so, we first have to establish what we consider to be financial stability: what it means at the microeconomic level (focusing on the behaviour of the citizens) and what it means at the macroeconomic level (looking at the role of states in ensuring financial stability). It is important to note that the analysis we wish to undertake will be at a regional rather than at an overall European level, focusing on the Eastern European countries that have joined the European structures. We will present, by means of statistical analysis, the importance that both economic freedom and education have in increasing the financial stability of Eastern European citizens, taking into account the evolution of the financial stability of Eastern European citizens over the last years. In order to perform an analysis for more countries and over a longer period of time, we will utilize panel data analysis. We will observe the role that both variables play in ensuring a greater level of financial stability for the people from these countries.*

Keywords: *Financial stability, European Union, economic freedom, tertiary education, Eastern Europe*

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Introduction

The peculiarity of the contemporary era is that the XXIst century has been marked by various events which, although recent, have had a serious and powerful impact on the whole humanity, in particular transnational events such as the 2008 financial crisis and the crisis generated by the Coronavirus pandemic. In such a context, where the certainty of continued and gradual prosperity has been strongly questioned, citizens around the world have begun to

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reconsider their own priorities, emphasising the importance of the economic factor more than in the previous years. This premise, therefore, leads us to consider the area of financial stability as a particularly important one for contemporary economic science, taking into account that the very concept of financial stability is bi-dimensional: on the one hand we have the financial stability of nation states (at the macroeconomic level) and on the other hand we have the financial stability of individuals in their own households (the microeconomic level).

The present paper aims to quantify the financial stability and to determine the factors that can influence it, by conducting cross-dimensional research, as we need both microeconomic and macroeconomic perspectives. Moreover, the analysis will focus on a regional level, looking closely at the Eastern European countries that have joined the European Union since 2004. The countries selected for our analysis were the Czech Republic, Slovakia, Poland, Hungary, Romania and Bulgaria.

The objective of this research is to clarify the meaning that citizens attribute to financial stability, starting from the definitions offered by experts in the field and providing our own vision on financial stability (which will be legitimised by further data analysis). We will, therefore, try to present a vision of financial stability that is as close as possible to the ordinary European citizen, easy to understand and to be interpreted. In doing so, however, we will focus on the six countries mentioned above because they belong to the same geographical area and, dare we say it, had the same starting point in the last decade of the last century: the fall of the Eastern Bloc.

We will see what effects the transition period from a communist regime to a capitalist one had in determining the degree of economic freedom in these countries (which subsequently influenced financial stability). Considering this, we consider it more than appropriate to focus this analysis on Eastern Europe because the countries in this geographical area have a very dynamic and impressive history: on the one hand, they were subject to a long period of communism and violation of private property, and on the other, they have rapidly adapted to the economic liberalism offered by the European Union.

Defining financial stability

The area of financial stability is extremely wide, which, starting from the financial stability that each individual has in his or her own household, can determine the degree of welfare of the nation-state. In order to better understand this phenomenon, it is necessary to provide a definition of financial stability ourselves, but this can only be done if we examine the literature on financial stability, which is vast and diverse. In order to simplify this task, we will present the main definitions of financial stability in the followings.

A first definition that we can retain, in chronological order, is that offered by Smythe, in which financial stability is described as being a relationship between different variables, such as expenditures, income and the ability to handle sudden changes in the household's financial status

quo (Smythe, 1968). It is a clear and straightforward definition, but one that, at the same time, describes very well what financial stability means to citizens in their own household. We could outline the whole analysis using the above definition, but we must also take into account the existence of other perspectives. In this regard, we note the contribution that Gary Schinasi has made in this area, considering financial stability as a synonym for a financial system where performance is facilitated and the financial imbalances (provoked by unexpected adverse events) can be easily eliminated (Schinasi, 2004). Moreover, Schinasi considers financial stability as a wide concept that encompasses institutions, infrastructures and markets (Schinasi, 2004).

Čihák's approach is also extremely interesting, because he assumes that the area of financial stability is very vague in terms of definition and, at the same time, he proposes a method of calculating it. Čihák affirms that the major problem with the field of financial stability is the absence of an operational definition, and in this sense, he proposes the distribution of systemic loss as the measure of default risk in the system (Čihák, 2007). Professor Ramlall, on the other hand, outlines a true description of how financial stability should be studied, stating that if we want to approach the area of financial stability, we should consider the fact that problems in the financial system would have repercussions on the economy as a whole (Ramlall, 2018).

Of course, we are also interested in the perspectives on financial stability of the major financial and monetary institutions. They often offer their own perspective on their official websites. In the following, we will analyse the World Bank's definition of financial stability, where it is considered as a synonym for a financial system which is stable and has the capacity of correctly allocate the resources, manage financial risks and elaborate a stable monetary policy (World Bank, 2016).

What we can see is the practical approach of the World Bank, which reveals financial instability as a quasi-inevitable phenomenon, at some point, in the age of globalisation. However, the World Bank offers some solutions, both micro and macro-economic, to curb this financial instability. We consider the definition given by the World Bank to be extremely pragmatic and appropriate to modernity.

In addition to the World Bank, we also note the definition provided by the ECB, which describes financial stability as the capacity of the financial system – composed by the market and its intermediaries – to withstand shocks (European Central Bank, 2023).

As far as the ECB is concerned, we note a financial rather than an economic definition, but we can say that this is due to the nature of this institution.

We will also take into account the Federal Reserve's view that financial stability would mean a stable financial system is that system which works effectively even when major disruptions appear (Federal Reserve, 2023).

The definition provided is broadly inclusive of the previous ones as it underlines a fundamental point, namely that of creating economic conditions that provide stability for

citizens in both 'better' and 'worse' times. This is ultimately the purpose of our financial stability research: to identify the best means of enhancing financial stability in every citizen's household. Some researchers are concerned with the financial side (such as Čihák, Ramlall or even the ECB), others are more focused with the everyday life of citizens (Smythe). Goodhart (2006), on the other hand, states that there is a definitional blur in terms of financial stability, which we have also seen in the table above. This vagueness does not necessarily derive from the complexity of the term financial stability, but rather from the two-dimensionality, as this provides ample opportunities for interpreting financial stability.

Financial stability, then, is not just the result of more or less functional government policies, but the expression of different areas that intersect within a state. Financial stability is marked, in this sense, by influences from the economic area, but also by the political, judicial, financial, social and even cultural aspects. In the following, we will try to outline the interaction between financial stability and the above-mentioned areas, in order to gain a deeper understanding of this broad concept.

Financial stability and the political arena are strictly interrelated, considering that no matter how much citizens may be confident in their own ability to survive financially, they are in any case subjects of the political system in which they live. A citizen with a higher degree of financial education, therefore, is not immune from a government that discourages economic initiatives by any means possible, suppressing it and extending governmental powers as far as possible. We note, however, that the countries analysed in this research are consolidated democracies of the European Union, which have therefore managed to overcome the dramas of a communist past in which all private economic initiative was suppressed. Yet, the degree of expression of economic freedom, especially at the political level, differs across the six countries selected. In the Czech Republic, for example, Václav Klaus had been promoting the principles of economic freedom since the early post-communist years, both politically and academically (Klaus, 2002), whereas in Romania such initiative was almost non-existent or precarious, especially in politics.

The relationship between financial stability and the judicial aspect is also relevant. A country's laws can favour or disfavour financial stability, especially when it is strictly correlated with the degree of economic freedom of the country. If we understand financial stability as a mean by which citizens choose for themselves the best way to survive economically, then it is particularly important to consider that some laws may limit this freedom of choice, including tax laws. A higher percentage of the salary going to the state will provide a smaller financial base for the citizens in defining their financial stability.

The financial aspect plays a very important role in shaping financial stability, as we have seen previously from the definitions of different authors or financial institutions. If by financial aspect we mean the banking system, then we can say that the role of banks is indeed central in providing financial stability, especially at the macroeconomic level. If we also

consider the microeconomic level of financial stability, we will note how banks play a particularly important role, considering that we live in a historical period when the need for bank credit has become a quasi-formality for the vast majority of Western citizens and not only (even though the 2008 financial crisis shook this paradigm). Banks, whether commercial or national banks, also have an interest in relating to a status quo in which there is financial stability. Considering this, our research focuses on household financial stability, which is why we will place less emphasis on the role that banks play in ensuring financial stability.

Financial stability is also an important social phenomenon, since a state will not be financially stable if its citizens doesn't acquire financial stability. A society that is not financially stable, in this sense, may be more susceptible to choose political extremes (which is what happened in Greece after the 2008 financial crisis). So, the relationship between financial stability and the social aspect is a very crucial one, especially in our research, because we want to emphasise the social side of financial stability rather than the financial one.

Last but not least, we also note the importance that culture has in shaping financial stability, as we will not deny that some cultures pay particular attention to the phenomenon of financial stability while others show less relevance to it. However, in the case of our research, we will consider that the cultural aspect is not so relevant, as we are talking about countries that belong to the same cultural area and have had a broadly similar past. However, as mentioned earlier, there are different approaches to economic freedom in these countries, especially between those located in Central-Eastern Europe (the Czech Republic) and those located in Eastern Europe (Bulgaria and Romania).

For us, financial stability is a whole cycle, which starts with the necessity of the citizens to being able to enjoy economic freedom, in a liberal democracy, and then, with the willingness of the authorities to guarantee economic freedom. Some would argue that financial stability is about the decisions that each individual makes. This is completely correct and legitimate but, at the same time, we cannot turn a blind eye to the economic system in which that individual finds himself. For example, you can have a very developed personal culture in terms of financial education, but a state that does not favour you in this respect can become a serious obstacle.

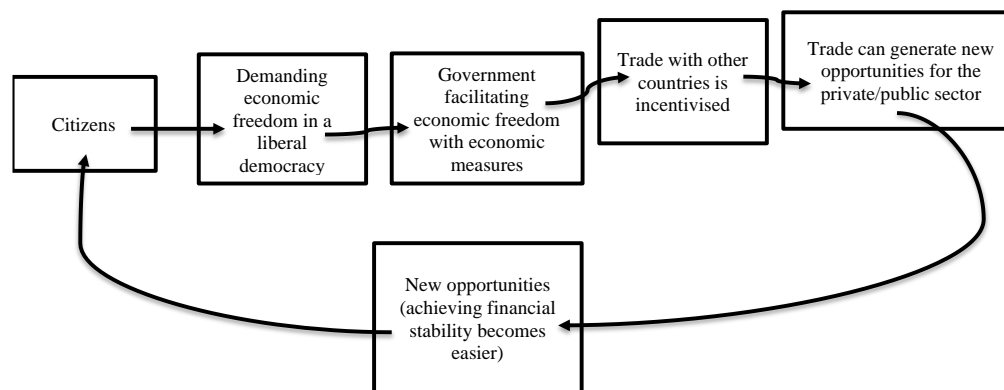


Figure 1. The financial stability cycle

Source: own elaboration

For this reason, we propose the following definition (valid for this article but which could be repeated in the future): Financial stability is the ability of individuals to cope with unforeseen economic circumstances that may affect their households. It is with this definition that we will proceed in this analysis, trying to determine the best ways to enhance such stability, which links the microeconomic and macroeconomic levels.

Research Methodology

Our empirical investigation is conducted on six Eastern European countries: the Czech Republic, Slovakia, Poland, Hungary, Romania and Bulgaria, and the period we will consider will be the last 10 years: 2013-2022.

In order to be able to use financial stability as a dependent variable, we have stipulated an aggregate indicator, composed of the following variables:

Financial stability = Inability to face unexpected financial expenses + Inability to make end meets + Persons at risk of poverty or social exclusion rate + Unemployment rate

The database used for these variables was the official website of the European Union, namely Eurostat.

The financial stability indicator will then be weighted in order to provide a greater degree of realism. In this sense, as a result of the weighting, we will obtain the following aggregate indicator:

$$F_{sx} = 0,40 * INUFEx + 0,30 * IMEMx + 0,20 * PRPx + 0,10 * Ux \quad (1)$$

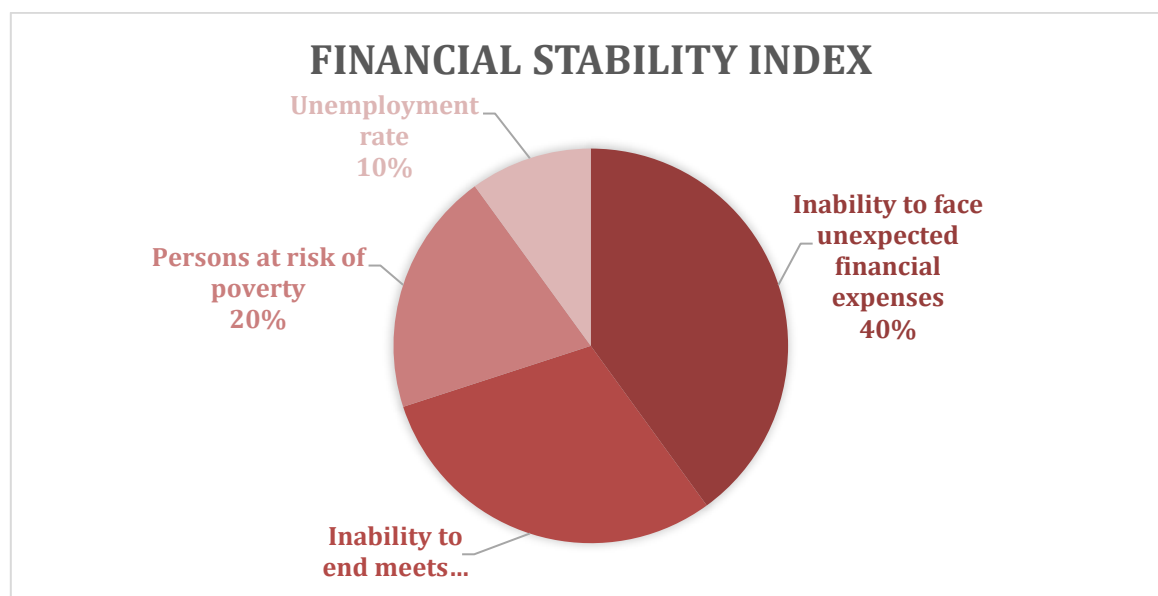


Figure 2. Aggregate indicator composition

Source: own elaboration

We collected data for all those six countries and for the period of time mentioned, then we created the aggregate indicator and inverted it (inversion being necessary because the variables used would indicate rather financial instability than financial stability). If we consider, for example, the Czech Republic and the year 2013, we will have the followings:

Table 1. Example of elaboration of the financial stability indicator

Year	Country	INUFE (40%)	IMEM (30%)	PRP (20%)	UNMP (10%)	Pondered total score	Inverted score (100-x)
2013	Czech Republic	41,7	9,1	8,5	7,0	21,81	78,19

Source: own elaboration

Results and discussions

As it can be seen in Figure 3, the financial stability of the six analysed states had a positive trend during the last 10 years.

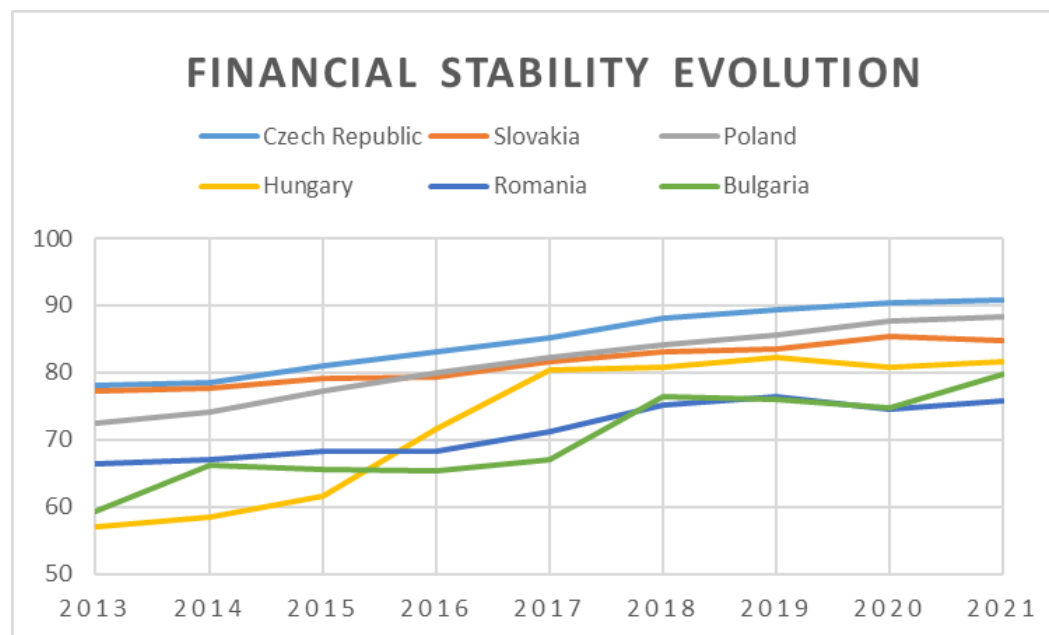


Figure 3. Financial Stability evolution in Eastern Europe 2013-2021

Source: own elaboration

We decided to use a statistical analysis with the panel data methodology because, considering the nine-year period we want to analyse, and also that we are interested in all the six countries presented, the most appropriate and simple solution to obtain concrete results is

panel data analysis (more efficient than if we had analysed each country with time series or cross section methodologies).

Using various predictors (provided by both Eurostat and the World Bank), we can observe the following patterns:

Table 2. Correlation matrix of the variables

Variable/Probability	FS	ICT IMPORT	MANUF EXPORT	TERTIARY EDUCATION
FS	1.000			
ICT IMPORT	0.517	1.000		
MANUF EXPORT	0.532	0.836	1.000	
TERTIARY EDUCATION	0.383	-0.059	-0.258	1.000

Source: Own elaboration

What we can observe is a positive correlation between all the predictors and our dependent variable, while the variable Tertiary Education as a negative correlation with both the percentage of ICT Import and the percentage of Manufactures export.

Table 3. Panel data regression results with random and fixed effects

Variables	Model 1		Model 2		Model 3		Model 4	
	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects	Random effects
ICT IMPORT	0.599 (0.531)	0.068 (0.460)	-	-	0.787 (0.606)	1.072** (0.402)	0.711 (0.669)	-0.198 (0.549)
MANUF EXPORT	1.155** * (0.294)	0.747*** (0.183)	1.185*** (0.294)	0.711*** (0.138)	-	-	1.999* ** (0.312)	0.855** * (0.205)
TERTIARY EDUCAT	1.850** * (0.347)	2.000*** (0.274)	1.866*** (0.348)	1.969*** (0.262)	2.586** * (0.335)	2.088** * (0.293)	-	-
CONSTANT	- 61.641* **	-26.763**	-57.908	-22.326*	12.690	20.364* *	- 90.373 ***	10.775
ADJ R ²	0.806	0.615	0.805	0.611	0.746	0.484	0.691	0.220

Notes: Standard errors are mentioned in parenthesis., Significance levels are *** for 1%, ** for 5% and * for 10%.

Sources: own elaboration

Considering the results, where we can see that we have different models that have a valid level of significance, we can say that there is an influence between the selected predictors

and our financial stability indicator. Each of the four models presented is important and at the same time interesting, but we have chosen model number 3 and model number 4 to better explain our analysis. Therefore, we can state that it is appropriate to perform a Hausman test to check whether the models fit better with fixed or random effects. We note:

Table 4. Hausman test for model number 3

Hausman Test			
Equation: Model 3			
Cross-section with random effects			
Summary	Chi-Sq. Stat	Chi-Sq. d.f.	Probability
Cross-section random	9.273167	2	0.0097

Source: Own elaboration

Table 5. Hausman test for model number 4

Hausman Test			
Equation: Model 4			
Cross-section with random effects			
Summary	Chi-Sq. Stat	Chi-Sq. d.f.	Probability
Cross-section random	23.628595	2	0.0000

Source: Own elaboration

Observing the probability level obtained in the two Hausman tests, we consider the models with the fixed effects as rather appropriate for our analysis. The two fixed models selected, however, have some limitations (as can be seen in Table 3), but we can still discuss the influence that the three variables have on the financial stability of European citizens, namely ICT imports as a percentage of Gross Domestic Product (World Bank), manufactures exports as a percentage of merchandise exports (World Bank) and the percentage of the population with tertiary education (Eurostat). First of all, what we can observe is the existence of a correlation between the independent variables mentioned above and our indicator of financial stability. We could also observe different statistical models, each showing a more or less relevant degree of significance. What we were able to gather from these models is that, broadly speaking, the financial stability of Eastern European citizens could be predicted exactly by the three independent variables chosen: ICT imports, manufactures exports and the percentage of the population with tertiary education. Of the three variables, two are expressions of economic freedom and the opportunity to engage in unrestricted trade, while the third variable shows how important education is to enjoying a greater degree of economic freedom.

The ICT imports variable leads us to the premise that if a country, enjoying economic freedom, will import technology, more opportunities will arise for the citizens of that country,

making it possible for them to earn an income that will allow them to 'survive economically'. On the other hand, we also have manufactures exports, a variable that also shows how through economic freedom, citizens and firms as a whole can be stimulated to increase their own productivity which, again, is parallel to an increase in the degree of financial stability in their own household. Tertiary education, in turn, helps us to better understand the relationship between personal skills and financial stability in one's own household, as we can say that having skills from tertiary education certainly has a positive role in finding opportunities.

We will also look in more detail at the differences between the six countries analysed, taking into consideration that the results produced derive from a multitude of historical, social and economic factors that have differentiated these six countries, even though they all belong to the Eastern European area. On the one hand, we have some countries, such as Slovakia, the Czech Republic, Hungary and Poland, which managed to join the European structures since 2004, and this is reflected in the scores they obtained on financial stability (even if Hungary was in the last place in the period between 2013 and 2015, it recovered in the subsequent period). On the other hand, however, we observe how Romania and Bulgaria, which had a delayed accession to the European structures, managed to obtain lower scores on financial stability. Moreover, we have to take into account the phenomenon of mass emigration, which concerns both countries, and therefore retain that they could have an even lower score on financial stability than the one projected in this analysis.

The differences between the Czech Republic, the Eastern European country at the top of the financial stability ranking, and Romania, the country at the bottom of the six, can also be found in the importance that the political classes of these two countries attached to private property, including during the period of communist rule. Regarding this topic, we have to consider that after World War II, the Czech Republic turned to communism, and the new political class prepared a new Constitution, approved in 1948. Despite that, human freedom and human rights still had an important degree of importance. On the other hand, Romania had the same political path, turning into a communist state, but private property and human rights had a lower degree of importance in the various communist constitutions, especially for peasants (Socoliuc et al., 2021). In the Czech Republic private property was never fully eliminated, while Romania, on the other hand, faced the process of collectivization, one of the most brutal in all the Eastern Bloc.

Moving on from the evolution of the Cold War, we arrive to the 1990s, when the Iron Curtain was brought down once and for all. This crucial moment in contemporary history proved nothing other than that the capitalist system, which placed economic freedom at the centre of the social and economic life, was a more workable system than the communist one, which promoted forced state control, especially over trade. As a result, the Eastern European states, that had fallen under Soviet influence, chose to abandon their former ideologically

charged political institutions and practices in favour of a political system in which economic freedom really mattered.

The last decade of the second millennium began with a widespread exaltation of economic freedom as a result of the 'triumph of capitalism over communism'. We must consider, also, that during this period there were important differences in the political approach between Romania and the Czech Republic (as mentioned above, the difference in approach was also visible in the period necessary for the accession of these two countries to the European structures), such as the citizens attitude towards democracy and freedom, considering that the Czech citizens were natively predisposed towards democracy and freedom, while in Romania the situation wasn't the same (Socoliuc et al., 2021). The post-communism Constitution, in the Czech Republic, was modified in accordance with the healthy principles of the western civilized societies, and laws were adopted as to restrict the former communist party members' access to the new political environment. A fundamental aspect of the Czech transition was the lustration law, that had a key role in protecting the institution of private property, while in Romania a law of that type was not popular, giving former political dignitaries the opportunity to mark the new post-Decembrist political scene.

Subsequently, the countries that had begun to enjoy the benefits of capitalism expanded their own economic freedom by joining the European Union. This aspect of accession to European structures is particularly important to remember, because the European Union has been and still is a vector for the expression of economic freedom, because economic freedom and free trade itself have been the values on which the European Union has been built since the 1950s. Moreover, the European Union has also been a real source of investment and economic partnerships between private individuals, offering new opportunities to the citizens of these Central and Eastern European countries.

In conclusion, it is necessary to state, that these variables show us the possibility of a much closer link between economic freedom and the financial stability of European citizens, capable of being extended to the European Union as a whole and also explained by variables that further accentuate the expression of the economic freedom. We believe that this study can be a starting point for future, more nuanced studies with an even stronger focus on this relationship.

Conclusions

The results we have obtained are at a preliminary stage, requiring of course further deepening and new ways of calculating both financial stability and economic freedom.

Nevertheless, we dare to say that the present analysis can be a starting point for more detailed analyses, which would highlight in more depth the impact of the economic freedom in generating financial stability in the households of European citizens and beyond. We will see

the financial stability as an area of continuous progress, capable of being improved both from a strictly financial perspective, highlighting the importance of banks and financial control institutions, and from an economic perspective, as it was the case in this analysis, where we saw what works and what does not work in countries' attempt to provide the greatest possible degree of financial stability for their citizens.

We have noticed that the situation in Eastern Europe is very different, because we have a country that has been embracing the economic freedom even since the beginning of the 1990s – the Czech Republic, which has managed to guarantee a fairly high degree of financial stability for its citizens, while we also have other countries, such as Romania, which, although it started out ahead of countries such as Bulgaria and Hungary (as can be seen in figure 3), has stagnated in successive years, offering an extremely low degree of financial stability to its citizens. Other surprising aspects that emerge from this research are the substantial increase in financial security in Hungary in recent years, but also the stagnation of the financial stability in Slovakia (but we must consider that the financial stability of the Slovak citizens, overall, is relatively higher than that of Romanians). In the present research, we have also noted the very important role that trade, an expression of the economic freedom, plays in shaping the financial stability. Trade can be expressed through different initiatives of the nation states. In this case we have chosen technology imports and manufactures exports because we considered that they play a fundamental role in creating economic welfare in Eastern Europe and financial stability in this sense. Meanwhile, we have also taken into account the level of the tertiary education, because this is a generator of working opportunities and such opportunities can facilitate the financial stability.

If we consider the fixed effects models (which are more appropriate from a statistical point of view, if we value statistical validity as our main objective), of all the variables tested, the most important is the export of manufactures, showing us that a country with this characteristic can be synonymous with a country where the population is active on the labour market and, in this sense, is more protected from unforeseen economic situations.

It is important to note that this research is aimed at both ordinary citizens, demonstrating how education and active involvement in the labour market are the best antidotes to financial instability, but also at citizens involved in political decision-making, demonstrating that this research also explains how economic freedom (i.e. less state intervention in the economy) can produce more financial stability for citizens. However, we assume that our research has some limitations, namely that: financial stability could also be calculated using many other indicators (thus creating a more comprehensive financial stability aggregate indicator) and also that there is some degree of difficulty to explain in detail the whole process linking economic freedom and financial stability.

We conclude that this analysis has a certain degree of relevance, as it provides a new perspective on financial stability but, at the same time, we want to continue the research on this phenomenon, improving the models we proposed in this analysis.

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ORGANIZATIONAL COMMITMENT IN TIMES OF CHANGE: LESSONS FOR MOLDOVA FROM EUROPEAN PRACTICES

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Abstract: *This paper conducts a nuanced examination of organizational commitment, drawing from an array of European business practices to navigate the complexities introduced by the COVID-19 pandemic and the Ukrainian conflict. Employing a meticulous literature review methodology, the research spans academic articles, official reports, and organizational publications from 2010 to 2023. The selection criteria focused on relevance to organizational commitment, crisis management, and the impact of significant crises, employing a combination of keywords across various databases and websites. The analysis revealed an evolving understanding of organizational commitment, highlighting the necessity for Moldovan organizations to adopt contextually adapted engagement strategies. This adaptation is crucial in addressing the unique challenges posed by Moldova's socio-economic conditions and the external pressures from regional instabilities. The study underscores the importance of flexible work arrangements, digital infrastructure improvements, and culturally informed management practices in fostering organizational commitment amidst uncertainty, offering insights for organizations aiming to maintain a committed workforce in challenging times.*

Keywords: *organizational commitment, crisis management, COVID-19 impact, Ukraine War, business strategy*

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Introduction

In the evolving landscape of global business, organizational commitment emerges as a critical determinant of employee retention, engagement, and overall productivity (Al-Jabari & Ghazzawi, 2019). This commitment, shaped by an amalgamation of work environment factors and broader economic and social dynamics (Hejkrlik, Chaloupkova, & Sokolska, 2023), is particularly salient in the context of Moldova. The challenges of fostering organizational commitment in Moldovan enterprises are distinct and multifaceted, deeply rooted in the nation's unique socio-economic and political environment. Moldova grapples with pervasive corruption, weak governance structures, and economic fragility—issues that are further compounded by external pressures, such as the ongoing conflict in neighboring Ukraine (Covaş, 2019; Covaş, 2023). These conditions not only destabilize the business landscape but

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also directly impact the workforce, undermining the foundation necessary for building strong organizational commitment.

The significance of enhancing organizational commitment within Moldovan companies cannot be overstated. A committed workforce is indispensable for navigating the complex interplay of internal vulnerabilities and external threats that characterize the Moldovan context. High levels of organizational commitment are associated with increased resilience, enabling businesses to weather economic downturns, political instability, and other crises. Moreover, as Moldovan enterprises strive to align with global business trends and standards, fostering a culture of commitment becomes imperative for attracting and retaining talent, maintaining competitive advantage, and achieving sustainable growth.

Given these considerations, this paper aims to bridge the gap by reviewing literature and case studies on European business models to identify and adapt actionable strategies that can bolster organizational commitment within Moldovan companies. The European model, noted for integrating responsibility, sustainability, and ethical governance (Eliyana & Ma'arif, 2019), offers a holistic framework for addressing the systemic challenges endemic to the Moldovan business environment. This research meticulously analyzes existing literature to distill strategies that not only enhance organizational commitment but are also feasible and effective in the Moldovan socio-economic and political context. Through this focused inquiry, the paper endeavors to provide Moldovan enterprises with a blueprint for cultivating a robust, committed workforce poised to navigate the complexities of the contemporary business world.

Methodology

In order to conduct a comprehensive literature review encompassing the past decade and considering various influential events such as the COVID-19 pandemic and the Ukraine war, our methodology must be thorough and inclusive. This methodology section outlines our approach to selecting sources, search strategies, and analytical techniques.

Our temporal scope spans the years 2010 to 2023, allowing us to capture the evolving trends in organizational commitment and responses to crises such as the COVID-19 pandemic and the Ukraine war. We do not limit our sources to academic papers alone but include peer-reviewed academic papers, official reports, policy documents, white papers, and publications from reputable organizations such as the World Health Organization, United Nations, and European Commission. While our primary focus is on Europe, we also incorporate significant global studies and documents that offer broader insights or comparative perspectives. Source selection is based on relevance to organizational commitment, crisis management, employee behavior, and organizational strategies during turbulent times.

Our search strategy involves using academic databases like Google Scholar, JSTOR, and Web of Science, as well as official websites of international organizations. We employ

various combinations of keywords such as "organizational commitment," "crisis management," "employee engagement during crises," "COVID-19 organizational impact," "Ukraine conflict and business," "European organizational strategies," and "organizational studies in Moldova." Boolean operators like AND, OR, and NOT are used to refine our searches, for instance, "organizational commitment AND crisis management AND Europe NOT Asia." Additionally, we engage in hand searching by reviewing references in relevant papers and consulting specific journals and organizational websites for targeted information.

Our analytical approach consists of several key stages. Initially, we conduct an initial screening by reviewing abstracts, executive summaries, and introductions to assess relevance based on our selection criteria. Selected literature undergoes full-text analysis, wherein we extract essential information regarding study objectives, methodologies, findings, and conclusions. We employ thematic coding to categorize the extracted data, enabling us to identify patterns, trends, and key discussions related to organizational commitment during crises. Subsequently, we synthesize findings from diverse sources, facilitating a comprehensive overview that includes comparisons between academic theories and practical insights from official documents. Critical appraisal is a crucial step in evaluating the credibility, reliability, and relevance of sources, particularly official documents, considering their origin, purpose, and context.

Our analytical approach, incorporating a comprehensive screening and thematic analysis of selected literature, ensures a robust synthesis of findings. By embracing a broad spectrum of sources, including academic papers, official reports, and esteemed organizational publications, we aim to deliver a nuanced and multi-dimensional understanding of organizational commitment across different crises. This inclusive strategy enriches our review, allowing us to offer a balanced perspective that merges theoretical insights with practical implications, particularly relevant to diverse contexts including Moldova.

Findings

Following the methodology outlined for conducting a thorough literature review, the search strategy was meticulously implemented across several academic databases and official websites. This strategy was based on a combination of keywords related to organizational commitment, crisis management, and the impacts of the COVID-19 pandemic and the Ukraine war. The literature search yielded a diverse array of sources: 51 papers from Google Scholar, 35 from JSTOR, and 38 from Web of Science. Additionally, the examination of official websites, including the World Health Organization, United Nations, and European Commission, revealed 12, 10, and 15 pertinent documents, respectively. This comprehensive search process ensured a rich compilation of scholarly articles, official reports, policy documents, and publications, providing a broad spectrum of insights into the dynamics of organizational commitment in the face of crises.

The analysis of these varied sources revealed significant findings, notably the evolution of organizational commitment within the tumultuous backdrop of recent global crises. Google Scholar emerged as the most prolific source of relevant literature, while JSTOR and Web of Science offered highly specialized studies that added depth to the review. The official documents sourced provided practical perspectives on crisis management and its implications for organizational commitment, complementing the theoretical frameworks identified in academic papers. This dual approach, combining theoretical exploration with real-world applicability, underscored the unique contribution of this review.

The literature indicates a significant evolution in the concept of organizational commitment over the past decade. Meyer and Allen's three-component model (affective, continuance, and normative commitment) remains a foundational theory, but recent studies suggest a more dynamic and context-dependent understanding of commitment (Meyer & Allen, 1991). For instance, research has shown that organizational commitment can fluctuate in response to external factors such as economic conditions and internal factors like leadership style (Becker, Klein, & Meyer, 2012).

Economic downturns and political instabilities, such as those seen in the Eurozone crisis and subsequent Brexit, have been found to impact organizational commitment. Luthans revealed that economic uncertainty led to a decrease in affective commitment but an increase in continuance commitment, as employees felt more insecure about changing jobs during unstable times (Luthans, 2011).

The COVID-19 pandemic brought about unique challenges. Research highlighted a dual impact: while some employees experienced decreased commitment due to stress and job insecurity, others felt a stronger bond with their employers who showed empathy and support during the crisis (Chanana & Sangeeta, 2021). A key lesson was the importance of transparent communication and organizational support in sustaining commitment during such unprecedented times (Sun, Li, Lee, & Tao, 2023).

The ongoing conflict in Ukraine has led to significant economic and geopolitical shifts, affecting organizational commitment. Companies with operations or supply chains linked to the region faced heightened uncertainty, impacting employee commitment levels. Organizations that proactively managed the crisis, maintaining transparent communication and employee well-being, were better at sustaining commitment (Obłój & Voronovska, 2024; Petitta & Martínez-Córcoles, 2023).

Advancements in technology over the past decade have also influenced organizational commitment. The rise of remote work, particularly accelerated by the pandemic, has reshaped the work environment. Studies suggest that remote work can lead to higher affective commitment if managed well, with factors like work-life balance and flexibility playing a key role (Alshibly & Alzubi, 2022; Chauhan, Howe, & Nachmias, 2023).

Research has also highlighted significant cultural and regional variations in organizational commitment. European countries, with their diverse cultures and economic systems, exhibit varying patterns of commitment (Eisinga, Teelken, & Doorewaard, 2010). For instance, studies indicated higher levels of normative commitment in collectivist cultures compared to individualistic cultures (Dunn, Dastoor, & Sims, 2012).

In the context of Moldova, the deployment of strategies specifically adapted to the nation's context is critical for fostering organizational commitment. According to Pilkington (Pilkington, 2019), Moldova's socio-economic landscape is characterized by systemic corruption and economic instability. This poses unique challenges to maintaining employee commitment. Furthermore, Vostricov et al. (Vostricov, Casian, & Cobzari, 2023) note the country's geographical and political proximity to the Ukraine conflict introduces additional layers of complexity, affecting economic stability and workforce wellbeing. For instance, the conflict's spillover effects have led to increased economic downturn, disrupted trade, and security uncertainty (Bencheci, 2023; Chistruga, 2023). This can demotivate employees and erode their commitment to their organizations.

The COVID-19 pandemic has compounded these challenges, highlighting the urgent need for Moldovan organizations to adopt flexible work arrangements and enhance digital infrastructure (Barbăneagră, 2022). Such strategies are essential not only for business continuity but also for maintaining organizational commitment by acknowledging and responding to employees' needs during crises. Zaharov (Zaharov, 2020) emphasizes the importance of supportive HR policies that reflect the unique socio-economic conditions faced by Moldovan employees. These measures can be crucial for fostering a resilient and committed workforce.

Thus, Moldovan companies must tailor their approaches to enhance organizational commitment, considering the multifaceted socio-economic conditions and the direct implications of regional conflicts and global pandemics. Adopting strategies sensitive to the cultural nuances and economic realities of Moldova can help organizations navigate these challenges more effectively, ensuring a committed workforce capable of contributing to sustainable business growth (Duca, 2023).

Discussion

The discussion section of this literature review critically examines the implications of the findings regarding organizational commitment in various contexts, particularly in the face of economic crises, technological changes, and geopolitical events like the COVID-19 pandemic and the Ukraine war. This section also contemplates how these insights might inform strategies in European countries, with a specific focus on Moldova.

The findings suggest that economic downturns and political upheavals, such as those experienced during the Eurozone crisis or the Brexit negotiations, have a nuanced impact on

organizational commitment. For instance, the increase in continuance commitment during economic uncertainty, as found by Luthans, reflects a risk-averse tendency among employees (Luthans, 2011). This implies that in times of economic turbulence, employees may prioritize job security over other employment attributes. However, this form of commitment might be more about necessity than loyalty or engagement, which can have long-term implications for employee morale and productivity.

The dual impact of the COVID-19 pandemic on organizational commitment underscores the pivotal role of employer support and transparent communication. Organizations that actively supported their employees, either through flexible work arrangements or mental health support, saw an increase in affective commitment. This aligns with the broader literature on crisis management, which emphasizes the importance of organizational support systems in sustaining employee morale and commitment during challenging times (Chanana & Sangeeta, 2021; Sun et al., 2023).

The ongoing conflict in Ukraine presents a complex scenario where organizations need to navigate not only the immediate operational challenges but also the broader implications for employee commitment. Studies suggest that organizations that engage in proactive crisis management can maintain higher levels of commitment (Oblój & Voronovska, 2024; Petitta & Martínez-Córcoles, 2023). This may involve clear communication about the organization's response to the crisis, as well as measures to ensure employee safety and job security.

The rise of remote work and digitalization has reshaped the landscape of organizational commitment. The increased flexibility and perceived work-life balance associated with remote work can enhance affective commitment, but it also requires a shift in how organizations engage with their employees. Maintaining a sense of connection and belonging in a remote environment is a new challenge that organizations must address (Alshibly & Alzubi, 2022; Chauhan et al., 2023).

The nuanced cultural and regional differences in organizational commitment underscore the imperative for a contextually adapted management approach, a perspective deeply relevant to European organizations, Moldova included. Such adaptations are not merely theoretical constructs but are necessitated by empirical evidence illustrating the unique challenges faced by Moldova's socio-economic and geopolitical context. For instance, a study conducted by Pilkington (Pilkington, 2019) delves into the socio-economic fabric of Moldova, identifying systemic corruption and economic instability as key deterrents to organizational commitment. This backdrop is further complicated by Moldova's proximity to the ongoing Ukraine conflict, which Vostricov et al. (Vostricov et al., 2023) demonstrate to have tangible impacts on the economic stability in Moldova, thus affecting the workforce.

Additionally, the COVID-19 pandemic has served as a catalyst, exacerbating existing vulnerabilities and introducing new dynamics to workplace engagement. Zaharov (Zaharov, 2020) highlights the pandemic's transformative effect on Moldova's labor

market, necessitating a swift adaptation to remote work, especially within the burgeoning IT sector. This shift underscores the critical need for strategies that not only cater to the immediate demands of digitalized work environments but also address long-term employee well-being and job security, essential components of organizational commitment. Such strategic pivots are vital for Moldovan organizations, as they navigate the compounded pressures of economic transition, regional instability, and the aftermath of global health crises. Through these insights, it becomes evident that fostering organizational commitment in Moldova demands an acute awareness of and responsiveness to the cultural, economic, and political intricacies unique to the region.

Conclusions

This paper has examined the concept of organizational commitment within the context of Moldova, with a particular emphasis on lessons learned from European business practices. Through a detailed review of existing literature, including scholarly articles, official reports, and organizational publications, we aimed to understand the dynamics of organizational commitment amid economic crises, technological advancements, and geopolitical tensions such as the COVID-19 pandemic and the Ukrainian conflict.

Our investigation revealed the critical role of contextual adaptation in managing organizational commitment. It highlighted the need for Moldovan organizations to navigate their unique socio-economic and political landscape carefully, incorporating flexible work arrangements and digital infrastructure enhancements in response to the changing work environment prompted by the pandemic. The analysis also pointed out the importance of culturally sensitive engagement strategies to address Moldova's specific challenges and opportunities, particularly in light of its growing IT sector.

This paper contributes to the broader discussion on organizational commitment by emphasizing the significance of tailored strategies that respond to both global trends and local realities. While it does not claim to offer comprehensive solutions to the complex issues faced by organizations in Moldova and similar contexts, it suggests a pathway for further research and practical exploration in the pursuit of sustainable organizational commitment strategies.

The insights gleaned from this review may serve as a starting point for organizations looking to strengthen their commitment initiatives in challenging times, recognizing the ongoing need for adaptability, resilience, and a deep understanding of the local context.

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IS SUSTAINABLE COMPETITIVE ADVANTAGE ANTEDILUVIAN?

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Abstract: *This article aims to understand the contemporary relevance of the sustainable competitive advantage (SCA) concept in strategic management. Mainstream management and business training perpetuates the use of SCA despite indications that it is elusive. This study intends to elucidate how, in the 4th Industrial Revolution (4IR) world, SCA has become irrelevant, what the possible reasons are for its continued use and what alternatives can be explored for business success. The study followed an exploratory, constructivist grounded theory approach. Data were obtained from 27 semi-structured interviews to develop a grounded theory. Findings revealed four main themes, and pronounce that in a complex, interconnected business world, SCA is mostly obsolete, which demands an organisation to adapt its strategy, business model and culture to create value, be relevant, have a significant (positive) impact and contribute to the common good. The main implication of the study is therefore that SCA should no longer be promoted as a key concept for organisational success by management and academia. Alternatives to SCA, such as agility and complexity management, are more relevant in an interconnected 4IR business environment. The study enhances the body of knowledge by bolstering the critique on the continued use of SCA in contemporary business management. It furthermore highlights potential erroneous assumptions through a direct explanation of why SCA assumptions are antiquated.*

Keywords: *strategy; sustainable competitive advantage; organisational change; disruptive change; 4IR.*

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Introduction

Mainstream management thinking purports sustainable competitive advantage (SCA) as essential for an organisation to attain long-term success in terms of competitive rivalry and longevity (Porter, 1985). However, it would appear that in the current disruptive and interconnected environment of the 4th Industrial Revolution (4IR), the sustainability of competitive advantage (CA) is being challenged (Lindskov et al., 2021). In the contemporary 4IR environment, CA seems transient (McGrath, 2013) and quite elusive instead of sustainable. Yet, organisations still doggedly pursue SCA, and universities and business schools still harp on the importance of establishing SCA in their educational offerings.

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Although challenges to the notion of SCA in management have gained traction in literature (McGrath, 2013; Lindskov et al., 2021), it is unclear why the SCA concept is being perpetuated despite indications of its elusiveness. This apparent knowledge gap prevents academics and business practitioners from exploring and capitalising on alternatives to SCA in their pursuit of business success and organisational performance. To address the knowledge gap and contribute to the body of knowledge on alternatives to SCA, this study used an interpretive lens employing qualitative methods, more specifically constructivist grounded theory. To this end, data were obtained from 27 semi-structured interviews with purposively selected executives and senior management academics.

This paper commences by stating the rationale for the study, followed by the literature study pertaining to the concept of SCA in the context of the contemporary 4IR environment. The methodology employed in the study is then presented, followed by the findings and accompanying recommendations.

Rationale for the study

From the introductory comments, it can be concluded that in the current interconnected 4IR business environment, a CA is not sustainable but rather transient. Despite evidence that SCA is illusive, organisations relentlessly pursue it, and higher education institutions keep on teaching it. This dogged pursuit of SCA prevents managers and academics from exploring and capitalising on alternatives that greatly contribute to organisational success.

Considering the problem statement above, the following research question is posed: What is the impact of the exponentially interconnected world on the concept of sustainable competitive advantage and the consequent organisational business model?

From this problem statement and research question, the following primary objective for this study is forthcoming: To gauge whether the notion of sustainable competitive advantage is still considered relevant in an exponentially interconnected world of business.

Review of Relevant Literature

Critique of the SCA concept relies on an exploration of its definition and underlying assumptions, which is the starting point of the literature review. The discussion then turns to how the 4IR has changed SCA and concludes with possible reasons for its continued use by academia and business.

The (non) definition of sustainable competitive advantage

The ‘sustainability’ portion of competitive advantage (CA) was first introduced by Day (1984) who proposed superior skills and resources as strategies that may help to sustain the CA. Although Porter (1985) is universally accepted as the authority on SCA, he did not define the concept but only described how to achieve it through a barrier that prevents either competitor

behaviour or industry evolution to diminish its longevity. The lack of an explicit definition of SCA, according to Coyne (1986), is because the meaning is superficially self-evident. He, nevertheless, contributes to the SCA definition by describing it as the durability of product differentiation, as well as the inability of competitors' capabilities to deliver this differentiation. Barney (1991) asserts that the attributes resources must have to be a CA are valuable and rare. To 'sustain' this CA, two additional attributes are needed, namely imperfectly imitable (difficult to imitate by competitors), and non-substitutable. He added that organisations must have the ability to exploit valuable, rare and imperfect imitable resources to obtain a SCA. He continues to attempt a formal definition for SCA:

A firm is said to have a sustained competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitor and when these other firms are unable to duplicate the benefits of this strategy. (p.101)

This definition was expanded by Hoffman (2000) to include a longer time period to be sustainable, described as a "*prolonged benefit*" (p.6). It follows from the above definitions that two interconnected assumptions differentiate SCA from CA:

- barriers to competitive duplication
- an extended period of time.

Consistent with the authors on CA, writers on SCA continued to define this latter concept in terms of performance (Hill et al., 2015) and its sources (Maury, 2018) without expanding on the definitions advanced by Barney and Hoffman. This lack of a proper definition for SCA creates problems in strategic management, such as an inability to operationalise it or critique its use (Sigalas & Pekka Economou, 2013). This scholarly impediment is extended to practical applications, as managers are unable to define SCA objectively (Botes & Pretorius, 2020; Sigalas, 2015) but continue to describe and use it as a core tenet of strategic management.

Although there is no authoritative definition for SCA, there are some commonly recognised assumptions relating to it. By exploring SCA, it was noted that there are *three* major assumptions relating to SCA, namely stability, imperfect imitability, and imperfect mobility.

Stability implies limited competition, as dynamic competitors will find ways to counter an industry leader's CA (D'Aveni et al., 2010). The uniqueness of resources and the difficulty of competitors to imitate or substitute it, is called *imperfect imitability* (Costa et al., 2013). *Imperfect mobility* means resources are tradeable but are more valuable within the current business organisation and are specialised to the organisation's needs (Davis & McCarthy-Byrne, 2022). These assumptions are now under pressure from disruptive changes, and especially the 4IR. If there are changes to the SCA assumptions, it follows that SCA itself will be impacted.

Fourth industrial revolution and sustainable competitive advantage

New developments and technologies of the 4IR leverage the power of information technology and digitisation (Schwab, 2017). Digital technologies allow organisations to digitalise, which is the process of moving to a digital business. Digitisation (converting from analogue to digital processes) significantly reduces the cost of doing business, lowers the barriers-to-entry, and disperses industry boundaries (Coskun-Setirek & Tanrikulu, 2021; Sousa & Roucha, 2019). Liquid and transparent marketplaces are created (Achrol & Kotler, 2022), and bargaining power is shifted to the end-customer because of transparency and lower switching costs (Paulus-Rohmer et al., 2016). The consequence is an increase in competitors and customer-defection, who challenge the stability assumption of SCA.

Digitisation destroys sources of differentiation (Ferreira et al., 2019) and easily creates substitutes (Knudsen et al., 2021) which eliminates the assumption of imperfect imitability. Digitisation is a core facilitator of the business ecosystem, which provides abundant resources that companies do not have to own, but provide exponential growth (Ismail et al., 2023). New value propositions through the sharing economy, grant access to assets and products rather than ownership (Ritter & Schanz, 2019) and enable mobility of resources. Resources are now tradeable, which weakens the assumption of imperfect mobility.

Continued use of sustainable competitive advantage

The decline in the relevance of the underlying assumptions of SCA as highlighted above, and by extension the concept itself, has not translated to management practice as yet. The reasons for this are unclear and have not yet been explicitly addressed in literature. The authors, therefore, inferred the logic of the continued use of SCA by reviewing the literature on management training, management practices and business culture.

Management training focusses on theories of business strategy that explain the choices and approaches of organisations for obtaining a competitive position (Keig & Brouthers, 2013). The approach to current training supports classical theories with assumptions that the world is predictable, competition is stable, and CA is sustainable (Reeves et al., 2015). Current management training develops what Örtenblad et al. (2013) call replacers, managers that are narrow-minded, profit-centred and focussed on maintaining the current business practices and approaches, such as SCA.

Management practices focus on how management is socially and procedurally performed daily with specific reference to planning, development and implementation (Asmuß, 2018). Most of the 'tools' to perform these practices were developed with the assumption of a stable environment where SCA is gained through size, differentiation and capabilities. Although the business world has undergone significant changes since 2000, limited new strategy frameworks have been introduced to deal with these developments (Ghemawat, 2016). Only three strategy frameworks, which have some applicability in the 4IR environment, have

been developed since 2010: adaptive advantage (Reeves & Deimler, 2011), business model innovation (Lindgardt et al., 2013) and transient advantage (McGrath, 2013). The vacuum created by the dearth of appropriate tools for the 4IR, results in managers reverting to what they have been taught and what is available for use, which includes SCA as the measure of organisational success.

Business culture supports the concept of managerialism, which is the systematic rise of the management group that deprives owners and employees of decision-making powers (Shatil, 2020). According to Eagleton-Pierce & Knafo (2020), managerialism leads to the acceptance of its ideas without explanation and interrogation because it is seen as ‘common sense’. Klikauer (2015) uses CA as a specific example of an incidence in which an idea is used as a ‘catch-all umbrella’ to shift management thinking into a specific direction without questioning it. This is tantamount to SCA being elevated to ideology in organisations when tested against the five criteria of an ideology (Shrivastava, 1986):

- *Naturalisation of the status quo*: Change is resisted to maintain the dominant structures and order.
- *Factual underdetermination of action norms*: SCA is difficult to test but accepted as truth (Botes & Pretorius, 2020).
- *Denial of contradictions and conflict*: SCA is offered as a proxy for stability despite all indications that it is not relevant in a volatile changing world.
- *Universalising sectional interests*: Decisions about SCA are centred in top management, in line with Sison’s (2018) view that little input is obtained from other stakeholders.
- *Normative idealisation of goals*: The normative idealisation of the profitability outcome of SCA ignores the broader impact and consequences of relentlessly pursuing it, which has led to various business scandals.

Mapping SCA against the five criteria for an ideology reveals that it fits the application. Therefore, strategy as an ideology can be seen as one of the reasons why SCA is still being pursued by organisations despite its diminished relevance.

The literature review revealed that there is not one universally accepted definition for SCA but there are three generally accepted assumptions: stability, imperfect imitability and imperfect mobility. These assumptions and therefore, the SCA concept, are under pressure from the 4IR driven by digitisation. Despite all indications that SCA is questionable it is still taught and practiced. The reasons for this are unclear but might include management training focussing on obtaining a SCA, management practices relying on outdated and limited frameworks and a business culture that supports SCA as part of an ideology and managerialism.

Research Design and Methods

This study forms part of the PhD study embarked on by the first author of this paper and should be viewed in this context. The second author was not only the promotor of the PhD, but also an active co-author. The overarching study subscribes to the ‘science of understanding’ which underpins interpretivism. The science of understanding adheres to multiple realities, through which the world is seen as contextual, and new interpretations and underlying meanings are pursued (Goldman, 2016). The subject of the study, the relevance of SCA in the 4IR world, is relatively new and is therefore, well suited to an inductive approach and exploratory design, where theory is generated through data patterns (Saunders et al., 2019). In line with the chosen interpretivist paradigm, the study employed qualitative research methods where meaning was derived from the words (as transcribed) and not from numbers. Furthermore, the constructivist grounded theory method was used in this study, as it seems to be more flexible than some of the more rigid analytical approaches. (Charmaz & Thornberg, 2021). In addition, it allows for an appraisal of the literature and the crystallisation of a research question from the literature before research commences, in contrast to some more restrictive approaches to grounded theory (Corbin & Strauss, 2008).

In the context of this study, when trying to understand the relevance of SCA in the contemporary business environment, the insights of those who actively play a role in strategy formulation in organisations, as well as the insights of those who shape management education at higher education institutions, were essential in reaching meaningful conclusions. Using purposive sampling, these insights were obtained through semi-structured interviews (Reissner & Whittle, 2022) with 18 senior level managers and nine senior academics, thus 27 research respondents. Each of the 27 research respondents have more than 10 years’ work experience in their respective industries. In line with the grounded theory as a design choice, data were collected using theoretical sampling. Theoretical sampling continuously adds to the sample based on core themes emerging until theoretical saturation is reached (Chun Tie et al., 2019). Although data saturation was reached before the 27th interview, it was decided to interview all 27 research respondents to boost the credibility of the findings.

Interviews became more structured over time to explore emergent issues in more detail. Transcripts of the interviews, field notes and reflective memos written after each interview, were subjected to analysis to gain insight to each participant’s view and their relationship to the emerging collective view. Analysis of the data was conducted using a coding framework designed by Charmaz (2014). This coding framework consists of two phases, namely *initial* and *focussed* coding, which culminates in the development of a grounded theory. *Initial coding* involves disaggregation and labelling of data into conceptual units. An iterative process leads to a multitude of code labels, which are compared and grouped into broader categories. During *focussed coding*, initial categories are reanalysed and categorised into larger units. These

focussed categories are compared across interviews and core themes and relationships are developed into a theory.

Ethical Considerations

Full ethical clearance for the PhD study was obtained from the College of Business and Economics on 10 May 2021, (ethics clearance number: 21SOM25). Informed, written consent was obtained from each research participant involved in the study. Since humans were involved in this study, all procedures performed during the data collection phase of the study were in line with the ethical standards of the College of Business and Economics Research Ethics Committee of the University of Johannesburg, and the 1964 Helsinki Declaration, or comparable ethical standards.

Findings From the Study

During the coding process of the PhD study, 1420 code labels emerged. These were reduced to 298 during the first phase of focussed coding. Through further focussed coding, these codes were re-analysed and categorised into 22 groups, which finally crystallised into eight theoretical categories. Four themes emerged from these theoretical categories:

1. *No single uniformed understanding of the SCA concept*: There is an abundance of interpretations and varied understanding of the meaning and definition of SCA among business executives and senior management academics.
2. *SCA is mostly obsolete*: SCA as a core concept of strategy is mostly obsolete in the contemporary environment, as disruptive change has impacted its underlying assumptions.
3. *SCA is still pursued for various reasons*: Although SCA is seen as mostly obsolete, it is still pursued by organisations.
4. *Reaching beyond SCA*: Because SCA is mostly obsolete, it is necessary to explore alternative ways of outsmarting competitive rivals. Consideration should be given to disciplines beyond business management to achieve this.

One core category/theme emerged from all the data: 'A contemporary strategy framework rooted in complexity theory is needed to fill the SCA vacuum'. This core category formed the basis of the essential narrative presented in the PhD study.

In line with the interpretivist ontology of multiple understandings and meanings, interviews commenced with participants being asked to describe their understanding of SCA and its meaning for organisations, which resulted in Theme 1: No single uniformed understanding of the SCA concept. These views gave context to participants' thoughts about the contemporary relevance of SCA in strategic management resulting in Theme 2: SCA is mostly obsolete. This paper focusses on this second theme because it forms the foundation for Themes 3 and 4. Only after understanding the relevance of SCA can sense be made of the

reasons for its continued use (Theme 3), as well as exploring the need for alternatives to replace SCA (Theme 4). Excerpts from interviews are used as supporting evidence. More evidence is available upon request from the authors.

SCA is mostly obsolete emerged from exploring the research question regarding the impact of the exponentially interconnected world on the SCA concept and on the organisation's business model. Participants opined that disruptive change creates effects far beyond the organisation's business model, including strategy, culture and skills which, in turn, impact the underlying assumptions of the SCA concept. These relational connections (Figure 1) are explained in the subsequent sections.

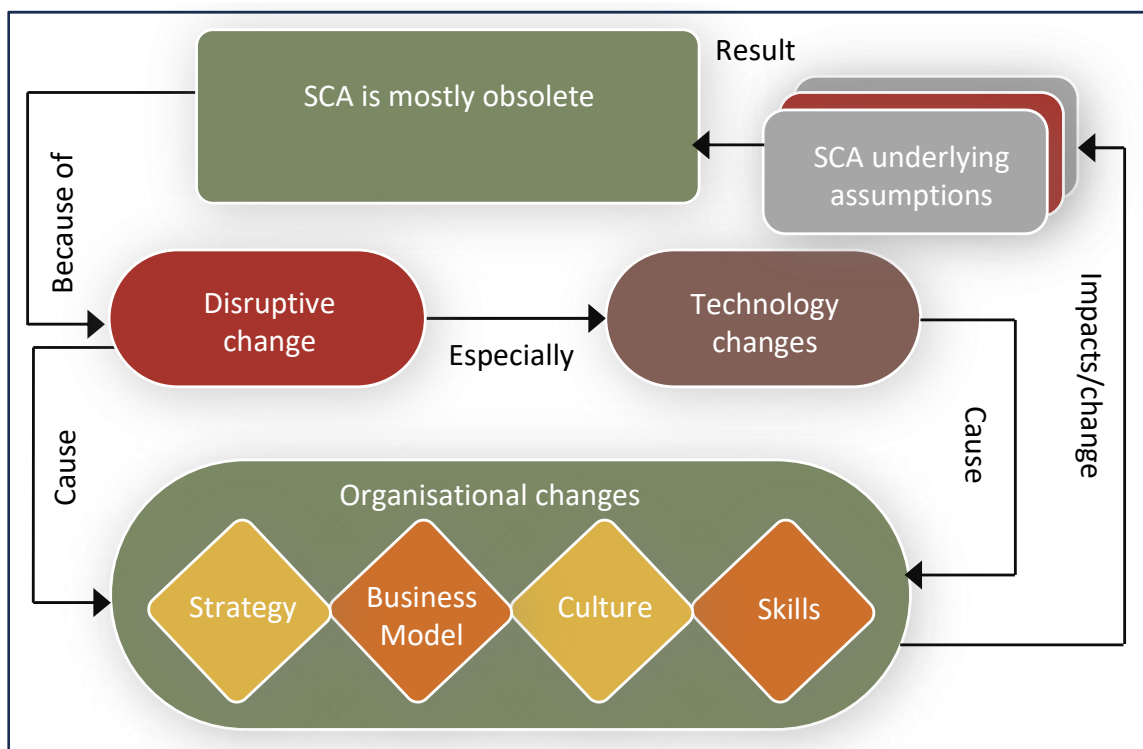


Figure 1. Relationships of key findings of the theme: SCA is mostly obsolete

Source: Researcher's own design

For purposes of the discussion in this paper, each of the relationships will be presented as a theme, starting with SCA is mostly obsolete, followed by disruptive change that diminished the relevance of SCA. The resultant organisational changes questioning the SCA assumptions are discussed as the final theme.

Theme 1: SCA is mostly obsolete

The views of participants on the contemporary relevance of SCA were grouped into three major sub-themes: SCA is not relevant, SCA has qualified relevance and SCA is still

relevant. There were no discernible differences in views observed between industry participants and academics.

Sub-theme 1: SCA is not relevant

The majority of participants strongly indicated that SCA as a concept in strategy and business management is no longer relevant. Most participants were very emphatic in their assertions, as seen from the quotes (Figure 2). Some of the participants who do not think SCA is still relevant, started to touch on the reasons for their assertion, highlighting the short timeframe of any advantage in the dynamic interconnected world. As such, they concur with the research findings pertaining to high-velocity markets in which organisations are in constant change and processes are less structured with high reliance on new and situational information (Li et al., 2019). Hyper-competition makes it difficult to sustain a CA owing to rapid innovation and shortened product life cycles and, as such, competitive advantages are temporary (Lindskov et al., 2021).

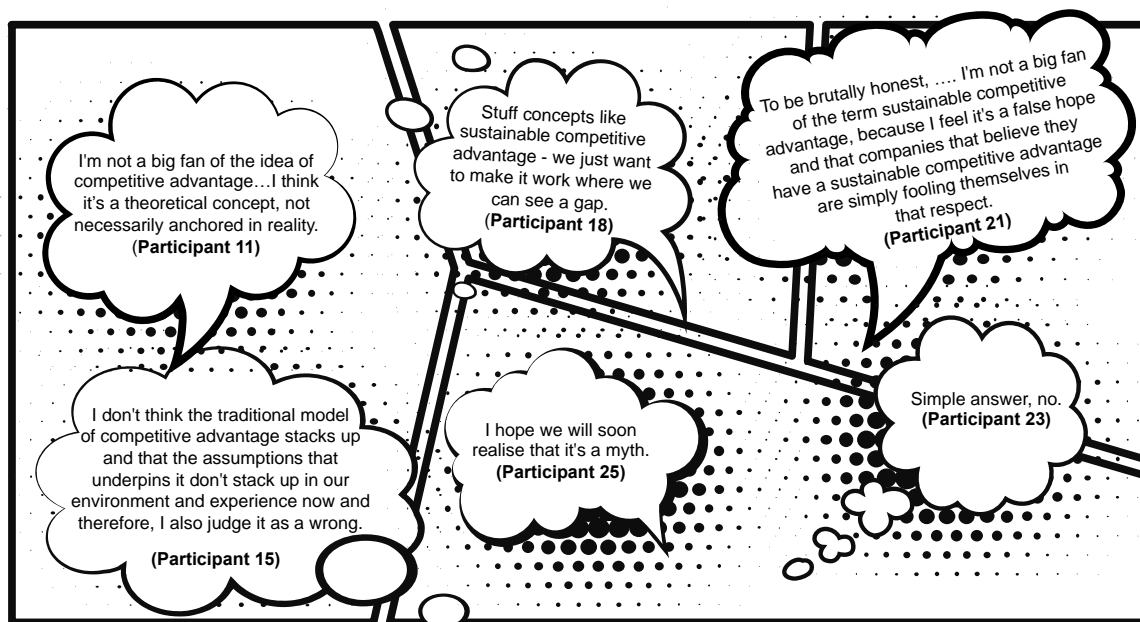


Figure 2. SCA is not relevant in contemporary business management

Source: Participants' quotes

Sub-theme 2: SCA has qualified relevance

Notable among those participants who initially stated that SCA is still relevant, was that they almost immediately qualified this comment by questioning the generally accepted underlying assumptions of SCA, being stability, imperfect imitability and imperfect mobility. Participants might have just accepted the relevance of SCA without questioning it and as the discussion progressed, they modified their original position (Figure 3).

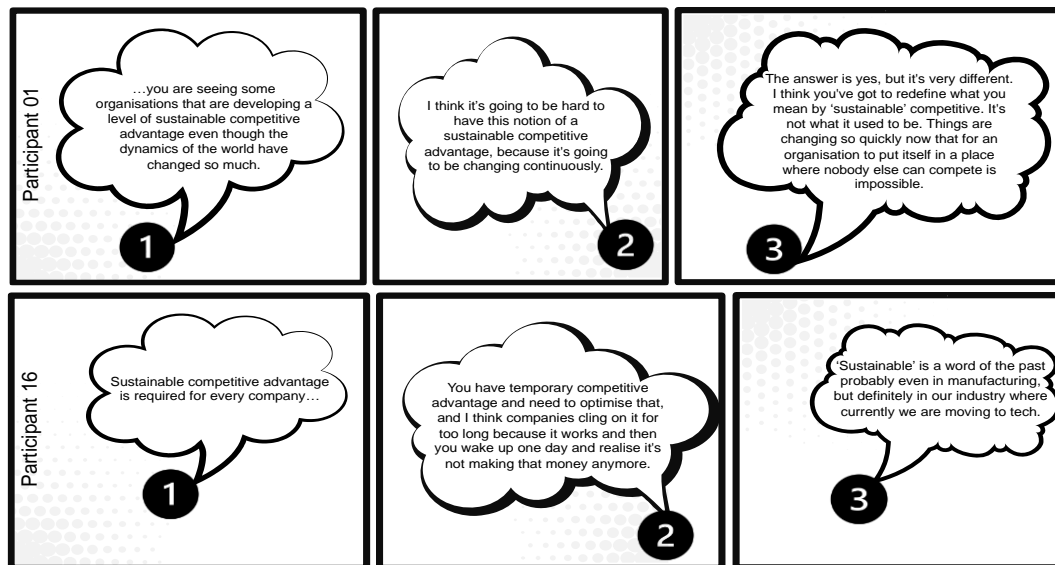


Figure 3. The relevance of SCA evolved during conversations

Source: Participants' quotes

Sub-theme 3: SCA is still relevant is a minority view

The minority of participants were of the opinion that SCA is still relevant because without it a business will cease to exist, it will not make profits and will become irrelevant. It was noted that there is no real alternative to SCA and therefore, it is still relevant (Table 1).

Table 1. Minority views on the relevance of SCA

Participant #	Quote to support SCA relevance	Reason for endorsing SCA
02	"Yes, I think it is... sustainability for me is linked to continuously enhancing and improving, the products and the services and the systems and the digitalisation that goes with those things that you are offering."	Continue to evolve as a business.
07	"Oh, it's the only relevant thing... If you're not building a sustainable competitive advantage of some sort, you're going to be out of business, quite frankly."	Creating value to stay in business.
10	"The other part about sustainability, I think, is continuing to be relevant...So, the other reason of sustainability is being relevant to the current products and services and at the same time find the right pathway to get through that which we were always doing."	Stay relevant in the market.
14	"I think it's very relevant. So, sustainability is asking: Am I relevant to the marketplace and have I morphed my capabilities to continue to make a profit?"	Making profits.
19	"I reflected on: Is it really still applicable? And for me, it's a resounding yes. But the question is, if not a competitive advantage, what then? If we don't have that, what do we have to sustain the business, because our organisation cannot just function on year-to-year performance, there must be something that will take them over the long term in the future and take care of the stakeholders."	No real alternative.

Source: Analysis of participants' quotes

Theme 2: Disruptive change has diminished the relevance of SCA

Disruptive change is relational to the relevance of SCA because it results in organisational changes that impact the underlying assumptions of SCA. Disruption is defined by Kivimaa et al. (2021) as:

... a high-intensity effect in the structure of the sociotechnical system(s), demonstrated as long-term change in more than one dimension or element, unlocking the stability and operation of incumbent technology and infrastructure, markets and business models, regulations and policy, actors, networks, and ownership structures, and/or practices, behaviour, and cultural models. (p.119)

Given the timing of the research, the COVID-19 pandemic was only superseded by technology as a category of disruptive change. The findings on disruptive change are grouped into three sub-themes:

- technology
- social (socio-economic, socio-political, consumer power, government actions, culture)
- environmental (Covid, ecological environment).

Sub-theme 1: Technology is the pre-eminent disruptive change for SCA

Participants explained the disruptive force of technology in general. Almost all then continued to provide examples of specific impacts of 4IR technologies (Figure 4):

- 3D printing as a form of additive manufacturing in contrast with conventional manufacturing which is subtractive (Jadhav & Jadhav, 2022). “You would make a mould and do injection moulding and you can go from concept to prototype in a 3D environment, increasing speed to market.” (Participant 14).
- Cloud computing as a system that is scalable and accessible anywhere and provides, as needed, access to technology services and resources. “I think the one biggest thing that disrupted the world over the last decade, is the fact that you must be cloud based.” (Participant 09).
- Artificial intelligence (AI) that can perform tasks, which are usually within the human intelligence sphere, such as visual perception, speech recognition and language translation. “AI just makes everything far easier to manage... AI then frees up the people to think of new ways of doing things differently that can then be automated.” (Participant 02).

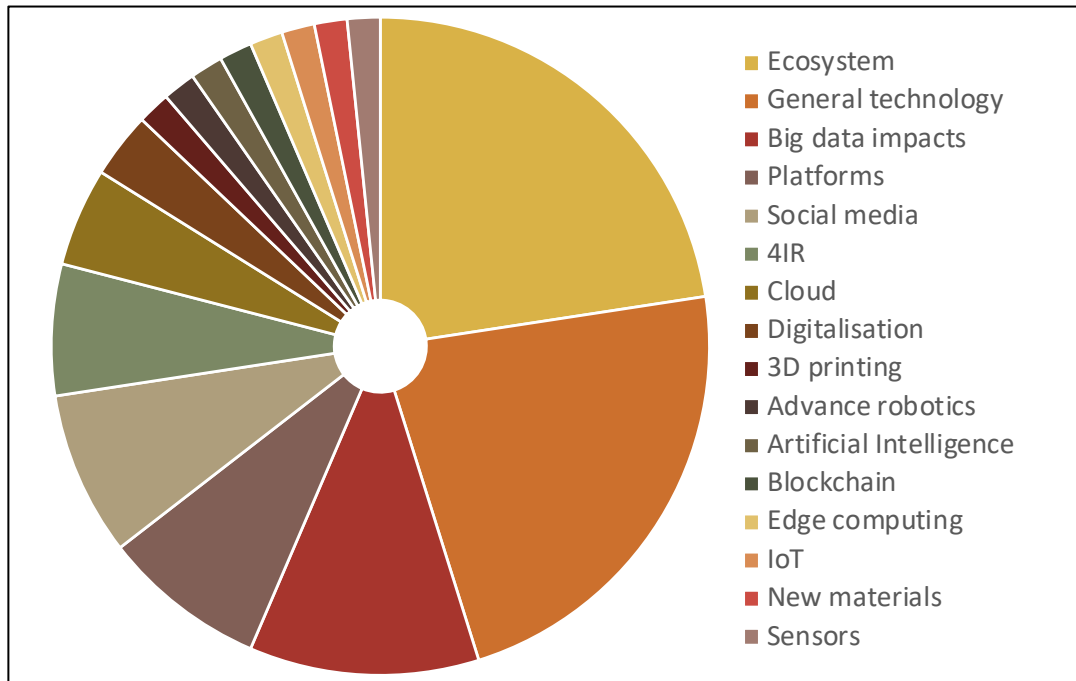


Figure 4. Examples of technologies causing disruptive change

Source: Analysis of the participants' interviews

Ecosystems created by platforms received special mention as a primary driver of the digital economy (Figure 5).

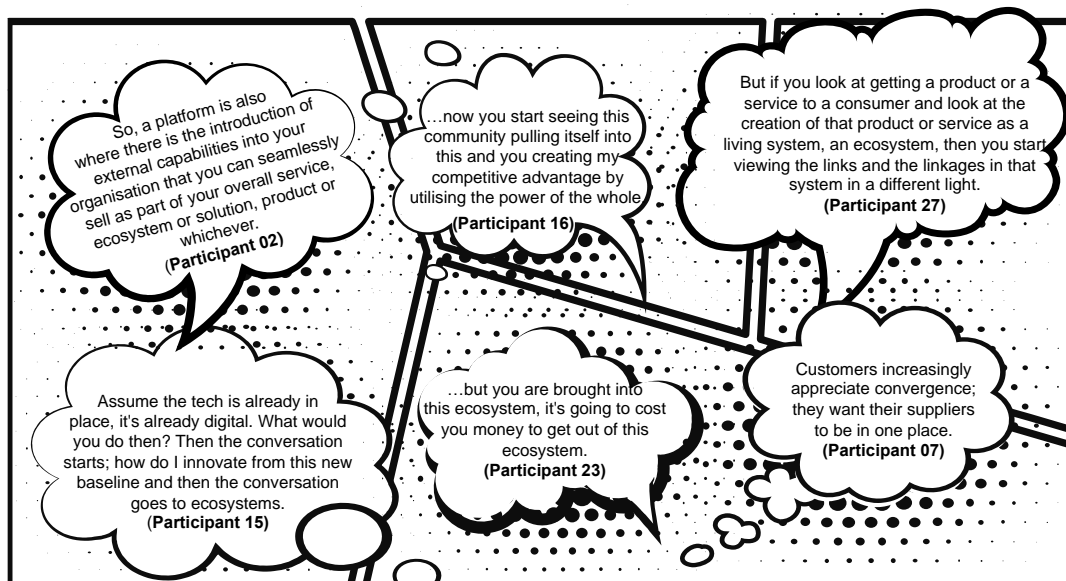


Figure 5. Platforms and ecosystems are drivers of disruptive change

Source: Participants' quotes

Digitisation allows for the creation of digital platforms, which replace the traditional seller-buyer relationship and are linked to various partners that work cooperatively to deliver value. The modular structure of digital platforms allows for a recombination of new services into ecosystems (De Reuver et al., 2018). This ecosystem creation was touted as a major technology disruptor. Organisations should now be viewed as part of an ecosystem that crosses industry boundaries and is no longer a member of a single industry.

Sub-theme 2: Social drivers of disruptive change

Social drivers, as the interaction among social, economic and political factors, are arranged into three clusters: changes in consumer power, changes in the nature of work, and changes in how one does business, as represented by born global businesses.

Consumer power is increased over time as a result of the sophistication of digital interactions (Labrecque et al., 2013). This increase in consumer power is seen as a driver of disruptive change, which shifts the focus of any SCA from an internal organisational view (which is controllable) to an external consumer (which is less controllable). "I therefore think the sustainable competitive advantage is moving away from the organisation into the hands of the market, the consumer." (Participant 01).

The nature of work has changed since the strong move from the manufacturing economy to the service economy over the last few decades. The gig-economy deals with service delivery through consumer-to-consumer interaction and includes purchasing personal services (Frenken & Schor, 2017). The gig-economy changed the nature of work, allowing for flexibility, work-life balance, and part-time work during adverse conditions, such as the COVID-19 pandemic. "This concept of gig-economy, hustlers are becoming more common...which is a concept that scares people who want stability." (Participant 13).

The emergence of born global organisations causes a shift in how business is done by moving the focus from the larger multi-national firms to newer, smaller organisations (Hennart et al., 2021). Born global means organisations serve clients worldwide, compete or create global markets from the start, focus on growth potential and respond at speed to global demands. "It's interesting that globalisation, at times in our industry is a market force that opens the door for us because data sovereignty requirements are opening the door for us to deploy our solutions in country." (Participant 17).

Sub-theme 3: Environmental drivers of disruptive change

Climate change has been identified as one of the central sources for zoonotic diseases, being diseases that spill over from animals to humans, such as COVID-19 (Nath et al., 2021), which was a major concern for most participants, with numerous mentions of it being a disruptive force. "I think what the pandemic did for us was to amplify those disruptive changes that were happening anyway, but we were ignoring because we were just running in the hamster wheel." (Participant 18).

Theme 3: Organisational changes are a consequence of disruptive change

The impact experienced by business is pervasive, and almost in equal measures on strategy, business model and culture.

Sub-theme 1: Strategy changes impact SCA

Digitalisation, as a driver for disruptive change, modifies the strategic context, reshapes competition and the implementation of strategies through which organisations traditionally created a SCA. Participants expressed changes in the strategic context of organisations in three clusters: markets, competition and products or services.

Markets are impacted by increased ambiguity because of fast and fluid cycles and changing customer expectations. Higher levels of transparency allow for increased consumer power impacting market structures. The competitive landscape is in perpetual motion with boundaries being lowered and blurred. "...business models and business lines are also becoming a lot more merged, so you can't say, I'm a bank, and that's all I'm going to be. Lines are becoming a lot more blurred; industries are crossing into other industries. If you look at how most mobile operators are disrupting banking, as well as insurance operators." (Participant 13).

The increased competition and changing customer-power diminishes the SCA assumption of stability. Digitalisation has allowed for the development of new products that blur product boundaries (Koch & Windsperger, 2017) and erode imperfect imitability as a SCA assumption. This is best explained by Participant 14 describing the evolution of a civil engineering business (Figure 6):

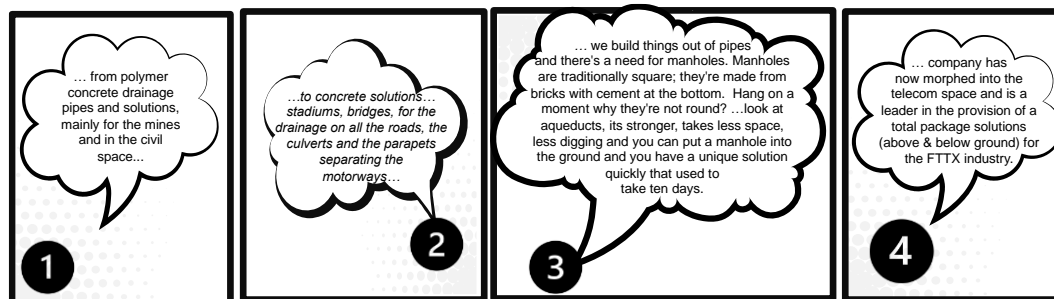


Figure 6. Example of the evolution of new products

Source: Adapted from Participant 14's description of new products

Sub-theme 2: Business model changes impact SCA

Changes were identified across all the elements of the business model (Figure 7), with changes in the value proposition highlighted.

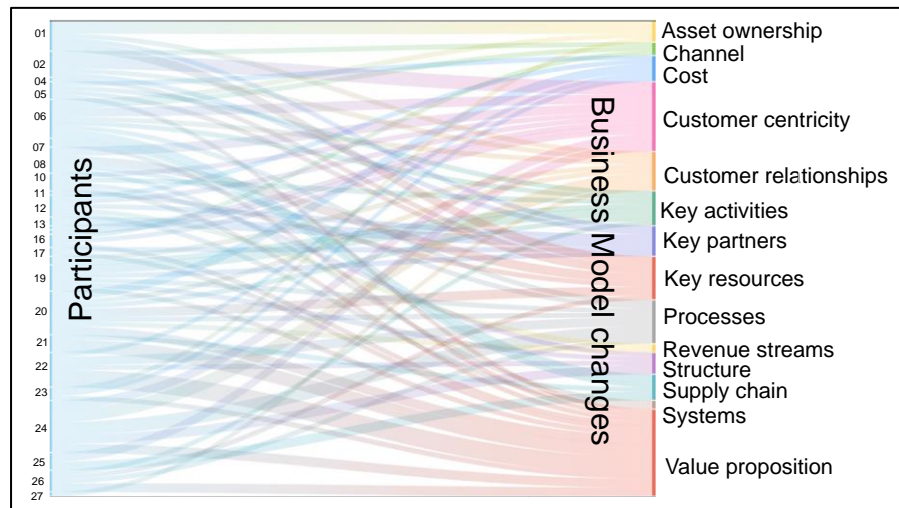


Figure 7. Impact of disruptive change on business models

Source: Researcher's analysis of the participants' interviews

Traditionally, value was added to products by increasing the product features, a practice that was seen as adding quality that could demand a higher price. Through digitisation a product's nature changes into separate components with an independent value, which can then be used in different combinations because the product boundary is no longer fixed. Value in the digital environment is co-created by multiple stakeholders. This permits increased innovation and value propositions to change from products to services, and provide customisation (Prem, 2015).

The relationships organisations have with their customers have changed significantly because of the shift in consumer-power. By using AI, big data and customer analytics enables greater customer segmentation sophistication. This is achieved by using real-time data available from a range of digital touchpoints which establish complex customer patterns (Ballestar, 2021). Collecting and analysing these different forms of data, achieves a better understanding of consumer behaviour, and makes better segmentation possible (Lo & Campos, 2018). As digitalisation increases, it enhances the opportunities for interaction with customers. Participant 09 described the change in relationships from directional to multifaceted and even the co-creation of the marketing of content-evolution (Figure 8):

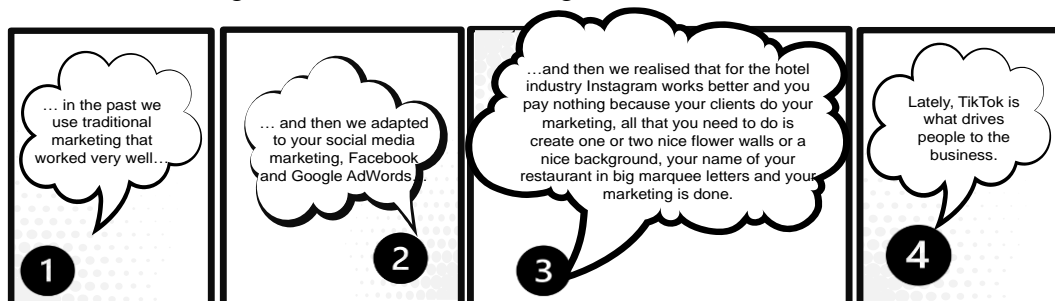


Figure 8. Co-creation as a result of disruptive change

Source: Adapted from Participant 09's description

Channel integration has broken down the silos between online and offline channels, allowing consumers the flexibility to select providers with configurations that match their preferences (Trenz et al., 2020). All these channels are worthless if not properly enabled by processes and people. Digitisation facilitates highly automated processes that increase speed, efficiency and flexibility. A major impact of digitalisation is the disintermediation of the value chain, through which customers can be directly reached without intermediaries (Wirtz, 2019). Participant 11 described how customers use their products on a pay-as-you-go basis without signing up for premiums through an intermediary. Participants also confirmed that to deliver to their customers their organisations are subscribing to a broader partner concept (Figure 9).

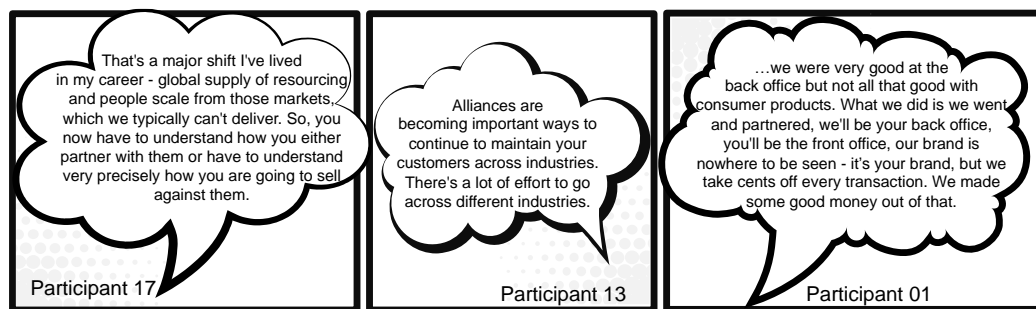


Figure 9. Impact of disruptive change on key partnerships

Source: Participants' quotes from the interviews

To maximise digital technologies, investment in human resources with the correct technical and digital skills is required. The participants shared their practical experience of highly sought-after skills (Figure 10). Most agree that a combination of both technical and soft skills is needed to manage disruptive change.

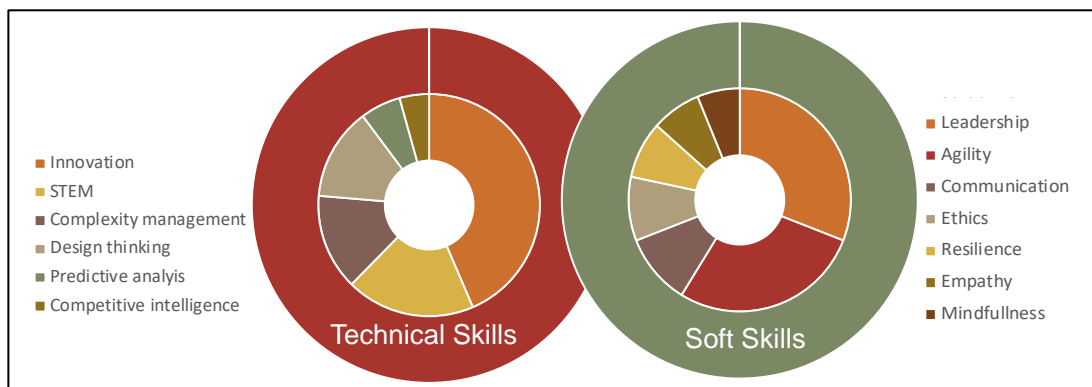


Figure 10. Skills required in the disruptive, interconnected business environment

Source: Researcher's analysis of the participants' views on skills required

These changes to the business model increase the mobility of resources, expand alternative substitutes and diminish the uniqueness of a SCA.

Sub-theme 3: Culture changes impact SCA

Culture is the combination of artifacts, attributes, values, beliefs, norms, standards, and practices in an organisation (Martínez-Caro et al., 2020). The study's findings on the impact of culture, are closely linked to the new skills identified by the participants needed in a disruptive 4IR world (Figure 10). Agility means a quick response to business disruptions, as well as opportunities connected to continuous learning (Ulrich & Yeung, 2019). The move to ecosystems demands more communication, collaboration, trust and transparency (Figure 11). Collaboration, as a joint effort to achieve a common goal, requires significant interdependence in the design of work efforts and a focus on achieving value through the synergy of diverse talents found in teams (Castañer & Oliveira, 2020).

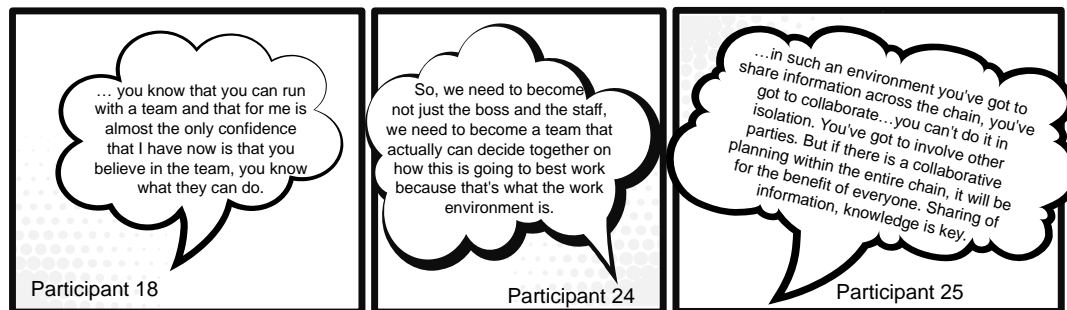


Figure 11. Ecosystems demand collaboration, trust and transparency

Source: Participants' quotes from the interviews

There is little appreciation for central control because work is more fluid and organised around 'jobs to be done' and not people. Competency is valued above authority and a culture of autonomy and mastery is becoming more prevalent. Working globally and in diverse cultures necessitates culture intelligence, which is the understanding of different cultures and adjusting to such norms based on this knowledge:

We do work multi-nationally so cultural intelligence...we've had the same people on EQ training that helps with the development of cultural intelligence and being more empathetic and understanding of different cultures... Embracing of cultural differences to deliver globally was one of the biggest changes that I've seen. (Participant 17).

It was highlighted by the participants that if the culture changes are not accommodated in organisations, one will see more of the 'big resignation' phenomenon that started during the COVID-19 pandemic:

In terms of people, I think that's why you have the 'big resignation'. It's because those people that can think more openly, can connect dots, that are more into complexity thinking, are feeling so stifled by your senior management that thinks more in boxes, and they are jumping out more, moving between businesses and becoming more entrepreneurial. (Participant 18).

Discussion of findings

The major conclusion from the study is that SCA as a strategic management concept is mostly obsolete. The business environment has significantly changed since the first introduction of SCA in management theory and practice. These changes have largely been driven by digitisation in the 4IR. New technology, through digitalisation, is the clear frontrunner for disruptive change with technologies, such as platforms, 3D printing, artificial intelligence, blockchain, cloud computing, IoT and advance robotics impacting organisations.

The organisational impacts experienced by businesses are pervasive and in almost equal measures on their strategy, business model and culture (Table 2). Strategy areas impacted, include the change in market structures by lowering barriers-to-entry through technologies that are cheaper, standardised and modularised. Technologies, such as cloud computing and online-marketing platforms, are globally available and level the playing field for smaller organisations. Transparency and lower switching costs shift bargaining power to the end customer. Competition increases as sources of differentiation are diminishing and competitive boundaries dissolve with the adaption of ecosystems. Products are becoming more customised by leveraging big data and cloud computing. Business models are impacted because new value propositions are created through the sharing economy, which grants access to assets and products rather than ownership. Big data assist with customers' understanding and segmentation by analysing complex customer patterns. Channel integration allows businesses to meet the consumers 'where they are'. Platforms that create ecosystems are becoming the norm, which assist businesses to 'buy-in' expertise rather than cultivate their own resources to serve the customer end-to-end. The culture changes are linked to the complexity of an ecosystem where command and control are inappropriate to manage work across functions, organisations, individuals and where achieving results is a collaborative effort. Ecosystems inherently abhor silos as these function across boundaries to achieve success. The consequent result is that teams and autonomous peering is more important than central authority.

The three core assumptions of SCA: stability, imperfect imitability and imperfect mobility are challenged by these disruptive changes as follows:

- Stability: The business environment is experiencing high levels of uncertainty and pervasive competition.
- Imperfect imitability (uniqueness and the difficulty to substitute): Convergence and participatory platforms increase transparency; products are unbundled, developed at speed and cheaper, which makes it easy to imitate and substitute.
- Imperfect imitability (tradeable but more valuable in current organisation): Asset-ownership has been replaced by asset-access by the sharing-economy. Remote work needed for especially skilled resources has become a norm which increases mobility between organisations or own employment as seen through the gig-economy.

Table 2: Examples of the impact of how digitisation and technology of the 4IR impact the organisation

	Examples of the impact of digitisation and 4IR on the organisation
Strategy	<ul style="list-style-type: none"> - Lower barriers to entry increase competition. - Industry boundaries being blurred through ecosystems. - Expanded market-reach through technology. - New markets, such as sharing economy is created through platforms. - Asset ownership no longer needed – access through sharing. - Liquid and transparent markets are created shifting bargaining power. - Diminished sources of differentiation through digitalisation. - Increased customisation of products using big data. - Design for edge using cloud computing. - Servitisation – moving from product to service. - Embedded intelligence in products feeding big data for decision-making.
Business model	<ul style="list-style-type: none"> - Increased value proposition by moving from products to services and providing customisation. - Big data analysis allows better customer understanding and building of relationships that are multifaceted. - Integration of physical, web-based, and mobile channels to create an omni-channel customer experience. - New skills (both technical and soft) are needed. - Alliances to create customer value – one place to serve the customer needs. - Disintermediation of the value chain, where customers can be directly reached without intermediaries. - Customisation created the ‘segment of one’ and as such, individualised pricing is on the rise.
Culture	<ul style="list-style-type: none"> - Agile to respond faster. - Competency is valued above authority and a culture of autonomy and mastery is becoming more prevalent. - Collaboration, trust, transparency. - Team-focussed. - Culture intelligence across boundaries to deliver value-add.

Source: Synthesis from the study findings

The underlying assumptions of SCA are challenged, are no longer relevant and therefore, the relevance of the SCA concept itself is contested. The interpretation of the major findings results in the conclusion that SCA as a core concept of strategy is mostly obsolete, therefore, SCA should no longer be promoted as a key concept in the industry and academia. Alternatives to SCA must be taught and implemented that subscribe to a complex interconnected business environment.

Contributions

The study enhances the body of knowledge in business management and strategic management by:

- Bolstering the critique on the continued use of SCA in contemporary business management.
- The impact of disruptive change of the 4IR on the underlying assumptions of SCA are the first to provide a direct explanation of why these SCA assumptions are no longer relevant.
- Offering additional insights on the most relevant disruptive changes in an interconnected business environment which impacts SCA.
- Highlighting the impacts of disruptive change on an organisation's strategy, business model design and culture, and therefore, SCA.
- Giving organisations sight of potential irrelevant SCA assumptions being used for strategies and plans.

Limitations and avenues for future research

Abundant data from the interviews provided richness to the findings and significance to the research. However, there were limitations that are related to this exploratory and qualitative study. The limitations provide an opportunity to expound on possible areas for future research. Purposive sampling was used and although efforts were made to include more diverse backgrounds (gender orientation, ethnicity, geographic location) the majority of the participants reflect the current management structures in organisations dominated by males. Although data saturation was reached before 27 interviews in accordance with the grounded theory design, a larger group of participants may be needed to validate the findings. The study was conducted in one of the most extreme disruptive changes our generation has ever experienced, being the COVID-19 pandemic. The results might have been influenced by participants' real confrontation with possible death. This fact might make one more reflective in terms of what is important. With the subsiding of this real threat, results may be different if the same or a similar study is conducted, thus, an environmental comparative study might be an avenue for future research.

Concluding Remarks

The underlying assumptions of SCA: stability, imperfect imitability and imperfect mobility have proven to be an illusion in a 4IR business world, where especially digitisation has disrupted the strategy, business model and culture of organisations. The consequence is that SCA, as a management concept, has become mostly obsolete. Therefore, academics and practitioners alike, should stop promoting it as a core concept for organisational success. Because SCA is still such a core concept for the development and execution of strategy, its demise is leaving a vacuum which should be filled by alternatives that address the complexity of the interconnected 4IR business environment. Although this paper's focus was on the theme "SCA is mostly obsolete" it is prudent to conclude with some of the proposed alternatives which emerged through the PHD study to fill the vacuum left by the decline of SCA. A wide

variety of concepts, reasoning principles, and disciplines were identified as alternatives to SCA as seen in Figure 12. These were grouped into alternatives to the competitive focus of SCA (collaboration, cooperation, purpose), alternatives for definitions of success (common good, relevance, value creation, significant impact) and alternatives to the binary logic of SCA as a reasoning principles (agility logic, complexity logic). If there are changes to all of the aforementioned it follows that there will be changes in any tool or framework that uses SCA in one form or another. To further assist with generating alternatives, one should look beyond the business management discipline for relevant inputs in line with the DeMedici Effect that postulates that high impact innovations happen at the intersection of fields, disciplines and cultures (Bogers, et al., 2018). Many and varied alternative disciplines, including additional branches of the social sciences, natural science, formal sciences, arts and spirituality, were offered to supplement economic theory in business management. From these disparate suggestions one can deduce that the contemporary business management discipline with its accompanying frameworks and tools is not, by itself, adequately addressing the complex business environment in which the study participants teach and practice.

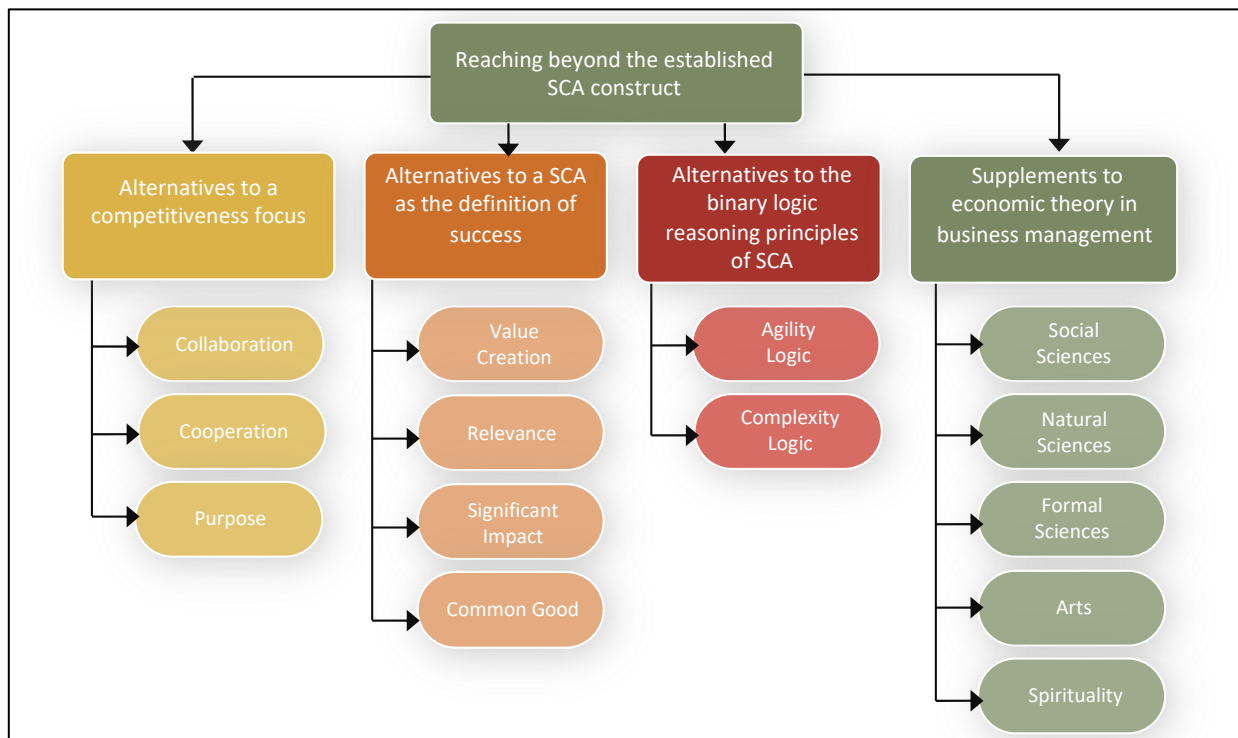


Figure 12. Alternatives to sustainable competitive advantage

Source: Researcher's analysis of the participants' views on alternatives

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MACHINE LEARNING FOR CONCRETE SUSTAINABILITY IMPROVEMENT: SMART FLEET MANAGEMENT

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Abstract: *In the dynamic landscape of modern business operations, ensuring economic security through efficient and intelligent fleet management is imperative. This necessitates a dual focus on safeguarding revenue streams and optimizing operational costs. The aim of this study centers on two main objectives: first, to identify driving behaviors that have a substantial impact on vehicle maintenance costs; second, to ensure the sustainability of the fleet is managed effectively. To achieve these objectives, the research employs unsupervised Machine Learning (ML) techniques for segmenting driving styles based on diverse parameters collected from Internet of Things (IoT) devices. Furthermore, the Long Short-Term Memory (LSTM) algorithm is used for forecasting fuel consumption, offering a predictive glance into future expenditures. The methodology is based on the analysis of data gathered from sensors installed on the vehicle's Controller Area Network (CAN), collected over a span of five months. The findings spotlight a subset of drivers whose aggressive driving significantly influences maintenance costs and highlight optimal indicators for drivers to monitor to minimize CO₂ emissions. Additionally, the study identifies key performance indicators that drivers should monitor to reduce CO₂ emissions, contributing to the environmental sustainability of the fleet. This investigation not only elucidates the financial and environmental implications of driving behaviors but also showcases the transformative potential of ML technologies in enhancing the strategic management of vehicle fleets. Through this exploration, the research advocates for the integration of advanced analytics and sustainable practices as foundational elements for businesses striving to achieve economic security and operational resilience.*

Keywords: *driver behavior, fleet sustainability, unsupervised machine learning, clustering analysis, CO₂ forecasting.*

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Introduction

In the recent period, there has been a notable increase in research and studies focused on identifying driver behavior. This surge is evident in efforts to devise optimal solutions for autonomous vehicles as well as to protect individuals and society by reducing traffic incidents and promoting eco-friendly driving habits that decrease harmful emissions. Many of these studies rely on data samples from driving simulators, examining specific aspects of driver behavior, such as

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overtaking maneuvers, in controlled conditions. The objective of the current research was to explore how Machine Learning (ML) can be utilized to discern real-world driver behaviors in traffic—beyond simulator data—to identify patterns that adversely affect a company's budget. Another aim of this study is to estimate future emission reductions achievable by the company's vehicle fleet, providing insights for management to keep emissions below a certain threshold and steering the company towards sustainability in terms of CO₂ emissions.

The data utilized in this study were collected in real time using sensors installed on a sample of nine vehicles from the fleet. The substantial volume of data gathered enabled a multifaceted analysis of driving behavior by integrating various dimensions and utilizing a mix of indicators and input variables. These included parameters such as cornering speed, the frequency of undercarriage impacts, the number of braking events at speeds exceeding 60 km/h, and the volume of CO₂ emissions over a specified time interval. This comprehensive approach facilitated a detailed examination of driver behavior patterns and their environmental impact.

Moreover, the sensors equipped on the vehicles were capable of recording a wide range of impacts that occurred on various parts of the vehicle, including frontal collisions, side impacts, overhead strikes, and impacts from below. The granularity of this data, capturing not just the occurrence of such impacts but also their intensities, added another layer of depth to the analysis. This nuanced data collection enabled the study to pursue multiple segmentation directions, categorizing vehicles not only based on driving style but also according to the volume and intensity of incidents impacting the vehicle. This dual-axis segmentation offered a more holistic view of driver behavior and vehicle usage patterns, shedding light on potential areas for operational improvements and risk mitigation strategies.

The findings of this research are promising regarding the identification of driver patterns that negatively impact company profitability. However, in terms of forecasting emissions, the study is inconclusive. Despite the application of advanced forecasting methodologies, such as Long Short-Term Memory (LSTM) networks, known for their capacity to handle sequence prediction problems effectively, the study does not succeed in establishing a robust model for emissions forecasting. This outcome suggests a gap in the predictive capability of the current model, underscoring the necessity for additional research and refinement of forecasting methodologies. Expanding the volume of data could provide a more comprehensive foundation for the model to learn from, capturing a wider array of driving conditions and emissions patterns. Additionally, refining the granularity of the data might allow for a more nuanced understanding of the relationship between driving behaviors and emissions, facilitating the development of a more accurate and predictive model.

This research progresses through several structured sections. Initially, in Section Two, a comprehensive review of relevant literature is provided. This section sets the stage for understanding the context and significance of the current research within the broader academic landscape.

In section Three, the methodologies and models used in the study are detailed. This part explains the choice of Machine Learning (ML) techniques, including unsupervised learning for driver segmentation and neural networks for fuel consumption prediction. The choice of unsupervised learning is highlighted due to its effectiveness in identifying patterns within the data without the need for pre-labeled instances. This method facilitates the segmentation of drivers into distinct groups based on their driving styles, enabling targeted interventions for improving fuel efficiency and reducing emissions. Strategies such as data preprocessing, feature selection, and normalization are implemented to prepare the dataset for analysis, ensuring that the ML models can learn effectively from the data.

Section Four offers a detailed presentation of the dataset, including the calculated indicators, accuracy rates, and findings of the case study. It provides a comprehensive look at the dataset, describing the data collection process through sensors, the variables measured, and the methods used to maintain data accuracy. This section transitions from the technical aspects of data handling to the analysis of calculated indicators, accuracy rates, and case study findings, offering a clear view of the research outcomes. In addition to these aspects, significant attention was placed on testing the models and strategies to identify the optimal model by analyzing performance indicators. This involved a detailed examination of various models to evaluate their effectiveness in capturing the nuances of the dataset and accurately predicting outcomes. A key focus of this evaluation was on combating overfitting and underfitting, ensuring that the models neither overspecialized on the training data nor remained too generalized to make accurate predictions.

The pivotal results of this study reveal a distinct segment of drivers characterized by a less cooperative driving style, leading to increased fuel consumption, an increased frequency of car incidents, and a greater likelihood of requiring premature car maintenance. These findings have significant implications for operational efficiency and environmental impact.

To address these challenges, the study suggests the implementation of specific Key Performance Indicators (KPIs) aimed at changing driver behavior and reducing company losses. This recommendation is based on the analysis, having the final scope to improve driver cooperation, decrease fuel consumption, and lower incident rates. The discussion on KPIs not only suggests solutions to the observed problems but also encourages future research and practical applications to enhance safety, sustainability, and efficiency in fleet management.

Literature review

The literature reviewed in this research is organized into three categories: Driver Behavior Analysis and Safety, Machine Learning in Transportation and Logistics, and Innovative Technologies for Traffic and Vehicle Management. This structure aids in systematically examining the existing studies and approaches within these areas. By organizing

the literature this way, the review sets out to cover the broad spectrum of knowledge, from understanding driver behavior and ensuring safety to the application of machine learning for optimizing transportation and logistics, and finally, to exploring innovative technologies for better traffic and vehicle management.

Papers in the category of Driver Behavior Analysis and Safety focus on understanding and classifying driver behavior using machine learning and statistical analysis. They aim to enhance road safety and driving efficiency, examining factors like aggressive driving, fuel consumption, and driving patterns in different scenarios such as highways, roundabouts, and signalized intersections. One of the papers (Raman & Anuj, 2022) focuses on using machine learning to analyze and classify driving behavior based on vehicle On-Board Diagnostic (OBD) data. It explores how various driving parameters can indicate different driving styles and their impact on vehicle performance and safety. The study utilizes Support Vector Machine (SVM) and AdaBoost algorithms for classification and demonstrates high accuracy in distinguishing among diverse driving behaviors. This research contributes to understanding driver behavior patterns through telematics and machine learning, offering potential applications in vehicle safety systems and driver coaching tools.

A novel framework is proposed, designed to detect road rage and aggressive driving using GPS and heart rate data (Subramanian & Bhargavi, 2023). The proposed framework integrates GPS data to track vehicular movement and heart rate monitoring to assess the driver's physiological state, indicative of stress or aggression levels. The approach utilizes machine learning classifiers to categorize drivers and demonstrates the potential of this system in real-world applications. The findings from this research underscore the potential of integrating technology with behavioral science to improve road safety and tailor insurance premiums more accurately to individual driving habits.

A novel approach to urban traffic planning and safety improvements (Tasnim & Huthaifa, 2022) focuses on analyzing the impact of roundabout design on driver behavior using machine learning techniques. The study aims to categorize drivers into different behavior profiles (reckless, conservative, and casual) and examines how roundabout design influences these behaviors. Using data collected from drones, the research applies unsupervised machine learning, specifically K-means clustering, to classify driver behavior and assess roundabout design effectiveness. This research contributes to the understanding of driver behavior at roundabouts and offers insights for urban traffic planning and safety improvement. By identifying specific design elements that influence driving styles, this research provides valuable insights for urban planners and traffic safety experts aiming to design roundabouts that promote safe and efficient driving behaviors. The use of machine learning techniques, particularly K-means clustering, proves effective in dissecting complex driver behavior patterns.

An approach to traffic safety (Mouhammed et al., 2022) explores the classification of driving behavior at signalized intersections under different signal conditions using vehicle

kinematics data. The study employs the K-means clustering algorithm to categorize driving behaviors and investigates the impact of signal conditions on driver behavior. The research findings indicate that driving behavior is more influenced by individual habits and personality than by signal conditions, although the flashing green signal condition tends to induce more conservative driving behavior. This has important implications for the design of traffic signals and the development of safety measures, highlighting the need for traffic management strategies that consider the diversity of driver behaviors. By demonstrating the predominant influence of individual characteristics over external signal conditions, the study suggests avenues for further research in traffic safety and signal design, aiming to create safer road environments.

The driver behavior is also investigated in working zones (Huthaifa et al., 2022) using unsupervised machine learning. The study employs the K-means algorithm to classify drivers into aggressive, conservative, and normal categories based on vehicle kinematic data. The data was collected from 67 participants using a driving simulator, simulating various work zone scenarios to accurately capture driver responses. The findings reveal a higher number of aggressive and conservative drivers compared to normal drivers, suggesting that drivers either cautiously navigate through work zones or display aggressive behavior. The study provides insights for policymakers to enhance road safety in work zones. By identifying specific behavior patterns prevalent in such environments, the research contributes to the broader effort of enhancing safety measures and informing the development of more effective traffic management strategies in work zones.

The category of Machine Learning in Transportation and Logistics includes studies that apply machine learning techniques to challenges in transportation and logistics. Topics cover predictive maintenance in facility management, fuel consumption prediction for trucks, and real-time supply chain risk mitigation. These studies emphasize the role of AI and machine learning in improving efficiency and sustainability in these sectors.

One of the analyzed papers (Sheunesu et al., 2023) focuses on developing models for predicting truck fuel consumption. The study uses logistic regression and neural networks, comparing their effectiveness in forecasting fuel usage based on various driving parameters. This research addresses the challenge of managing fuel costs in the logistics industry, particularly in the context of rising oil prices and economic recovery post-Covid-19. The findings demonstrate the viability of these methods for efficient fuel management, contributing to cost reduction and environmental sustainability in transportation.

There are researchers (Nawal et al., 2023) who discuss the integration of machine learning in predictive maintenance within the Industry 4.0 paradigm. It reviews the evolution of maintenance strategies, emphasizing the transition from reactive to predictive maintenance using machine learning. The paper identifies the challenges in implementing machine learning-based predictive maintenance, particularly in small and medium enterprises, and provides a comprehensive overview of this approach. It highlights the importance of data quality, algorithm

selection, and the necessity of a preliminary phase in predictive maintenance projects. The paper aims to guide researchers and practitioners in successfully implementing machine learning in predictive maintenance, contributing to the advancement of smart manufacturing.

The last category of papers, included in the Innovative Technologies for Traffic and Vehicle Management class, explores the use of technologies like animation-based variable message signs and driver monitoring systems to improve traffic management and vehicle safety. These studies investigate the impact of such technologies on driver behavior and road safety, particularly in work zones and public transportation.

There is a paper (Mustafa et al., 2020) that investigates the effectiveness of innovative variable message signs (VMS) in enhancing road safety in work zones. It compares traditional static signs with graphical and animation-based VMS in a driving simulator study. The research aims to determine if these VMS systems can reduce drivers' traveling speeds, encourage early lane-changing, and improve spacing between vehicles. The study's findings suggest that animation-based VMS can effectively influence driver behavior, contributing to safer road conditions in work zones.

A drowsiness detection system (Ziryawulawo et al., 2023) is developed for the Kayoola EVS bus. It employs machine learning techniques using facial recognition algorithms to monitor driver alertness and triggers an alarm in cases of detected drowsiness. The study highlights the effectiveness of the developed system in real-time operation and its potential impact in reducing road accidents caused by driver fatigue. This research contributes to the field of advanced driver assistance systems and transportation safety.

A study was conducted (Delussu et al., 2021) focusing on minimizing fuel consumption in public buses using sensor data and Bayesian networks. The research methodology centers around the collection and analysis of data from various sensors installed on public buses. These sensors monitor numerous aspects of bus operation, such as acceleration and braking patterns, as well as fuel usage. The study employs Bayesian networks to analyze the complex relationships between these variables, aiming to identify patterns and factors that significantly impact fuel consumption. The results suggest potential strategies for fuel efficiency improvements, contributing to environmental sustainability and cost reduction in public transportation. This study not only advances the field of transportation research but also offers practical solutions for reducing the environmental impact of public buses, aligning with broader goals of sustainable urban development.

Each category represents a significant contribution to the fields of transportation engineering, logistics, and road safety, showcasing the diverse applications of machine learning and advanced analytics in these areas.

Data and Methodology

The study takes a comprehensive approach, not solely focusing on CO₂ emissions estimation but also on discerning drivers' behavioral patterns and identifying less sustainable routes in terms of emissions and terms of the impact of external events of varying intensities on car level. Additionally, it encompasses forecasting future emissions and fuel consumption, while pinpointing emission parameters that can be minimized, specifically targeting the reduction of supplementary CO₂ emissions in the analysis.

The dataset for this research was sourced from IoT sensors fitted on a select sample of nine diverse vehicles within a company's fleet, encompassing three vans and trucks used for freight transport, three service vehicles operated by company staff, and three rental cars leased out to individuals or other businesses. These sensors were installed in April, with data collection starting with May 2023 and channelled into a data lake. From this repository, data were extracted via APIs, initially aggregated, and subsequently utilized in various stages of the analysis. Spanning from May 2023 to September 2023, the data accumulated to a considerable volume of approximately 50 GB, providing a substantial foundation for a comprehensive five-month analytical period.

I will explore the four methodological directions used to gain a clearer understanding of their interconnections, with the ultimate goal of identifying points where company management can alter variables and strategies. This will enable the company to benefit not only in terms of its image as a sustainable entity but also through reduced costs.

Supervised Machine Learning for CO₂ Estimation

Linear regression was employed due to its predictive capabilities for continuous data, allowing to model a functional relationship between independent variables (vehicle type, distance, and fuel type) and the dependent variable (CO₂ emissions).

The linear regression model was developed using Python and the Scikit-learn library, streamlining the process of estimating CO₂ emissions for a vast dataset. While initial emission calculations for specific routes were performed using the myclimate calculator, the extensive volume of data points, spanning five months, necessitated a more efficient computational approach. Consequently, the linear regression model provided a systematic method to estimate emissions for the entire dataset, thereby optimizing the analysis process in our comprehensive study.

The dataset included distinct categories of vehicles and varied distances traveled, using different types of fuel. Emissions calculations were done using the [myclimate](https://www.myclimate.org/en/) (<https://www.myclimate.org/en/>) calculator, which is recognized for its accuracy and reliability in environmental impact assessment.

The model proved to be a robust predictor of CO₂ emissions, considering it had a coefficient of determination, denoted as R², higher than 85%. The coefficient is a statistical

measure in regression analysis that represents the proportion of variance for the dependent variable that's explained by the independent variables in the model. It provides a sense of the goodness of fit of the model to the data. An R^2 value of 1 indicates that the regression predictions perfectly fit the data, while an R^2 of 0 indicates that the model does not explain any of the variability in the outcome data around its mean.

Unsupervised Machine Learning for Vehicle Segmentation

Clustering was selected as the analytical method to segment the dataset based on driver behavior, external events of different intensities at the car level, or route characteristics without using predefined labels. This technique allowed for the exploration of the underlying structures in the data, revealing distinct groupings among drivers' behaviors, the diversity in their driving styles, and the various route patterns. These clusters help to identify behavioral trends and route patterns, which are important in developing personalized driver indicators for reducing the maintenance costs of the car and optimizing route planning.

In the study, Hierarchical Clustering was utilized for a detailed and layered analysis. The clustering model was built using Python and the Scikit-learn (sklearn) library. This approach facilitated the segmentation of routes and the categorization of drivers based on their driving styles, as well as the routes they frequently used and various external events impacting the vehicles. This method proved instrumental in delineating distinct patterns in driving behavior and route selection, offering nuanced insights into the diverse driving dynamics and external influences encountered.

The elbow method helped to determine the optimal number of clusters by finding the point where the rate of decrease in within-cluster variation sharply changes. Subsequently, the Silhouette score, ranging from -1 to +1, was calculated for each sample, offering a measure of how similar that object is to its cluster and compared to other clusters. The formula for the Silhouette coefficient in a dataset is represented as:

$$\frac{b-a}{\max(a,b)} \quad (1)$$

Where:

b = the mean distance between a sample and all other points in the next nearest cluster

a = the mean intra-cluster distance, or the average distance of a sample to all points in its cluster.

This coefficient's final value is the mean of all individual sample coefficients. A value close to 1 indicates clear segmentation, while a value near 0 suggests overlapping clusters and less effective segmentation.

Descriptive Cluster-Level Analysis

This analysis sought to uncover common patterns and noteworthy differences between the formed clusters, providing a granular understanding of the segmented groups.

ANOVA (Analysis of Variance) was employed to rigorously assess the statistical significance of mean differences across the identified clusters. This method allowed us to ascertain whether the observed variations in cluster characteristics were statistically substantial. For visual representation, we utilized box plots. These plots provided a concise and informative overview of the data distribution within each cluster, highlighting the range, central tendency, and any potential outliers, thereby offering a clear understanding of the data's spread and variability. This dual approach of ANOVA and box plots enriched our analysis, ensuring both statistical rigor and visual clarity in our findings.

LSTM for Future Emission Forecasting

A bidirectional LSTM (Long Short-Term Memory) network was implemented, which is capable of learning long-term dependencies and recognizing patterns across time-series data. This advanced neural network architecture is designed to capture both forward and backward dependencies in the data, enabling a comprehensive understanding of temporal patterns and trends. It is very good at recognizing complex, long-term relationships within time-sequenced data, making it an ideal choice for accurately forecasting future emissions and consumption trends, based on the historical data patterns it learns.

The LSTM's architecture was optimized for the specific data characteristics, including adjusting the number of layers to balance the model's complexity and computational efficiency, and the batch size to improve learning stability. Additionally, the learning rate was adjusted to promote convergent behavior, ensuring that the model consistently moved toward optimal performance during training.

These methods combined provide a robust framework for both analyzing current vehicle emissions and forecasting future trends, which is critical for developing effective environmental policies and strategies.

The Model and Findings

The data flow for this case study can be described as follows: Data is collected from IoT sensors installed on a fleet of vehicles, encompassing a variety of types including Vans, job cars, and rentals. This data is then transmitted and consolidated into a centralized data lake beginning May 1st. This data is extracted via APIs for subsequent analysis stages, providing a robust dataset spanning five months and aggregating to 50 GB in volume for comprehensive insights. Once data is extracted from the data lake via APIs, it is loaded into a MySQL database where further aggregation takes place to create data marts. These data marts serve as the

training ground for the machine learning models. The outcomes of these models are then fed back into the MySQL database. This integration allows for extensive data analysis, where the interplay between model results and raw data can be examined in-depth to derive actionable insights. The described flow is represented into the next figure (Figure 1):

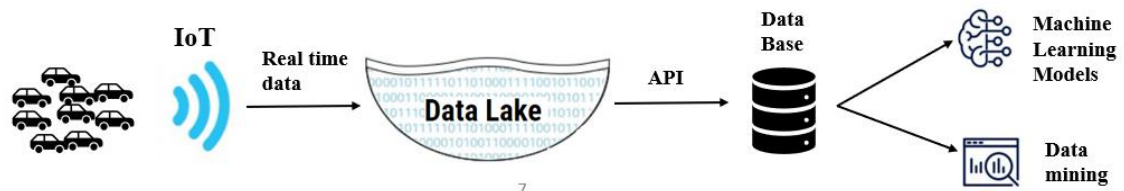


Figure 1. Flow of data

Source: authors designed

For the CO₂ emissions estimation component of the study, conducted from May 1, 2023, to September 30, 2023, a specific approach was undertaken. Initially, a manual calculation was performed using the myclimate calculator for a subset of the data to establish a baseline for emissions based on specific vehicle parameters such as route distance, fuel type (diesel/E10), and vehicle category (SUV, van, truck, luxury, mid-range car). This manual approach provided a detailed sample set of calculated emissions.

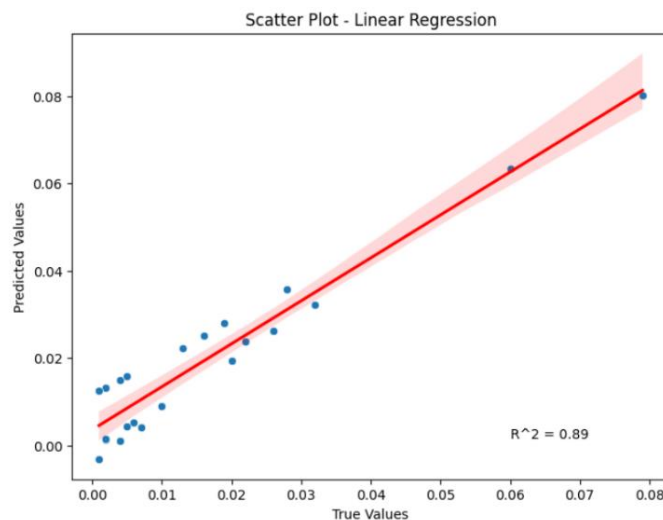


Figure 2. Plot for the linear regression model

Source: authors calculations, based on carburant consumption

Given the large volume of data points within the database, to enhance efficiency and scale the process, a linear regression model was developed and applied to the broader dataset. The regression model's scatter plot, with its distinct red regression line (Figure 2), produced using Python, and Matplotlib library, indicated that 89% of the variance in the dependent

variable (CO₂ emissions) could be explained by the independent variables incorporated into the model. The pink confidence interval on the plot provided a predictive range with a certain level of probability for the real values. This strategic combination of manual calculations for a targeted sample and automated regression for the extensive dataset ensured efficient analysis of vehicle emissions.

In the segmentation phase of the study, a range of variables were utilized to categorize vehicles and drivers according to their CO₂ emissions. The following variables were considered monthly: distance traveled, total CO₂ emitted, additional CO₂ emitted, unique locations visited, total locations visited, and duration of travel.

In the context of our data, the "additional CO₂ quantity" refers to emissions that fall outside the typical driving activity, specifically identified as the emissions resulting from prolonged idling. Our observations indicated that certain drivers were idling their engines for periods extending beyond five minutes. Such behavior, which is not associated with regular driving or traffic conditions, was categorized as supplementary fuel consumption and, consequently, additional CO₂ emissions. This categorization is critical as it helps isolate and quantify inefficient fuel usage that contributes to unnecessary CO₂ emissions, offering a clearer target for reducing the environmental impact of the fleet's operation. This aspect of the analysis underscores the importance of behavioral interventions that could lead to a reduction in idle times and, thereby, enhance overall fuel efficiency and sustainability.

Through this segmentation, two distinct clusters emerged, differentiated by their emission patterns and travel behaviors. The silhouette score, peaking at 0.35 for the two clusters, suggests a moderate separation between them. This is further substantiated by a significant F-statistic and a p-value of 0.0075, indicating that the variability in the number of unique locations visited is significantly greater between the clusters than within them. This statistical outcome implies that the drivers in one cluster are visiting more unique locations, which could be contributing to their higher CO₂ emission levels.

Moreover, the greater F-statistic value reinforces the distinction between these two clusters, suggesting substantial differences in their travel and emission profiles. This could be reflective of varying driving habits, operational purposes of the vehicles, or other underlying factors such as the frequency of trips to certain locations that are farther away or require more fuel-intensive travel routes. The segmentation thus provides a detailed characterization of the fleet, informing targeted interventions for emission reduction and more efficient fleet management.

Following the segmentation into clusters, an exploratory analysis was to visually discern and confirm the differences between them. For each variable, including the monthly unique locations visited, boxplots were generated for each cluster. These boxplots serve as a powerful visualization tool, laying out the distribution spread and central tendencies, and highlighting any potential outliers. By comparing these boxplots across clusters, we could visually validate the significant differences that the statistical tests indicated. The boxplot for

the variable 'unique locations visited' (Figure 3) particularly illustrated a clear disparity between the clusters, reinforcing the findings from our statistical analysis that drivers in different clusters exhibited distinct patterns in their travel behaviors. This visual representation complements our statistical findings, providing an intuitive understanding of the data's structure and the behavioral segmentation within the fleet.

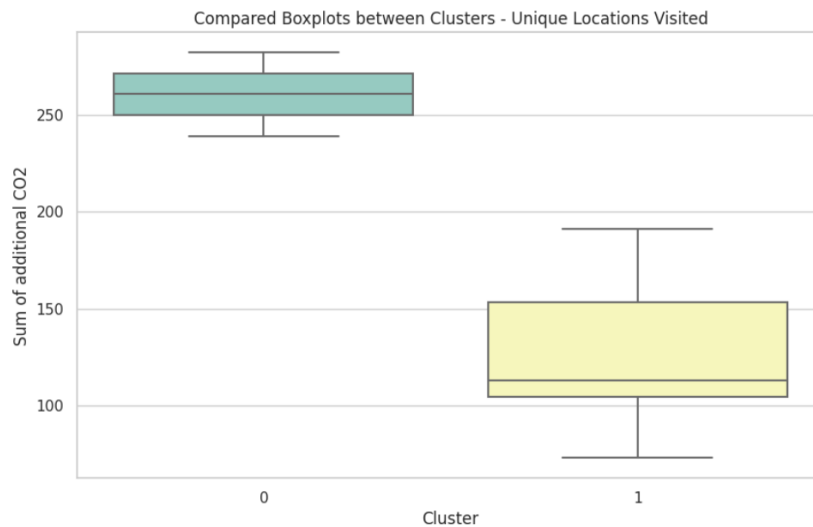


Figure 3. Boxplot for variable 'Unique locations Visited' for the two distinct clusters

Source: authors calculations

The objective of the CO₂ emissions forecasting segment of the study was to predict the future CO₂ consumption of the fleet weekly. To achieve this, we employed a Bidirectional Long Short-Term Memory (LSTM) network at the individual vehicle level. This advanced form of a recurrent neural network (RNN) is uniquely suited for this task due to its ability to process sequences of data while considering both past and future context, which is crucial for making accurate predictions.

Bidirectional LSTMs extend the capabilities of standard LSTMs by analyzing the data in both forward and backward directions, thereby capturing patterns that may be overlooked when considering only past context. This dual-direction analysis is particularly beneficial when dealing with complex time-dependent data like CO₂ emissions, which can be influenced by a myriad of interdependent factors.

Despite the sophisticated nature of the model, the results obtained were suboptimal, with an R² score of less than 0.2. This suggests that the model was unable to capture the complexity of the emissions patterns within the fleet adequately. A potential reason for the model's underperformance could be the size of the dataset. With smaller datasets, the model has limited data from which to learn, reducing its ability to generalize and identify complex patterns. This limitation was further investigated by conducting a Dickey-Fuller test for each

time series to check for stationarity. The results confirmed that the time series for the vehicle in question was stationary, suggesting that the issue lies not in the nature of the data but possibly in the amount available for the model to learn from.

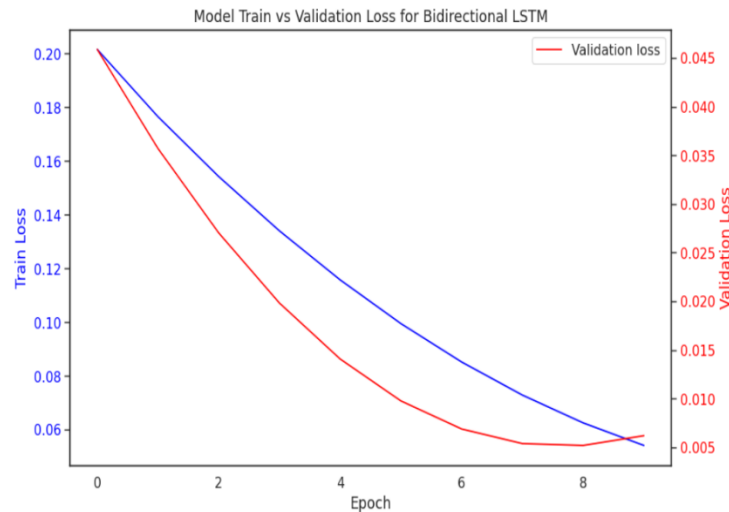


Figure 4. Loss comparison between training and validation set

Source: authors calculations

The observed pattern in the loss graph (Figure 4), where both training and validation loss decrease initially, with validation loss reducing at a faster rate before beginning to rise in the later epochs and eventually intersecting with the training loss, suggests a phenomenon known as overfitting.

At the start, as the model learns from the training data, it is expected that the loss metrics for both the training and validation sets decrease. This indicates that the model is improving its predictive accuracy. However, as training progresses, the model may start to learn not only the underlying patterns in the data but also the noise and random fluctuations specific to the training set.

When the validation loss starts to increase while the training loss continues to decrease, it implies that the model's adjustments are too specific to the training data, and its generalizability is suffering. This is where the model has essentially memorized the training data rather than learning to generalize from it. As a result, its performance on the validation set—representing new, unseen data—begins to worsen.

The intersection of the training and validation loss curves towards the later epochs further confirms that the model's performance on the training set is no longer a reliable indicator of its performance on unseen data. This calls for early stopping, regularization techniques, or adjustments to the model's complexity to prevent overfitting and to ensure that the model remains robust and performs well on both the training and validation sets.

Figure 5 is presenting the history of CO₂ emissions for all 9 cars analyzed and the estimation for the future three weeks. The estimation is an aggregate result off all the LSTM forecasts at the car level.

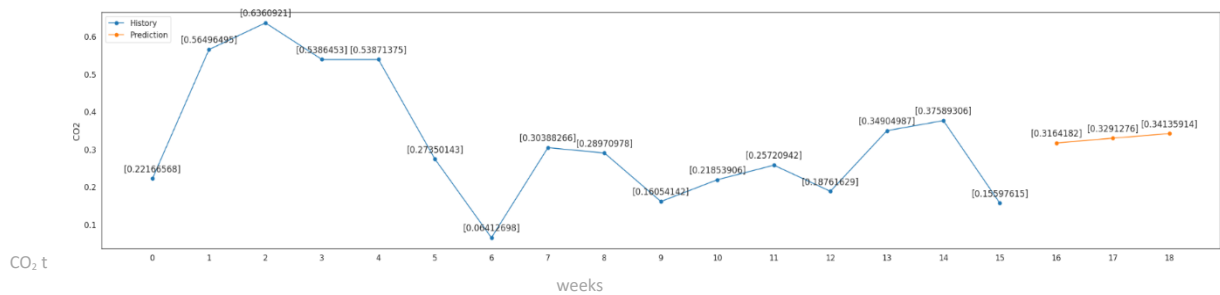


Figure 5. Time series for CO₂ History at the entire fleet analyzed plus future estimation for the next 3 weeks

Source: authors calculations, based on carburant consumption

The segmentation analysis at the route level involved a detailed examination of CO₂ emissions. These variables included the quantity of CO₂ emitted per route and per vehicle, the additional quantity of CO₂ emitted in the same context, the number of vehicles utilizing each route, and the frequency of route usage on a weekly basis.

With a high silhouette score of 0.72 for three clusters, the segmentation process suggested a robust distinction between the different groups. This was further corroborated by ANOVA results, where a p-value significantly less than 0.05 indicated substantial differences among the clusters.

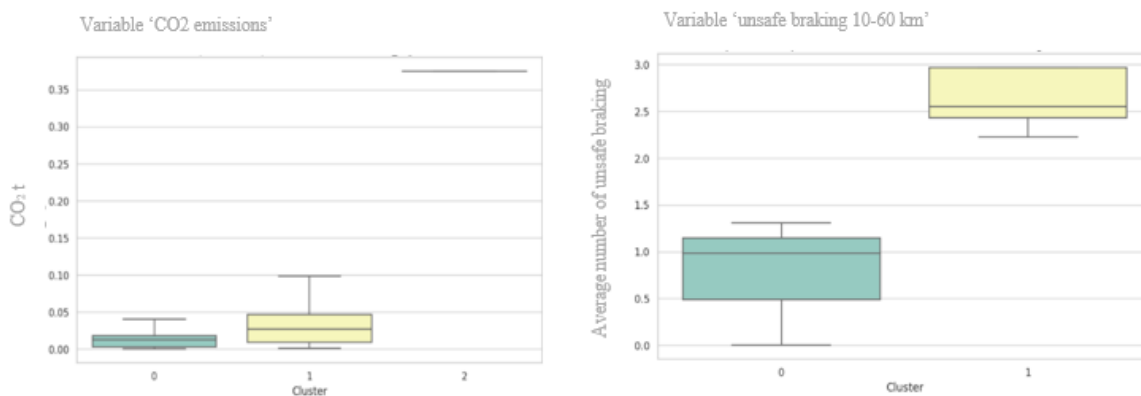


Figure 6. Boxplots for the distinct clusters

Source: authors calculations

To visually confirm and explore these differences, boxplot analyses were conducted for each cluster. These boxplots (Figure 6) were instrumental in highlighting the variations in CO₂

emissions among the clusters. For example, the analysis of CO₂ emissions across clusters using boxplots revealed significant disparities, indicating that some routes or vehicles were associated with higher emissions.

In the segmentation analysis focused on driver behavior, a comprehensive set of variables (Table 1) was employed to categorize drivers based on their driving safety metrics. The variables used for segmentation included the average, sum, and count of unsafe braking events at different speed intervals (10-60 km/h, 60-110 km/h, and over 110 km/h), as well as the average, sum, and count of corners taken dangerously within the same speed brackets. Additionally, metrics for unsmooth trips, which include sudden movements or jolts within medium and high-speed ranges, were also considered.

Table 1. Some variables used for driver behavior segmentation (number/car)

Car ID	AVG Unsafe braking 60 - 110 km/h	AVG Unsafe braking > 110 km/h	AVG Corner taken dangerously 60 - 110 km/h	AVG Unsmooth trip > 110 km
0001	0.14	0.00	0.13	0.07
0002	0.16	0.00	0.08	0.21
0003	1.46	0.26	1.42	1.62
0004	0.97	1.77	0.70	1.48
0005	0.00	0.00	0.00	0.00
0006	0.56	0.26	0.88	1.59
0007	1.39	0.45	0.43	2.33
0008	0.53	0.30	0.25	1.34

Source: authors calculations, based on IoT data

With a silhouette score of 0.36 for two clusters, the analysis effectively divided the drivers into groups with distinct driving behaviors. Particularly, it highlighted a segment of drivers who demonstrated unsafe driving practices that could negatively impact vehicle maintenance. Notably, all rented and service vehicles fell into this category, suggesting a trend that these vehicles tend to be driven less carefully.

Boxplots were also used to illustrate the differences between clusters (Figure 6), offering a visual representation of the data distribution for each variable. For example, the variable 'average unsafe braking between 10 and 60 km/h' was depicted in a boxplot, revealing significant variations between the two clusters. This visualization underscores the clusters' behavioral differences, with one showing a higher propensity for unsafe braking, thus requiring targeted interventions to improve safety and reduce potential maintenance issues.

Conclusions

The study's conclusions are diverse, spanning various models and analyses. They encapsulate the nuanced outcomes of different machine learning applications in the study, ranging from the descriptive analysis of driver behavior clusters to the intricate details of CO₂ emission segmentation. The findings also delve into the specific challenges and limitations encountered, such as the limited performance of certain predictive models on smaller datasets. Overall, these conclusions offer a multifaceted view of the study's impact and its contributions to understanding vehicle and driver behavior dynamics.

The cluster-level descriptive analysis, utilizing boxplots and ANOVA, played a crucial role in our study. It enabled to discern of significant behavioral differences among various driver groups and conducted to the conclusion that the clusterisation algorithms and the chosen number of distinct clusters was significant. By analyzing these clusters, we identified distinct driving behaviors and their corresponding carbon emission variabilities. This analysis not only highlighted the diversity in driving patterns but also provided valuable insights into the environmental impact of these behaviors, emphasizing the importance of tailored strategies for emissions reduction and efficient driver management.

The study's use of machine learning algorithms to address unwarranted fuel consumption was particularly revealing. It identified a specific segment of drivers who habitually leave their engines running when idle, contributing significantly to fuel siphoning. This discovery highlights the urgent need for comprehensive strategies aimed at curtailing such harmful practices. Effective measures are required not only to prevent fuel wastage and misappropriation but also to promote more environmentally responsible behavior among drivers, thereby enhancing overall sustainability in vehicle usage.

The study's CO₂ emissions segmentation through algorithms revealed a pivotal aspect: a particular vehicle cluster demonstrated significantly higher CO₂ emissions, despite comparable mileage to other groups. This cluster, characterized by more unique location visits, stood out for its disproportionately high additional CO₂ emissions. This finding underscores the complexity of emission patterns, highlighting that factors beyond mileage, like location frequency, play a critical role in environmental impact. It brings to light the need for more nuanced approaches to addressing vehicle emissions.

The bidirectional LSTM model used in our study, while demonstrating high effectiveness in analyzing larger datasets, encountered limitations when applied to smaller datasets. Its performance, as indicated by an R² value not exceeding 20% at the individual vehicle level, suggests that its predictive accuracy diminishes with the reduction in data size. This outcome highlights the need for model adjustments or alternative approaches when dealing with less voluminous data, ensuring that the predictive quality is maintained across different dataset sizes.

The route segmentation aspect of our study unveiled a significant pattern: certain routes were consistently used more frequently and were associated with markedly higher CO₂ consumption. This pattern points to unnecessary fuel wastage or inefficient fuel use along these routes, raising important questions about the causes of such excessive consumption and the potential need for targeted interventions to optimize fuel efficiency. This insight not only highlights specific areas requiring immediate attention but also underscores the need for more targeted measures to address and mitigate such irregularities in CO₂ emissions.

The study's driver segmentation revealed a distinct group characterized by potentially aggressive driving behaviors. This particular cluster, predominantly comprising individuals using rented or company vehicles, showed tendencies that could lead to adverse effects on vehicle maintenance. This finding is crucial for understanding the implications of driving behaviors on vehicle wear and tear, highlighting the need for targeted interventions or education programs, especially for drivers of rental and company-owned vehicles.

The research faced several limitations which could impact the breadth and depth of its conclusions. The small sample size due to IoT devices installed in a limited number of vehicles may affect the generalizability of the results across the entire fleet. Relying on an external CO₂ calculator and the absence of IoT measurements for pollutants like NO_x may introduce discrepancies in pollution emission assessments. Additionally, the lack of driver identification data, such as gender and age, restricts the analysis of how these factors may influence driving behavior and emissions.

For future developments, this study envisages a holistic expansion across the entire fleet by incorporating IoT devices into all vehicles, thereby enhancing data representativeness and result generalization. Direct measurements of pollutants through specialized IoT sensors will offer accurate pollution emission data. The integration of maintenance records will augment telematic predictors with technical vehicle health data. Additionally, introducing sensors to monitor driver behavior, like driving style and habits, will yield further insights to elevate efficiency and reduce emissions.

As a proposed further development of this study, incorporating a meteorological dimension could significantly enhance the analysis. Recognizing a potential correlation between weather conditions and the incidence of external impacts on vehicles, this extension would involve overlaying weather data with the timing and characteristics of recorded impacts. The aim would be to uncover patterns that might indicate weather-related vulnerabilities, thus providing a more complete understanding of the factors influencing driving behavior and vehicle safety.

This proposed inclusion of meteorological data aspires to lead to more informed decisions regarding fleet management, driver training programs, and vehicle maintenance schedules. This exploration of the interplay between weather conditions and driving incidents

could offer valuable insights, potentially guiding strategic adjustments in fleet operations to mitigate risks associated with adverse weather.

Acknowledgments

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POLICY OF FOREIGN ECONOMIC COOPERATION OF THE GOVERNMENT OF THE REPUBLIC OF KOREA WITH ASEAN

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Kyung Sook GIL*²

Abstract. *The Republic of Korea has achieved economic growth and development thanks to the benefits of trade liberalization within the framework of a multilateral trading system. However, it faced a new international trading environment with the emergence of neoprotectionism. Initially, neoprotectionism was promoted by developed countries, but now it is becoming a common phenomenon in the international trading environment. In particular, the political and economic conflicts between the United States and China are forcing a radical change in the foreign trade policy of the Republic of Korea. The prolonged confrontation between the two largest markets for the South Korean economy has reinforced the need to review the foreign economic policy of the Government of the Republic of Korea. In response to changes in the international trading environment, the Government of the Republic of Korea was forced to develop and promote new directions of foreign economic policy for the development of the multilateral trading system.*

Keywords: *mutually beneficial economic cooperation, foreign economic policy, neoprotectionism, deglobalization, global value chain.*

UDC : 339.54(519.5)

JEL Code: E60, F02, F13.

Introduction

The Policy of Foreign Economic Cooperation of the Government of the Republic of Korea with ASEAN was adopted in November 2017, and its main goal is to strengthen economic cooperation to the level of the four largest powers located around the Korean peninsula – the United States, Japan, China and Russia. ASEAN is becoming a motor of the global economy, replacing China in the manufacturing industry. That is, the role of ASEAN is increasing in global economic development.

The **subject of research** is the development of cooperation between the Republic of Korea and ASEAN in order to provide a production base and expand export markets through direct investment and the transfer of production facilities.

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The **main goal of the research** is to assess the new foreign economic policy of the South Korean Government not only in expanding the volume of commodity turnover, but also in improving the quality of foreign economic relations with ASEAN partner countries on the basis of mutually beneficial economic cooperation.

Review of Literature

The Government of the Republic of Korea strives to find a new way for the long-term development of the South Korean economy, which has experienced a trend of low growth, by expanding mutually beneficial economic cooperation with ASEAN. ASEAN is becoming a motor of the world economy, replacing China in the manufacturing sector. Therefore, the Government of the Republic of Korea is developing cooperation with ASEAN in order to provide a production base and expand export markets through direct investment and the transfer of production facilities. The main objective of the new foreign economic policy of the South Korean Government is not only to expand the volume of commodity turnover, but also to improve the quality of economic relations with ASEAN partner countries on the basis of mutually beneficial economic cooperation.

As a measure of the long-term development of the South Korean economy, scientists are actively conducting research on the mutually beneficial policy of foreign economic cooperation with ASEAN. To study the foreign economic cooperation of the Republic of Korea and ASEAN, the scientific works of the following scientists were used. Park Byeongsu (2022) evaluates the economic cooperation policy of the Government of the Republic of Korea in relation to ASEAN and the directions for its improvement. Kwak Seonggil (2018) pays special attention to promoting the strategy of South Korean SMEs to enter the ASEAN market, as well as promoting the practical policy of foreign economic cooperation with ASEAN.

In particular, the importance of Official Development Assistance (ODA) projects in implementing the policy of foreign economic cooperation with ASEAN is increasing. Park Seolhee (2022) and Lee Sangsoon (2021) demonstrated a research paper on the development of strategic ODA programs and improving the system for ASEAN. Direct investments of the Republic of Korea are important for expanding practical economic cooperation with ASEAN. Lee Daehwa and Moon Jihyeon analyzed the current status of direct investments of the Government of the Republic of Korea in ASEAN and explored practical strategies for the future. The state of trade and investment with ASEAN was provided by the National Statistical Office of the Republic of Korea.

According to the general opinion of South Korean economic experts, it is proposed to actively pursue a policy of expanding foreign economic cooperation with ASEAN in order to diversify the trade structure of the Republic of Korea and achieve long-term economic development. In addition, South Korean economists emphasized the importance of mutually beneficial economic cooperation through ODA projects while pursuing a policy of expanding foreign economic cooperation with ASEAN. Above all, with the promotion of economic cooperation with ASEAN, the importance of sharing and transferring the experience of economic development of the Republic of Korea is emphasized.

Methodology

The prerequisites of the policy of foreign economic cooperation of the Government of the Republic of Korea with ASEAN can be summarized in three points:

Firstly, there is an increasing need to diversify the foreign economic policy of the Republic of Korea. The structure of the Republic of Korea's foreign trade is strongly oriented towards export-import structures and the main economic blocks (Figure 1). As shown in the graph in Figure 2, the economic structure of the Republic of Korea is completely dependent on foreign trade.

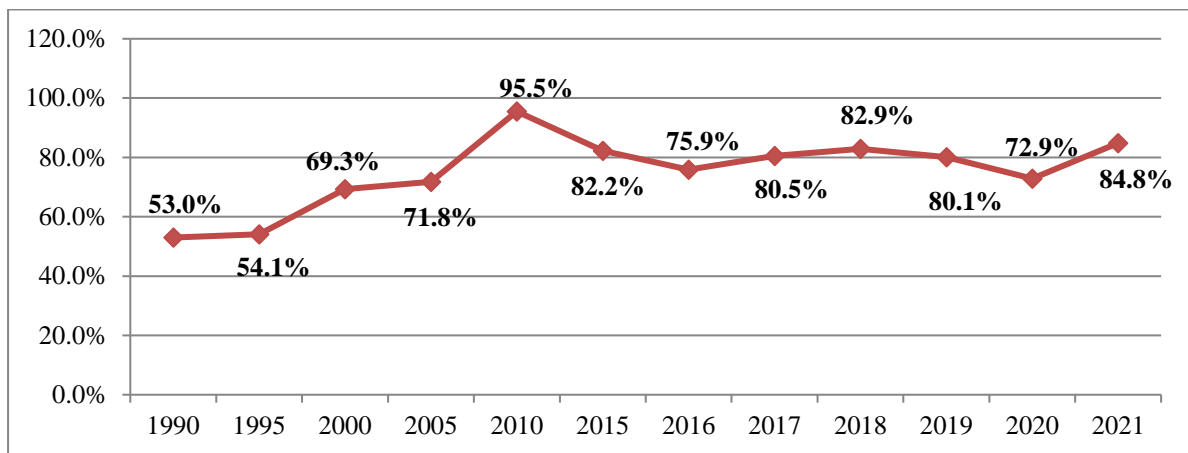


Figure 1. Ratio of imports and exports to the GDP of the Republic of Korea (%)

Source: Korea's major economic indicators (2023)

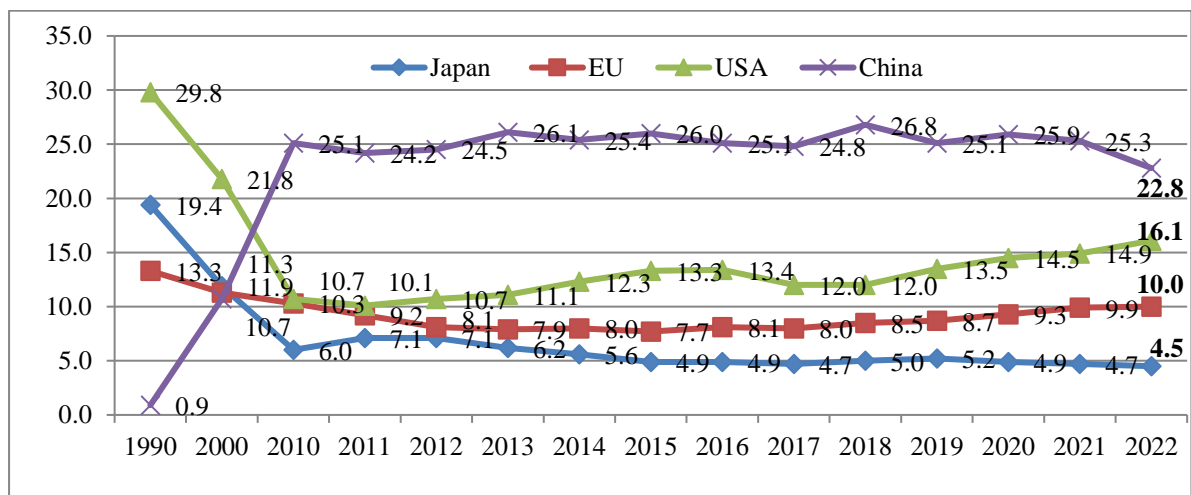


Figure 2. Share of exports by the main partner countries of the Republic of Korea

Source: Korea's major economic indicators (2023)

This fact shows that the economic structure of the Republic of Korea is very sensitive to changes in the international trading environment. In addition, the main export items of the Republic of Korea are heavily dependent on certain goods, such as semiconductors, automobiles,

petrochemicals, electronics and shipbuilding, which act as destabilizing factors for the development of the South Korean economy. In particular, the South Korean economy is very sensitive to the price and demand for semiconductors, which account for the largest part of export items. In addition, the foreign trade of the Republic of Korea is highly concentrated by regions, including China, the USA, Japan and EU countries. As shown in Figure 2, the four main economic blocks account for more than 50% of the foreign trade of the Republic of Korea.

In particular, the diversification of the foreign economic policy of the Republic of Korea has become inevitable due to the protracted trade conflict between the United States and China. The structure of the South Korean economy is vulnerable not only to economic retaliation from China and Japan, but also to shocks from US trade pressure. For this reason, the policy of foreign economic cooperation with ASEAN was introduced as an alternative to overcome the biased foreign economic structure of the Republic of Korea.

Based on this foreign economic situation, the Government of the Republic of Korea is actively seeking to diversify risks in accordance with the trend of the global economy, where uncertainty is increasing, by expanding foreign economic cooperation with ASEAN.

Secondly, due to the increase in the international status of ASEAN, cooperation is strengthening not only in the field of economic development, but also in society as a whole. ASEAN has maintained high rates of economic growth since the 2000s, it stands for an open economy, and its influence in the global economy is gradually increasing. In particular, the ASEAN market is the second largest trading partner of the Republic of Korea and a place for investment, and is also turning into an economic bloc that can complement and replace China. For the Republic of Korea, the status of ASEAN is the same as that of the four major powers, which are closely linked to the peace and security of the Korean peninsula. It means the international status of ASEAN has increased not only economically, but also culturally, politically, diplomatically and even militarily. For this reason, the need for the South Korean Government to review its policy of foreign economic cooperation with ASEAN has increased.

Thirdly, the main political goal of the foreign economic cooperation between the Government of the Republic of Korea and the ASEAN countries is mutually beneficial economic development. The policy of foreign economic cooperation of the Government of the Republic of Korea with ASEAN has the characteristics of regional cooperation for mutually beneficial cooperation and integration in Asia. On the one hand, China is strengthening the creation of an economic bloc through the “One Belt, One Road” initiative and its promotion. On the other hand, the United States is strengthening its military influence by promoting a “Free and Open Indo-Pacific Strategy”. For this reason, the regional structure of the Asia-Pacific region is strengthening its mutually exclusive character. Therefore, the Government of the Republic of Korea strives to mitigate mutually exclusive competition and achieve the formation of a structure of mutually beneficial cooperation in the Asia-Pacific region by promoting a policy of foreign economic cooperation with ASEAN.

In particular, the Government of the Republic of Korea carries out regional cooperation based on the principles of openness, transparency and mutually beneficial relationship within the framework of its policy of foreign economic cooperation with ASEAN. The main direction of economic cooperation with ASEAN is the exchange of experience in the industrialization of

the Republic of Korea and the promotion of individual mutually beneficial cooperation in the long term with regard to diversity of each country.

The specific plan of the Government of the Republic of Korea for mutually beneficial economic cooperation with ASEAN is to accelerate the development of the manufacturing industry in the ASEAN countries through the expansion of direct investment and the relocation of manufacturing facilities of Korean companies. The above-mentioned mutually beneficial foreign economic cooperation means the formation of a complementary production structure in which the advanced production capabilities and technologies of the Republic of Korea are combined with the raw materials and labor of ASEAN.

Through such foreign economic cooperation between the Republic of Korea and ASEAN, they strive to form a new global value chain and pursue common interests. Thus, the foreign economic cooperation between the Republic of Korea and the ASEAN countries is developing from a simple trade expansion to a complementary economic structure.

Strategy of the Government of the Republic of Korea to promote the ASEAN Economic Cooperation Policy

In August 2018, the Government of the Republic of Korea established the Special Committee for Economic Cooperation with the Southern Countries, and in November approved the “Strategy for the Development of Economic Cooperation with the Southern Countries”. **Four specific cooperation plans** were established as the “Strategy for the Development of Economic Cooperation with the Southern Countries” (Park Byeongsu, 2022).

a) The policy of foreign economic cooperation with ASEAN of the Republic of Korea is to strive for mutually beneficial and equal cooperation with partner countries. In order to ensure mutually beneficial and equal economic cooperation with ASEAN, the Government of the Republic of Korea is expanding market opening and promoting the import of raw materials from ASEAN, as well as increasing investment in production. In addition, the Government of the Republic of Korea promotes a policy of mutual cooperation for the development of the ASEAN industrial structure through digital economic cooperation based on the 4th Industrial Revolution.

Until now, the Republic of Korea’s economic relations with ASEAN have been focused on the sales market for export growth and a simple production base with low wages. In addition, the Republic of Korea’s direct investments in ASEAN were focused on temporary investments through the simple transfer of manufacturing facilities, rather than long-term investments in facilities based on advanced technologies. Such a biased strategy of the Republic of Korea to advance in ASEAN had many limitations in the development of mutually beneficial and sustainable economic cooperation with ASEAN.

However, the Government of the Republic of Korea has rebooted economic cooperation relations with ASEAN, promoting the “Strategy of Promoting Economic Cooperation of the Southern Countries”. For this reason, the Government of the Republic of Korea supports the strengthening of ASEAN manufacturing facilities, such as the exchange of industrial technologies and raw materials, parts and finished products for the development of manufacturing industry in ASEAN. Thus, the Republic of Korea and ASEAN are forming a mutually beneficial economic cooperation structure that strengthens the competitiveness of South Korean companies in ASEAN and at the same time expands the participation of local companies in the global value chain.

In particular, the Government of the Republic of Korea is creating TASK centers (Technology Advice and Solutions from Korea) in the main ASEAN countries to support the development of industrial technologies (Table 1). On the one hand, the Government of the Republic of Korea is strengthening the foundations of ASEAN industrialization through investment and technology transfer in key high-value-added industries such as automobiles, steel and petrochemicals, and on the other hand, it is being used as a way to circumvent protectionism by ASEAN countries.

Table 1. Key tasks and functions of a TASK center (Technology Advice and Solutions from Korea)

	Technology transfer at industrial sites in practice	Training of engineers	Strengthening the innovative capabilities of management technologies
Key tasks and functions of the center	<ul style="list-style-type: none"> - Technical recommendations for production sites to improve the quality and productivity of companies in developing countries; - Support for the creation of a GVC (global value chain) between two countries and the expansion of technology exchange. 	<ul style="list-style-type: none"> - Support of industrial technology training programs for university staff in developing countries; - Assistance in finding employment with South Korean companies entering the local market; - Implementation of field training by inviting industrial experts from developing countries to the Republic of Korea. 	<ul style="list-style-type: none"> - Management training to strengthen the potential of technological innovation for CEOs of companies in developing countries. - Exchange of experience in the economic development of the Republic of Korea by inviting experts from ministries of economy of developing countries.

Source: Park Byeongsu (2022, pp. 13)

In addition, the Government of the Republic of Korea should promote economic cooperation to increase the potential of industrialization, since Myanmar, Laos and Cambodia are at an early stage of economic development, where the manufacturing base is still underdeveloped. In other words, strengthening economic cooperation and supporting countries at a late stage of economic development will ultimately create the basis for Korean companies to enter the market in the future.

Specific cooperation measures include expanding the scope of cooperation through the creation of industrial cooperation complexes, the introduction of standards and certification systems, the creation of trade promotion organizations, as well as the creation of vocational education and training institutions. From the earliest stage of development, through close economic cooperation with partner countries, it is necessary to establish communication between governments and companies between the two countries. In particular, support from the Korean Government and companies is important for the agricultural, fishing and commodity sectors of partner countries at an early stage of economic development.

This is due to the fact that partner countries at an early stage of economic development need experience and knowledge in the field of preparing economic development policy. In addition, the policy of economic cooperation of the Korean Government with the ASEAN

countries is based not on the expansion of export markets and the relocation of manufacturing facilities using a low-wage structure, but on mutually beneficial economic development.

b) The economic cooperation of the Republic of Korea with ASEAN consists in expanding cooperation with the existing manufacturing industry to new areas, such as consumer goods and services, as well as new industries. The goal is to support the revitalization of Internet services and consumer content markets in countries with relatively advanced industrialization in the ASEAN region, such as Singapore, Thailand and Malaysia. In addition, it supports the entry of South Korean SMEs through e-commerce platforms in ASEAN countries. The Government of the Republic of Korea is gradually promoting cooperation in new growing service areas such as ICT, biomedicine and fintech to gradually expand from Singapore, Thailand and Malaysia to other developing ASEAN countries.

In addition, the direction of economic cooperation of the Government of the Republic of Korea is the transfer and joint use of advanced innovative systems of the Republic of Korea, such as “Smart-City”, “Smart-Factory”, “Smart-Islands” and “Smart-Farm”, which combine technologies, products and services to solve various unresolved problems in the ASEAN region, such as energy, agriculture and urbanization. Thanks to this, the Republic of Korea is developing new export models and products for the ASEAN countries and the ASEAN countries are creating a model of mutual cooperation that establishes a model of national development through the introduction of the advanced innovation system of the Republic of Korea.

c) The direction of economic cooperation of the Government of the Republic of Korea with ASEAN is not only to develop economic cooperation with ASEAN, but also to strengthen diplomatic and security cooperation. It is very important for the Republic of Korea to receive support from ASEAN in order to overcome the growing uncertainty in the global economic environment and strengthen economic cooperation in the Asian region. In addition, close cooperation on political security issues in ASEAN is expanding in order to establish lasting peace on the Korean peninsula. The establishment of a lasting peace regime on the Korean peninsula requires cooperation and support not only from the United States, Japan, Russia and China, but also from neighboring ASEAN countries. Substantial economic cooperation has a direct impact on national security. For this reason, it is necessary to expand close economic cooperation with ASEAN in order to establish peace on the Korean peninsula.

For this purpose, the South Korean Government has expanded foreign exchange financing and trade investments to strengthen economic cooperation with ASEAN and promoted cooperation in multilateral forums such as the WTO. In particular, recently the Government of the Republic of Korea has been expanding economic cooperation not only through the FTA with ASEAN, but also through the FTAs with individual Asian countries.

d) The policy of the Government of the Republic of Korea in the field of economic cooperation with ASEAN is to create infrastructure in the industrial and agricultural sector for sustainable economic development and cooperation with partner countries. The South Korean Government’s specific plan of cooperation with ASEAN is to strengthen cooperation to increase agricultural productivity and develop agricultural operations

³ This means building an intelligent society within the scope of various ICT-based platforms. In other words, the creation of services in various fields with real-time data mining and artificial intelligence through a global Internet system.

infrastructure centered in the region along the Mekong River with regard to the fact that ASEAN remains heavily dependent on the agricultural sector.

Some ASEAN countries, Laos and Myanmar, in particular, have relatively high levels of poverty. Therefore, one of the main goals of the national policy of these countries is the fight against poverty by increasing agricultural productivity. These countries strive to break out of poverty through the development of agriculture and rural areas transferring the experience of economic development of the Republic of Korea.

In addition, the Government of the Republic of Korea implements various economic development and cooperation programs in the ASEAN countries, including a policy of encouraging local SMEs. The Government of the Republic of Korea is creating vocational training schools for local SMEs and cooperating with professional training projects. In addition, it supports the promotion of digital economy policy by cooperating with ASEAN countries in the policy of promoting startups in the field of ICT.

In particular, the countries along the Mekong River (Myanmar, Laos, Thailand, Cambodia) are becoming new production bases that can replace China or Vietnam for South Korean companies in the medium and long term. The countries along the Mekong River, with the exception of Thailand, have high economic growth rates, exceeding an average of more than 6%, and a young population aged about 20 years, so in the future they will serve as production bases, economic and logistics centers connecting huge markets. Myanmar and Laos are also rich in the bowels of the planet, such as oil, natural gas and copper.

The main directions and tasks of foreign economic cooperation between the Republic of Korea and the ASEAN countries

In 2019 Korea Institute for International Trade assessed the business environment of five ASEAN countries (Vietnam, Indonesia, Philippines and Thailand) and China, classifying them by economic, political and social aspects. According to the assessment, the ASEAN business environment has improved to a level comparable to China. From the economic point of view, the business environment of Vietnam and Indonesia is close to the Chinese one. China received good reviews in terms of market attractiveness, but its efficiency was lower than that of the ASEAN countries due to high wages.

From the economic policy's point of view, conditions in most ASEAN countries are better than in China. Indonesia and Thailand have demonstrated an advantage over China in their governments' economic policies, while Malaysia, Vietnam and the Philippines have demonstrated an advantage in their investment and trading systems. From the social aspect, Thailand and Malaysia, which have strong infrastructural and entrepreneurial conditions, were evaluated on a par with China. Based on these results, ASEAN has sufficient conditions to become a suitable partner for the economic cooperation diversification strategy of the Republic of Korea. For this reason, the Government of the Republic of Korea held a special Korea-ASEAN summit in 2019 to present systematic definitions of the "Policy of Economic Cooperation with the ASEAN Countries" (Kwak Seonggil, 2018).

a) The main goals of the foreign economic cooperation policy of the Government of the Republic of Korea are implemented with priority in the areas of practical cooperation in accordance with the needs of the ASEAN countries. The existing policy of foreign economic cooperation of the South Korean Government in relation to ASEAN was primarily

aimed at expanding the export market. However, at the Korea-ASEAN Forum, the Government of the Republic of Korea established the following directions and tasks of foreign economic cooperation with ASEAN – strengthening cooperation through the exchange of experience and personnel, creating a basis for future-oriented economic cooperation, creating a peaceful and secure regional environment.

Table 2. The main content of the directions and tasks of economic cooperation of the Republic of Korea with ASEAN

	Promoting mutual understanding through the exchange of experience and personnel	Creating the basis for long-term economic cooperation based on mutually beneficial cooperation	Creating a peaceful and secure environment for regional security
Strategies of mutually beneficial economic cooperation of the Republic of Korea	<ul style="list-style-type: none"> - Expansion of attraction of tourists from the ASEAN region to Korea (simplification of the visa issuance system); - Expansion of bilateral cultural exchange with ASEAN countries; - Expanding the exchange of personal resources for students, teachers and government officials in the ASEAN region (Support for training in technical and vocational education); - Strengthening support for the capacity of public administration in the ASEAN countries through the support of the e-government system. - Improving the quality of life in ASEAN countries (improving the living standards of local residents by supporting rural development, health and sanitation) - Strengthening cooperation between the Republic of Korea and the Mekong River (establishment of the Mekong River Biodiversity Research Center) 	<ul style="list-style-type: none"> - Creating an institutional framework for promoting ASEAN trade and investment (promoting bilateral FTAs with major ASEAN countries); - Infrastructure development and expansion of support to promote the economic development of ASEAN countries (regional development and modernization of transport and communications through ODA support); - Support for the development of SMEs between the Republic of Korea and ASEAN and mutual exchange (strengthening technological exchange and cooperation between SMEs); - Cooperation in support of entrepreneurship for new industries and IT-start-ups (strengthening cooperation in the field of Research and Advanced Development in the information and communication sector); - Individual joint development and support for each ASEAN country (Agreement on the Prevention of Double Taxation of the Republic of Korea and Cambodia). 	<ul style="list-style-type: none"> - Intensification of exchanges between heads of states and high-ranking government officials of the ASEAN countries; - Strengthening economic cooperation for the denuclearization of the Korean peninsula and the establishment of a permanent peace regime. - Joint development and cooperation for national defense and defense industry; - Improving emergency prevention capacity and strengthening rapid response and recovery capacity; - Promoting peaceful cooperation between the Republic of Korea and the countries adjacent to the Mekong River.

Source: Kwak Seonggil (2018, pp. 13)

As shown in Table 2, it can be seen that the scope of cooperation with ASEAN, which is promoted by the South Korean Government, extends not only to the economic sphere, but also to society as a whole. The success of economic cooperation can be seen when tangible development results occur in the society of the partner country as a whole. For this purpose, cooperation should be developed based on the practical needs of the partner country.

b) The Government of the Republic of Korea promotes comprehensive mutually beneficial cooperation with ASEAN as globalization progresses. With the expansion of globalization, there is an increasing need for mutually beneficial and developing cooperation throughout society, rather than cooperation at the level of a simple expansion of foreign trade. Especially after the COVID-19 pandemic, there was a need for comprehensive cooperation in the field of health. This is due to the fact that after the COVID-19 outbreak, the importance of sharing advanced quarantine systems with the help of IT-technologies and rapid response capabilities within the framework of international cooperation has increased. Due to the military instability in the South China Sea region, the ASEAN countries are actively developing cooperation with the Republic of Korea in the field of defense and defense industry. In particular, cooperation in the development of fighter jets and defense weapons is actively carried out within the framework of cooperation in the defense industry with Indonesia. In addition, decommissioned warships of the Republic of Korea are being donated to Vietnam, the Philippines and Cambodia to help ASEAN countries strengthen their security capabilities.

Table 3. Five main tasks of the main policy of cooperation in the field of ODA of the Government of the Republic of Korea with ASEAN

5 main tasks of cooperation	Main cooperation programs of ODA
Comprehensive cooperation in the field of healthcare after the COVID-19 pandemic	<ul style="list-style-type: none"> - Transfer of quarantine experience related to infectious diseases; - strengthening cooperation in the field of healthcare; - Transfer and sharing of the South Korean disease management system.
Separation of the educational model of the Republic of Korea and support for the development of human resources	<ul style="list-style-type: none"> - Support for the creation of ICT-related infrastructure and training of specialists in the field of high technologies; - Expansion of Korean language teaching; - Expansion of cultural exchange through the creation of a Korean Cultural Center.
Bilateral cultural exchange	<ul style="list-style-type: none"> - Development and dissemination of a cultural platform for bilateral cultural exchange; - Promoting mutual understanding through the expansion of cultural exchanges via the Internet.
Support of infrastructure development for mutually beneficial development of agriculture and fishing village	<ul style="list-style-type: none"> - Transfer of experience in the modernization of South Korean farming and fishing villages; - Transfer of technology for growing South Korean agricultural products; - Transfer of technologies for storage and sale of agricultural products.
Strengthening cooperation in the field of social protection	<ul style="list-style-type: none"> - Joint response to global environmental crises and natural disasters; - Expansion of the transnational joint response to crime; - Support for environmental restoration in the area along the Mekong River.

Source: Park Seolhee (2022, pp. 21)

c) As a policy of foreign economic cooperation with ASEAN, the Government of the Republic of Korea is actively pursuing a policy of mutually beneficial cooperation through ODA. Economic cooperation with ASEAN through cooperation in the field of ODA especially supports the expansion of the digital economic policy framework through the transfer of advanced South Korean IT-technologies. The project to support the development of smart cities and the improvement of road transport systems are worth mentioning. Table 3 shows five key policy objectives and specific directions for implementing cooperation between the Republic of Korea and ASEAN in the framework of ODA (Park Seolhee, 2022).

Promotion of practical economic cooperation between the Republic of Korea and ASEAN and its achievements)

a) Achieving foreign economic cooperation through the expansion of complementary trade.

The Government of the Republic of Korea has created an institutional framework for the development of trade and investment with the ASEAN countries in order to lay the foundation for promising economic cooperation. In addition, the development of rural and underdeveloped areas, the modernization of transport and communications through the support of ODA is supported for the development of not only the economies of the ASEAN countries, but also society as a whole. This is a significant proof that the share and importance of ASEAN in the South Korean economy is increasing.

As shown in Figure 3, the volume of trade between the Republic of Korea and ASEAN increases annually after the promotion of the policy of foreign economic cooperation with ASEAN in 2017. The share of trade with ASEAN in the total trade volume of the Republic of Korea is ahead of Japan and the EU (Table 4).

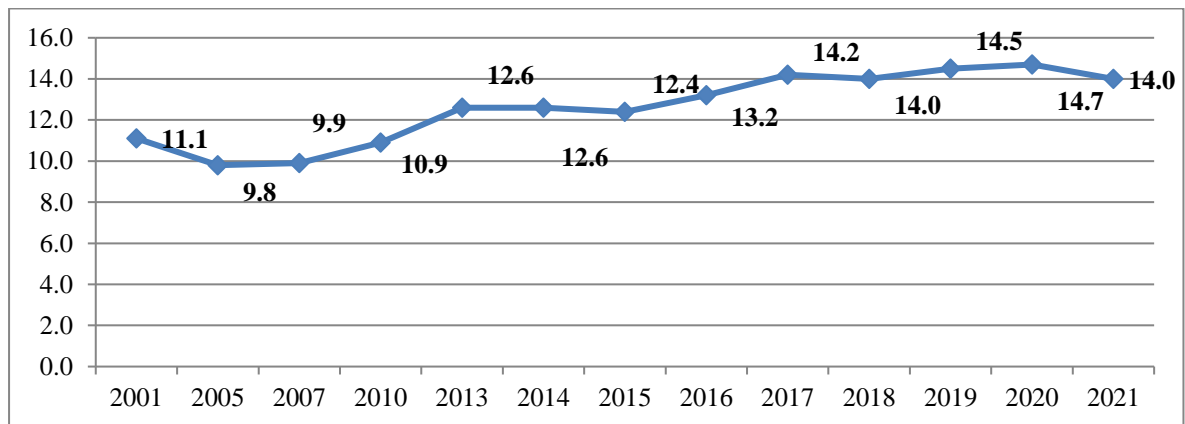


Figure 3. Share of trade of the Republic of Korea with ASEAN (%)

Source: Korea's major economic indicators (2023)

Nevertheless, the growth of trade with ASEAN leads to an increase in the positive trade balance of the Republic of Korea. These results suggest an element of a serious trade dispute called a trade imbalance in economic cooperation with ASEAN. The trade imbalance is a problem that needs to be solved if the South Korean Government intends to pursue a long-term mutually beneficial policy of foreign economic cooperation with ASEAN.

Table 4. Trade trends of the Republic of Korea by major countries (USD billion)

Rating	Country	2021				2022			
		Export	Import	Trade	Trade balance	Export	Import	Trade	Trade balance
1	China	1,629.1	1,386.3	3,015.4	242.9	1,557.8	1,545.7	3,103.5	12.1
2	ASEAN	1,088.3	677.1	1,765.3	411.2	1,249.2	825.4	2,074.6	423.8
3	USA	959.0	732.1	1,691.2	226.9	1,098.1	817.7	1,915.8	280.4
4	EU	636.1	659.3	1,295.4	-23.2	681.1	681.9	1,363.0	- 0.8
5	Japan	300.6	546.4	847.0	-245.8	306.3	547.1	853.4	- 240.8
6	Australia	97.5	329.2	426.7	-231.7	187.6	449.1	636.7	- 261.4
7	Taiwan	242.9	234.9	477.7	8.0	262.0	282.7	544.7	- 20.7
8	Saudi Arabia	33.3	242.7	276.0	-209.5	48.7	415.6	464.2	- 366.9
9	Hong Kong	374.7	22.5	397.1	352.2	276.5	18.8	295.3	257.8
10	India	156.0	80.6	236.6	75.5	1888	89.0	277.7	99.8
Total		6,444.0	6,150.9	12,594.9	293.1	6,837.5	7,312.2	14,149.7	- 474.7

Source: Trade Statistics of the Republic of Korea (2023)

The Republic of Korea exports to ASEAN countries a large share of intermediate goods and a very low share of raw materials exports. In particular, as exports of machinery and intermediate goods increase, due to the revival of investments by South Korean companies in Vietnam, the trade surplus with Vietnam continues to increase. The Republic of Korea's exports to ASEAN are largely concentrated in Vietnam and Singapore (Table 5). Nevertheless, the Government of the Republic of Korea should actively promote the policy of diversification of export markets in order to expand foreign economic cooperation with other ASEAN countries.

Table 5. – Dynamics of exports of the Republic of Korea to the main ASEAN countries (USD million, %)

Country	2019		2020		2021		2022	
	Amount	%	Amount	%	Amount	%	Amount	%
Vietnam	48,178	50.7	48,511	54.5	56,729	52.1	60,972	48.8
Singapore	12,768	13.4	9,828	11.0	14,149	13.0	20,216	16.2

Source: Korea's major economic indicators (2023)

The Republic of Korea's imports from ASEAN countries also account for the largest share in Vietnam (Table 6). This is due to the fact that many South Korean companies export intermediate goods to Vietnam, and then import them again as finished products. Or because of the structure in which intermediate goods are imported from Vietnam and produced in the Republic of Korea as finished products. Thus, it can be seen that the structure of trade between the Republic of Korea and Vietnam has many complementary parts. Ultimately, a complementary trade structure becomes a complementary structure, a model of economic cooperation between the two countries.

A complementary trade structure is a common phenomenon between the Republic of Korea and the ASEAN countries. Among the 10 main items of trade of the Republic of Korea with ASEAN, export goods include semiconductors, marine structures and parts for ships, steel sheets, wireless communication devices, automobiles, flat displays and sensors.

Table 6. Dynamics of imports of the Republic of Korea by ASEAN countries (USD million, %)

Country	2019		2020		2021		2022	
	Amount	%	Amount	%	Amount	%	Amount	%
Vietnam	21,072	37.5	20,579	37.5	23,966	35.4	26,726	32.4
Indonesia	8,820	15.7	7,595	13.9	10,725	15.8	15,737	19.1
Malaysia	9,280	16.5	8,893	16.2	10,456	15.4	15,252	18.5
Singapore	6,660	11.9	8,438	15.4	10,691	15.8	10,348	12.5
Thailand	5,318	9.5	5,197	9.5	7,015	10.4	7,881	9.5
Philippines	3,658	6.5	3,086	5.6	3,894	5.8	5,177	6.3
Myanmar	595	1.1	466	0.8	446	0.7	629	0.8
Cambodia	336	0.6	318	0.6	342	0.5	409	0.5
Brunei	408	0.7	215	0.4	123	0.2	295	0.4
Laos	39	0.1	44	0.1	9	0.1	85	0.1
Total	56,186	100	54,831	100	67,707	100	82,539	100

Source: Korea's major economic indicators (2023)

The Republic of Korea's imports from ASEAN include not only natural resources such as natural gas, coal, crude oil and raw materials for sulfur, but also a number of machinery and household appliances such as semiconductors and computers: intermediate goods make up the majority of export and import goods between the Republic of Korea and ASEAN.

Like the Republic of Korea, ASEAN promotes export-oriented economic development. For this reason, ASEAN countries are characterized by a relatively high degree of dependence on imports of intermediate goods for subsequent exports. The result of foreign economic cooperation through complementary trade will be the formation of a complementary economic structure in the long term. By developing a complementary trade structure with ASEAN, the South Korean Government reduces trade dependence on China and strengthens economic cooperation with ASEAN by creating a division of labor system.

In general, the fact that the Republic of Korea's trade with ASEAN has increased significantly can be assessed positively. It is also a very positive result that ASEAN has established itself as an alternative trading partner of China. However, the problem of an excessively high share of specific countries and intermediate goods in trade with ASEAN is a risk factor for the economy of the Republic of Korea. In addition, in the long term, the imbalance in the trade balance is an important task that needs to be solved for the development of mutually beneficial economic cooperation between the Republic of Korea and ASEAN.

b) The achievement of economic cooperation through the conclusion of the FTAs and RCEP (Regional Comprehensive Economic Partnership).

RCEP (Regional Comprehensive Economic Partnership) is 10 ASEAN member states and 5 states with which ASEAN has already signed the FTAs (Australia, PRC, New Zealand, Republic of Korea, Japan) entered into force in February 2022, and RCEP accounts for 29% of world GDP, 30% of the world population and 25% of world trade in goods and services. This is the largest economic integration in the world as a regional integration. The entry into force of the RCEP agreement is expected to expand access to the market of the signatory countries,

including products, services and investments, as well as strengthen cooperation in the supply chain. For this reason, it is possible to jointly respond to inflation, thereby increasing the effect of mutually beneficial foreign economic cooperation.

The key political objectives for the development of foreign economic cooperation between the Republic of Korea and ASEAN are as follows (Choi Bonki, 2021).

Firstly, the establishment of a basis for economic cooperation through industrial and financial standardization between the Republic of Korea and ASEAN. Thanks to the RCEP conclusion, conditions were created for the Republic of Korea to transform the main ASEAN countries into production bases. As a result, the number of South Korean financial companies that are members of ASEAN is significantly increasing. For the development of foreign economic cooperation between the Republic of Korea and ASEAN, it is important to create a basis for universal economic cooperation, including not only industrial and financial standardization, but also support for startups in the field of ICT.

Secondly, the elimination of unjustified non-tariff barriers and increasing the transparency of the customs system: the elimination of unreasonable delays in customs clearance or restrictions on imports and exports, as well as ensuring the transparency of the customs system. Such cooperation leads to significant trade and investment facilitation (Table 7). First of all, South Korean companies will be given more opportunities to receive tariff benefits in various ways in order to create a favorable export environment. As a result, on the one hand, the Republic of Korea promotes the expansion of trade through bilateral FTAs with ASEAN countries, and on the other hand, carries out mutually beneficial economic cooperation through RCEP.

Table 7. Final level of tariff abolition after the RCEP agreement with the Republic of Korea and the ASEAN countries (as of 2022)

Level of abolition of tariffs on exports of the Republic of Korea to ASEAN			Level of abolition of tariffs on imports of the Republic of Korea to ASEAN		
1	Singapore	100%	1	Brunei	99,9%
2	Brunei	100%	2	Indonesia	98,6%
3	Myanmar	99,1%	3	Laos	98,2%
4	Vietnam	94,5%	4	Singapore	98,0%
5	Philippines	92,4%	5	Malaysia	96,0%
6	Malaysia	91,4%	6	Vietnam	95,4%
7	Indonesia	89,7%	7	Cambodia	94,2%
8	Thailand	89,3%	8	Myanmar	93,8%
9	Cambodia	69,0%	9	Philippines	90,0%
10	Laos	51,4%	10	Thailand	89,7%

Source: Choi Bonki (2021, pp. 19)

Thirdly, to build a new global value chain and pursue common interests by strengthening cooperation in the supply chain. In a situation where the global supply chain and industrial competitiveness are strengthening, ASEAN is not only a manufacturing base with rich production and human resources, but also a huge consumer market. With the conclusion of the RCEP agreement, South Korean companies' investments in ASEAN are rapidly increasing, contributing to an increase in local added value and job creation.

When RCEP entered into force, the export market of the Republic of Korea to ASEAN countries expanded. ASEAN tariffs on automobiles, steel and petrochemicals, which are the main export areas of South Korean conglomerates, as well as on automotive parts, textiles and cosmetics, which are the main export areas of SMEs, have also been abolished. On the other hand, while the RCEP was entering into force, the market for imports from ASEAN in the Republic of Korea also expanded. The opening of the market has expanded the Republic of Korea mainly for agricultural and fishing products, as well as intermediate goods. ASEAN is at the center of the “Policy of Foreign Economic Cooperation of the Southern Countries” in the context of the development of the multilateral trading system conducted by the South Korean Government. For this reason, the Government of the Republic of Korea promotes close mutually beneficial economic cooperation with ASEAN in various fields for long-term economic development.

c) Achieving mutually beneficial economic cooperation through investments of South Korean SMEs in ASEAN

South Korean SMEs are actively engaged in economic cooperation activities by moving production bases to ASEAN countries. The purpose of South Korean SMEs’ investments in ASEAN is to promote mutually beneficial foreign economic cooperation to form a new global value chain with the support of the Government of the Republic of Korea.

Investments in ASEAN require investments with a long-term perspective in order to occupy the market, and not for the purpose of obtaining short-term profits. In addition, ASEAN investments should be aimed at long-term and mutually beneficial economic cooperation, and not at simple investments to expand the market. An analysis of the advantages and risk factors to be taken into account when investing directly in ASEAN is presented in Table 8.

Table 8. Analysis of ASEAN direct investments conditions

Factor	Advantage	Risk factor
Labor use area	<ul style="list-style-type: none"> - Cheap wages - A young and huge team - Abundance of available human resources 	<ul style="list-style-type: none"> - A sharp increase in wages - Rapid staff turnover
Infrastructure status	<ul style="list-style-type: none"> - Expansion of investments in infrastructure at the state level - Gradual increase in the level of infrastructure 	<ul style="list-style-type: none"> - Low level of energy, communication, logistics (automobile, port) infrastructure
Economic growth potential	<ul style="list-style-type: none"> - High rates of economic growth - Increase in purchasing power by increasing income 	<ul style="list-style-type: none"> - Intense competition between the main ASEAN countries.
Economic policy status	<ul style="list-style-type: none"> - Foreign investment promotion system - Advantages of ASEAN economic integration - National policy to support the manufacturing industry 	<ul style="list-style-type: none"> - Weak system of protection of foreign investments - Complex investment laws, tax payment system, etc. - Introduction of new rules, such as environmental regulations
State of the financial system	<ul style="list-style-type: none"> - Constant growth in demand as the market matures 	<ul style="list-style-type: none"> - Unstable exchange rate volatility - Weak financial infrastructure (money transfers, exchanges, etc.)

Source: Kwak Seonggil (2018, pp. 26)

Prerequisites for active investments of South Korean SMEs in ASEAN countries are as follows:

Firstly, the problem is that the profitability of production is not suitable due to rising prices for factors of production, such as wages and rents in China. In other words, South Korean SMEs have started transferring manufacturing facilities from China to ASEAN. Large ASEAN member countries are becoming new production bases to replace China. The main reason is the growth of production costs in China. In particular, as shown in Table 9, land lease prices and industrial water use prices in China are higher than in the Republic of Korea, and the growth rate over the past 10 years has been faster than in the Republic of Korea.

Table 9. Comparison of prices for factors of production in the Republic of Korea and China

Division	Republic of Korea		China	
	2008	2018	2008	2018
Cost of renting land (m ²)	218 USD	314 USD	328 USD	601 USD
Cost of water use (m ²)	0.251 USD	0.276 USD	0.412 USD	0.652 USD
Payment for the use of electricity in industry (kWh)	0.055 USD	0.092 USD	0.095 USD	0.098 USD

Source: Kwak Seonggil (2018, pp. 28)

Wages in China have also risen sharply, and the gap with ASEAN has widened significantly since 2010. As shown in (Figure 4), an analysis of the wage level conducted in 2019 shows that the average monthly wage in China's manufacturing industry is significantly higher than in the ASEAN countries.

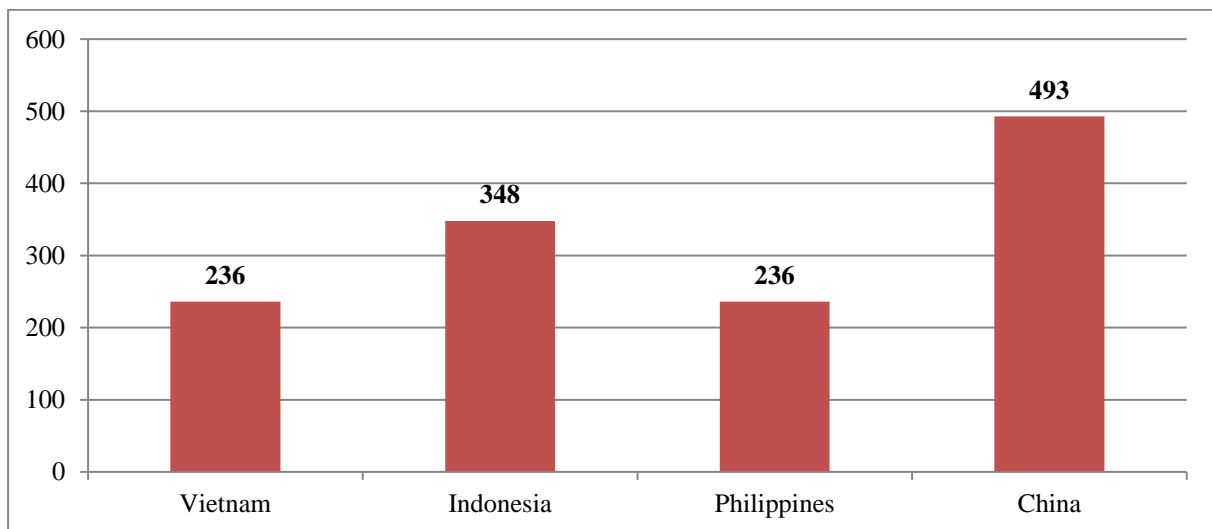


Figure 4. Comparison of average monthly wages in the manufacturing sector between ASEAN and China (2019 USD)

Source: Kwak Seonggil (2018, pp. 28)

Secondly, the changes in the international situation after the trade conflict between the United States and China, and the growth of the ASEAN domestic consumer market.

The recent military and economic conflict between the US and China is expected to enhance the role of ASEAN as a manufacturing base. To avoid tariffs imposed by the United States on products manufactured in China, South Korean companies are also actively seeking to relocate their production bases. Vietnam, Thailand and Indonesia are attracting attention as new production bases for South Korean companies. The Government of the Republic of Korea is also promoting a policy to strengthen economic cooperation with ASEAN countries in order to reduce economic dependence on China and diversify production networks in the face of growing global economic instability. The Republic of Korea's investments in ASEAN increased by an average of 8.9% per year, especially in the period before the COVID-19 pandemic (2010-2019), showing a sharper growth than China (5.2%).

As shown in (Figure 5), the difference in investment between ASEAN and China was only US\$ 7.8 billion in 2010, but US\$ 37.5 billion in 2019, which shows a big difference (Lee Daehwa, 2023).

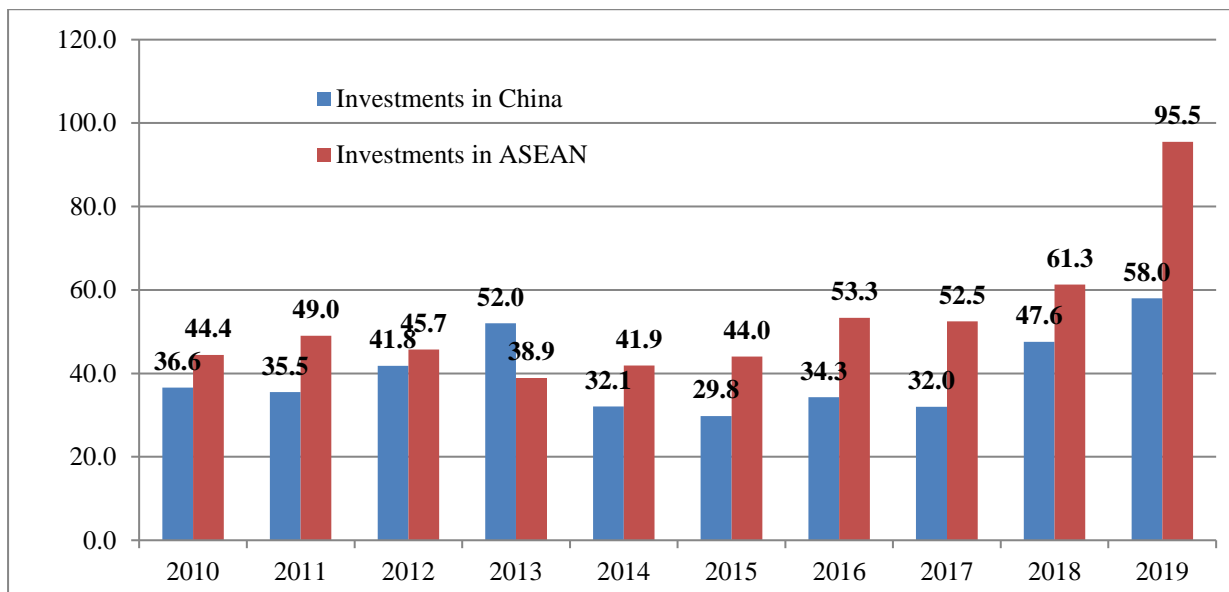


Figure 5. Trends in direct investments of the Republic of Korea in ASEAN and China (USD billion)

Source: Lee Daehwa (2023, pp. 16)

Table 10 shows the results of a study of trends in foreign direct investment, where the role of the Republic of Korea, which pursues an aggressive investment policy in the ASEAN organization, is quite noticeable. 88.6% of the Republic of Korea's foreign direct investment in ASEAN in 2019 was concentrated in Vietnam, Singapore and Indonesia. The deepening of investment concentration in the three major countries has not changed significantly, accounting for 82.4% in 2022.

Table 10. Trends of direct investments of the Republic of Korea in ASEAN countries (USD million, %)

2019			2021			2022		
Country	Amount	Share (%)	Country	Amount	Share (%)	Country	Amount	Share (%)
Vietnam	4,615	45.1	Vietnam	2,514	27.8	Singapore	3,001	34.3
Singapore	3,462	33.8	Singapore	2,514	27.7	Vietnam	2,754	31.5
Indonesia	990	9.7	Indonesia	1,832	20.2	Indonesia	1,451	16.6
Myanmar	287	2.8	Malaysia	843	9.3	Malaysia	619	7.1
Cambodia	244	2.4	Cambodia	546	6.0	Myanmar	346	4.0
Malaysia	240	2.3	Myanmar	465	5.1	Cambodia	284	3.3
Philippines	239	2.3	Thailand	220	2.4	Thailand	142	1.6
Thailand	93	0.9	Philippines	86	0.9	Laos	74	0.8
Laos	69	0.7	Laos	39	0.4	Philippines	73	0.8
Brunei	0	0.0	Brunei	1	0.0	Brunei	0.0	0.0
Total	10,240	100	Total	9,060	100	Total	8,744	100

Source: Lee Daehwa (2023, pp. 18]

As shown in (Figure 6), the purpose of direct investments of the Republic of Korea in ASEAN is to enter the local market. The trend is that the share of direct investment directed to local production in ASEAN countries on the basis of low wages has significantly decreased. This indicates that the goal of direct investment is shifting from production based on low wages to market expansion based on local purchasing power. This is followed by the breakthrough of protectionist trade, access to third countries and export promotion. Thus, there is a clear tendency to reduce low wages and the development of resources, which are the main goals of the initial investments of South Korean companies in ASEAN.

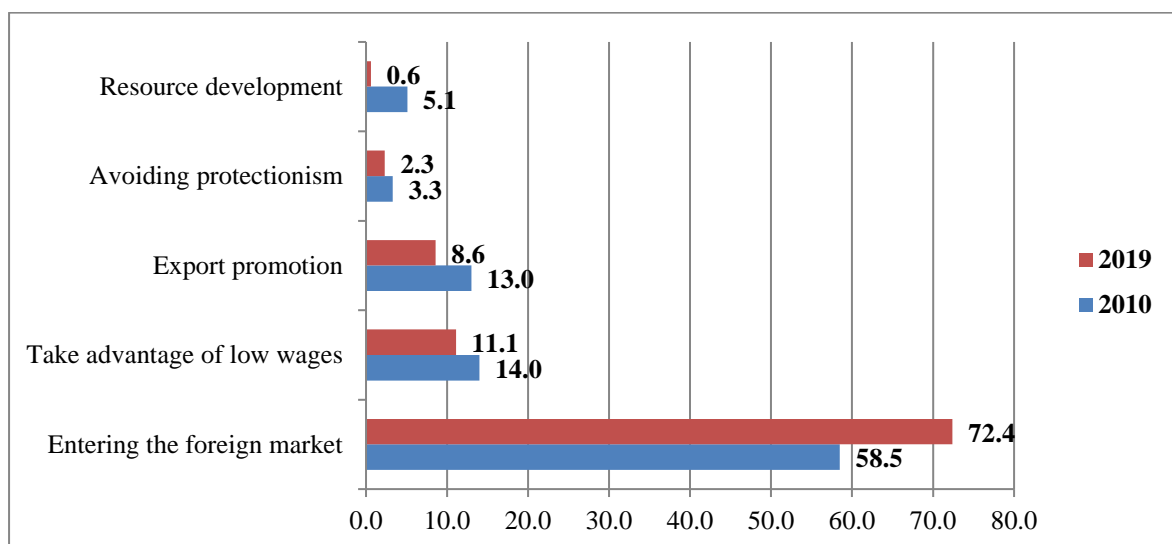


Figure 6. Share of foreign direct investment of the Republic of Korea in ASEAN (%)

Source: Lee Daehwa (2023, pp. 19]

As can be seen from table 11, direct investments of South Korean companies in ASEAN are concentrated in Vietnam. This is the result of large-scale investments in Vietnam since the 2000s by large corporations such as Samsung Electronics and Hyundai. Such investments by South Korean companies contributed to Vietnam's economic growth, but also caused a sharp increase in the trade surplus of the Republic of Korea. This has led to an increase in the imbalance in economic cooperation between the Republic of Korea and Vietnam. However, the economic cooperation of the Republic of Korea, focused on Vietnam, has led to the alienation of economic cooperation with other ASEAN countries. This is becoming an important problem that must be solved in long-term foreign economic cooperation with ASEAN.

Table 11. Trends in direct investment in the manufacturing industry of the Republic of Korea by ASEAN countries (USD million, %)

Country	2019		2020		2021		2022	
	Amount	Share (%)	Amount	Share (%)	Amount	Share (%)	Amount	Share (%)
Vietnam	2,614	62.3	1,734	60.9	1,374	40.5	1,724	50.4
Indonesia	479	11.4	573	20.1	820	24.1	1,001	29.3
Malaysia	176	4.2	33	1.2	757	22.3	453	13.2
Singapore	716	17.1	313	11.0	314	9.2	83	2.4
Thailand	31	0.7	56	2.0	46	1.3	74	2.2
Philippines	82	2.0	72	2.5	36	1.0	32	0.9
Myanmar	50	1.2	53	1.9	39	1.1	38	1.1
Cambodia	44	1.1	12	0.4	9	0.3	14	0.4
Laos	0	0.0	0	0.0	0	0.0	0	0.0
Total	4,193	100	2,846	100	3,395	100	3,418	100

Source: Lee Daehwa (2023, pp. 20)

d) Investments of South Korean SMEs in ASEAN represent a case of establishing a production base as a partner company after direct investment by a large South Korean company. South Korean SMEs cooperating with large corporations have a higher level of technology and productivity than labor-intensive companies, and also have global competitiveness. Most of these South Korean SMEs are located near the Samsung Electronics plant in Hanoi, Vietnam, and are also located around the Hyundai Motors Company plant in Bekasi, Indonesia. These South Korean SMEs are mainly involved in the globalization strategy of Samsung Electronics and Hyundai Motor Company (Moon Jihyeon, 2020)

e) Expansion of foreign economic cooperation through ODA projects.

The ASEAN countries are mainly developing countries, and the importance of international cooperation for rapid urbanization, prevention and treatment of infectious diseases after the COVID-19 pandemic, and preparation for natural disasters caused by climate change is increasing. In line with the actual needs of ASEAN, the South Korean Government is increasing the share of ODA support for urban development and infrastructure expansion to solve transport problems, modernize water quality management and water supply, improve health and sanitation through ICT technologies, and create an advanced education system.

The six partner countries of the Republic of Korea for ODA within the framework of ASEAN are Cambodia, Indonesia, Laos, Myanmar, the Philippines and Vietnam. The scale of international aid has been decreasing since 2013, but support for the Republic of Korea within the framework of ASEAN ODA is growing.

The Republic of Korea's ODA is focused on middle-income countries such as Vietnam, Indonesia and the Philippines, but the international community's ODA is focused on helping the poorest ASEAN countries. The main directions of the Republic of Korea's ODA for ASEAN include urban development 44.8%, modernization of transport 34.1%, water resources management and sanitation 11.5%, rural development 6.6% and modernization of health and sanitation 3.0% (Lee Sangsoon, 2021).

For about 40 years, since 1960, the Republic of Korea has been achieving economic growth, receiving various assistance from the international community. However, since 2000, the Republic of Korea has become a donor country in the international community. In addition, the Republic of Korea is a country that has transformed from a developing country into the structure of the economy of a developed country. For this reason, the Republic of Korea, which has the experience of a developing country, can transfer and share its experience of economic development with developing countries. It means that the Republic of Korea has become a country that can present a model of foreign economic cooperation for mutually beneficial development between countries in the international community.

Recommendations

In order to raise the mutually beneficial cooperation between the Republic of Korea and ASEAN to a higher level, it is necessary to implement the following recommendations:

Firstly, it is necessary to diversify trade and investments concentrated in Vietnam. Trade and investment by the Republic of Korea with Vietnam is constantly increasing, but with Indonesia, Thailand, Singapore and the Philippines, depending on the time, there is stagnation or a downward trend. In addition, the Republic of Korea is still at a low level of economic cooperation with ASEAN countries such as Cambodia, Laos and Myanmar. In order to diversify economic cooperation with ASEAN, the Government of the Republic of Korea should improve the terms of trade and investment, and also expand economic cooperation by concluding bilateral free trade agreements with Indonesia and Malaysia, which have a larger economy than Vietnam. In addition, it is necessary to increase the volume of ODA support projects for Cambodia, Laos and Myanmar in order to expand long-term mutually beneficial economic cooperation.

Secondly, the South Korean Government should develop practical measures to improve the trade deficit of the ASEAN countries. Since ASEAN serves as an assembly production base for the manufacturing industry, and therefore the artificial reduction of the trade deficit of the Republic of Korea is limited due to its high dependence on imports of intermediate goods and spare parts. Technically, it is desirable to resolve the trade imbalance by expanding trade between the two parties. Therefore, both parties need to jointly develop and promote policies to increase trade volume. The Republic of Korea should promote the expansion of imports of raw materials from ASEAN and increase the reverse import of products produced by local investments of South Korean SMEs. In addition, measures to

expand imports of resources, agricultural and marine products from ASEAN, and expand economic cooperation through ODA projects should be promoted as a way to reduce the trade deficit. As an ODA project that can promote cooperation between the Republic of Korea and ASEAN, it is worthwhile to strengthen support for the ICT sector, the agricultural sector and the natural resource processing sector.

Thirdly, in the medium and long term, ASEAN should not be just considered as a consumer market for expanding exports, but also mutually beneficial partnerships through expanding regional cooperation in the interests of military security should be formed. Now ASEAN plays an important role not only in terms of the global economy, but also international cooperation in the field of global security. For this reason, cooperation between the Republic of Korea and ASEAN is expanding for the sake of the security of the Indo-Pacific region.

Conclusion

“Policy of Foreign Economic Cooperation with the ASEAN countries” of the Government of the Republic of Korea has the characteristics of a new foreign economic policy in the context of the development of the multilateral trading system. It is aimed at actively diversifying risks in accordance with the strengthening of protectionist trade and increasing uncertainty in the global economic environment.

In particular, the foreign economic cooperation of the Government of the Republic of Korea with ASEAN is a new policy of regional economic cooperation aimed at creating a mutually beneficial regional structure. To achieve this, the Republic of Korea is expanding foreign economic cooperation in the manufacturing industry by scaling up direct investments in ASEAN and moving production facilities to form a new global value chain. The Republic of Korea also strives for mutually beneficial economic cooperation, transferring its experience of economic development to ASEAN through ODA projects.

As a result of foreign economic cooperation, the Republic of Korea and ASEAN are becoming close global partners with the aim of mutual economic development. Moreover, the Republic of Korea is a country that in a short period of time has turned from a developing country into an advanced country thanks to democratization and industrialization. Therefore, for the ASEAN countries, the economic development model of the Republic of Korea can serve as a practical model of foreign economic development policy through close mutually beneficial economic cooperation.

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VARIABLES OF QUANTIFYING REPUTATIONAL DAMAGES RESULTING FROM UNFAIR COMPETITION ACTIONS

Iulian MORARU^{*1}

Abstract: *The problem of quantifying the reputational damage resulting from unfair competition actions derives mainly from the lack of contextually established criteria. In the same sense, the lack of relevant judicial precedents amplifies the precarious state of the system of indicative benchmarks in order to assess the damage to reputation as a result of affecting the rights and legitimate interests of the victims of unfair competition actions. Foreign methodological systems for quantifying damages caused by unfair competition actions could represent points of reference for the domestic legislator in the idea of solving practical difficulties in the process of assessing damages caused by unfair competition actions. An eloquent example could be considered the French model for evaluating the economic damage resulting from actions of unfair competition, developed by notorious practitioners in the field in question. The methodological sheets are generically called „La réparation du préjudice économique. Fiches méthodologiques et glossaire - 3e édition (2024)“.*

Keywords: *quantification, assessment, harm, damage, unfair competition, criteria, methodology.*

UDC: 346.546:346.9(478)

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Introduction

At the current stage, in the Republic of Moldova, there doesn't exist a solid theoretical or practical basis in terms of harm assessment (regardless of its form). In the same sense, it is worth mentioning the fact that in France, for example, there have been developed methodological sheets for the reparation of economic damage, the group of authors of the sheets in question being composed of local practitioners and theorists.

By reporting the given aspect to the subject of the research, the reason for its approach resides in the lack of a theoretical and practical framework in the matter of evaluating reputational damages in the context of unfair competition, and the purpose of the research derives from the necessity of the existence of such a framework to the extent that there is a sufficient normative spectrum in this regard.

The practical importance of the subject in question is determined by the creation of guidelines in terms of assessing the damage resulting from the harm to the undertaking's reputation in the context of unfair competition.

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Thus, through this paper, it is proposed to approach the issue derived from the subject in question, the pertinent French jurisprudence, the domestic normative framework in the matter, as well as the configuration of the criteria and variables for quantifying reputational damages in the matter of unfair competition.

Literature review

The relevant literature in the matter is not a rich one in the quantitative aspect, as a small number of authors have written by the moment on the subject in question. Among the mentioned sources it is worth specifying the following ones:

- Gorincioi, C. (2019). Cercetarea instrumentelor juridice de contracarare a actelor de concurență neloială. Teză de doctor în drept. [Research of legal instruments of counteracting the unfair competition acts. Doctoral thesis in law] This source is an integrated synthesis of the specifics of the system of unfair competition actions, as well as of the available legal mechanisms to counteract these actions. The theoretical significance of the thesis lies in the fact that the author approaches the topic from the perspective of the main issues arising from the particular subject.
- Castraveț, D. (2019). Răspunderea civilă delictuală pentru actele de concurență neloială. Teză de doctor în drept. [Tortious civil liability for acts of unfair competition. Doctoral thesis in law]. This paper is a bibliographical reference for consultation in the sense of defining the main criteria for quantifying damages as a result of unfair competition actions.
- Karsenti, C. (2022). L'évaluation du préjudice d'atteinte à l'image. [Image damage assessment]. This paper is the main foreign source for the present research, considering that it provides the main theoretical points that sustain the given results.
- Prieto, C. (2022). Le préjudice moral résultant des pratiques anticoncurrentielles. [The moral damage resulting from anticompetitive practices]. The named article is used for creating a parallel perspective on the subject of quantifying damages arising from anti-competitive practices.
- Nussenbaum, M. (2010). L'appréciation du préjudice d'atteinte à la marque et à son image. [Appreciation of the damages caused to the trademark and its image]. This paper is used to define the theoretical nuances of the approached subject.

Data and Methodology

The methodological arsenal used in the context of the elaboration of this paper consists in particular of:

- Logical-formal method. The benefit of using this method lies in the possibility of a proper analysis of theoretical ideas, as well as previous practical findings through deduction and induction operations in order to identify the compliance of those findings with the related jurisprudential trends;
- Legal-comparative method. In view of the application of this research method, the necessary conditions are created in order to contrast the theoretical-practical and legislative aspects, as a result of which relevant conclusions can be drawn in order to improve the existing conceptual framework and unify current practice.

Apart from that, during the research there will be also used the content analysis method and the analysis of social, official, public, numerical and nonnumerical documents.

All the methods listed and analyzed above will be used alternatively and as a whole.

General considerations regarding compensation awarded for economic damage

Generally speaking, it is believed that: (i) The general principle of assessing the economic damage consists in comparing the generated situation (the real scenario) with the situation in which the plaintiff would have been in the absence of an event that has led to liability (the normal situation); (ii) The main question in assessing the damage lies in the determination of what would have occurred in the absence of the harmful event. The respective situation cannot be observed directly, a fact which generates the need to formulate some hypotheses for the reconstruction of the given situation. Subsequently, damages are determined by comparing the observed situation (harmful event that occurred) with this normal situation (the unobservable situation generated if the harmful event had not occurred); (iii) Once the normal situation is determined, the economic damage can be quantified by realizing the difference between what would have been in the absence of the damaging event and the actual generated situation. For example, the estimated profit in the normal situation is compared with the actual profit made by the victim and allows the deduction, through the difference, of the economic damage corresponding to the loss of profit suffered by the victim. [FICHE n°3 a Comment évaluer un préjudice économique?, p.1]

Specific aspects regarding the assessment of damage in the context of unfair competition

In the existing doctrine (in particular, the recent one), it has been raised the issue of the difficulty of assessing the damage following unfair competition actions. Moreover, in particular situations, it was stated that the damage caused as a result of unfair competition actions is, in fact, impossible to quantify. [Gorincioi, p. 140]

Initially, it is required to mention the clarification made by some authors [Nussenbaum, p. 18], according to which a theoretical and practical distinction must be made between the

following aspects: (i) the damage caused by the violation of the victim's trademark rights, which involves the damage caused by the violation of intellectual property rights and which is likely to consist of a.) lost profit (if the infringement of intellectual property rights has caused loss of sales to the victim of the author's actions) or, alternatively, b.) an increased royalty that would take into account the unauthorized nature of the use of the rights of intellectual property; (ii) the damage caused to the reputation of the trademark, which, in theory, represents a separate type of damage, a consequence of the previous type and which can be repaired by a.) estimating the possible subsequent loss of income due to the reduction of the distinctive and attractive character of the trademark or, alternatively, b.) the costs of rebuilding the reputation of the trademark, damaged by reprehensible actions. Indeed, from an economic point of view, trademark reputation has all the elements of an asset (good): it is created by investment and disappears by oblivion, if investment is stopped; (iii) moral damage, in cases where the violations concern trademark values and needs. Such type of damage is estimated by the court through a lump sum and can later be associated with the type of damage addressed previously.

Those distinctions were perfectly illustrated by the decision of the Paris Court of Appeal of 03.09.2010 in the case of Louis Vuitton and Christian Dior Couture v. eBay Inc. and eBay AG [CA Paris, ch. 5-2, September 3, 2010, RG 08/12821] regarding the sale of the contested products on eBay's web pages.

The trial court accepted the reasoning invoked by the victims (even though the Paris Court of Appeal reduced the amount awarded due to the reduction of the geographical scope and the infringement rate used as the basis of calculation), which sought to distinguish between: (i) the damage to trademark infringement related to the unauthorized use of the Louis Vuitton and Christian Dior Couture trademarks: the infringement of those trademarks was compensated based on the right of indemnity approach; (ii) the damage related to the infringement of the reputational regime of the respective trademarks, because eBay gave high visibility to the illegal sales of the given products: that category of damage, estimated on the basis of the cost of restoring the damaged reputation of the trademark, was determined on the basis of the revenue obtained by eBay from the publication on its sites of advertising of the products infringing the rights in question, by multiplying it by the coefficient 4, taking into account the increased difficulty and cost of countering the infringement of the reputational right in relation to the difficulty and cost of challenging that infringement.

The court retained that the wide distribution of the given advertising and the significant reputation of the signs Christian Dior Couture and Louis Vuitton, which are the subject of significant and constant communication campaigns, must be taken into account. This coefficient (4) is also justified by the "viral" character of the dissemination of messages on the Internet, in particular by trademark-damaging advertisements and the much higher costs by reference to advertisements placed on eBay, as well as by the counter-campaigns that right holders on the targeted trademarks will have to deploy them on more traditional media channels

to be consistent with their image and which are more expensive than advertisements placed on the Internet; (iii) moral damages based on the harm caused to the right holders in the context of their efforts and the values (which the trademarks in question carry) of creativity, originality, quality and refinement.

The same approach was applied in more recent cases (2013). In the case between Bouygues Telecom and Iliad (Free Mobile) concerning the defamation of the undertaking's reputation following the exchange of comments between the directors of the two telecommunications groups. [T. com. Paris, 15th ch., February 22, 2013, RG 2012076280.] The Commercial Court of Paris ordered Iliad to pay 10 million euros to Bouygues Telecom in relation to the loss of customers as compensation, as well as for the damage to its trademark reputation.

In the litigation between Christian Dior Couture and Cheyenne Freedom (John Galliano), following John Galliano's reprehensible behaviour and remarks [CA Paris, ch. 5-5, May 7, 2015, RG 14/01588], stated in public and quickly disseminated on social networks, during which he proclaimed his identity and activity of designer, thus placing himself in the position of being known throughout the world, his actions having a significant impact on the trademark of which he was a representative. In the given context, the trial court established a compensation of 1 million euros as reputational damage and 150,000 euros as moral damages, although the court of appeal annulled the previously specified decisional act which concerned the Cheyenne company, but which referred in fact to the personal behaviour of its director.

Returning to the methodological sheets developed by the Paris Court of Appeal in 2017, noting that none of the respective methodological sheets is dedicated to damage caused to the undertaking's reputation, the last type of damage is addressed in sheet no. 5 entitled "How to repair moral (extra-patrimonial) damages?" The damage caused to the reputation is therefore seen as an aspect of the moral damage detached from the trademark and its reputation, being connected to the undertaking as a whole.

According to the doctrine, the moral damage of an undertaking has two aspects: (i) the external aspect, the context in which the damage, for example, due to discredit to the reputation of the undertaking is approached, under the conditions that it carries values (professional, spiritual, philosophical or political) that constitute his identity; (ii) the internal aspect, the damage caused resulting in a diffuse deterioration of morale within the undertaking and a loss of confidence in its future, by increasing the number of resignations or the disinterest of candidates for employment.

As Professor Catherine Prieto has rightly pointed out, "Recently, the concept of moral damage has been progressively renewed and expanded both conceptually and in areas of law where it was not yet very present; a very bold jurisprudence on compensation for damages resulting from unfair competition already appears to be influencing the jurisprudence on compensation owed to victims of cartels and abuse of dominant position; thus, the concept of

non-pecuniary damage could not only be imposed, but also renewed, and go beyond damage to the undertaking's reputation to cover damage to its inner spirit. [Prieto, p. 91]

This evolution, which centralizes the undertaking's reputation, honour or even its inner spirit, now takes a considerable extent beyond the traditional problems related to intellectual property or even those of unfair competition. Any damaging act, whatever it may be, can cause reputational damage not only to the trademark but also to the undertaking as a whole. [Karsenti, p. 196]

In this field, which varies from trademark reputation (in the eyes of customers) to an institutional reputation, in the eyes of all stakeholders (government, suppliers, financial partners, employees, etc.), it is important to define the practical approach to be adopted to assess more precisely the damage to the undertaking's reputation by combining the appropriate means of proof.

Indeed, it could be anticipated with regard to the methodological contribution of the informational sheets of the Paris Court of Appeal that they would have led to an improvement in the justification of claims for compensation for reputational damage. However, it should be noted that a reading of recent decisions indicating the existence of a claim for damages in relation to reputational damage continues to show that: (i) most decisions rejecting claims for such damages are explained by the lack of evidence provided by the victim in support of his/her position [CA Paris, ch. 5-4, March 16, 2022, RG 21/00684; CA Paris, ch. 5, February 10, 2022, RG 19/03034; CA Paris, ch. 5-4, January 5, 2022, RG 19/19600]; (ii) however, when the existence of a violation is proven, very often the amount awarded is lump sum and symbolic due to the lack of definite proof of the quantum of damage caused. Thus, for example, in a litigation it was retained: "It is necessarily inferred that there is a damage, even if only moral, from an act of economic parasitism. Through the lens of the communicated elements, the Court is in a position to assess the damage suffered by the company DCF, as the successor of the company Pressimmo, as a result of the committed acts of parasitism, at a global amount and fixed by the court at 10,000 euros as damages for damage to its reputation in the context of a communication that creates confusion in the undertaking's "success story". [CA Paris, ch. 5-4, January 5, 2022, RG 17/02924]

On the other hand, successful claims are those that developed the original methodology for trademark infringement.

In the case of SA Christian Dior Couture SA vs. INDITEX [CA Paris, ch. 5-1, February 1, 2022, RG 20/03318], we find the notion of damage to the reputation of the Dior trademark resulting from a campaign to discredit Zara France and Inditex in relation to acts of parasitism: "These acts also had harmful consequences on the trademark reputation of the undertaking [D], associated with luxury, offering rare and unique models, thus damaging its commercial reputation, aggravated by the marketing and communication campaign orchestrated by the appellants to follow it. However, the damage caused must be put into perspective in the light of

the actions, which were limited in time and which, according to [D]'s findings, only related to nine items marketed by ZARA and which were the subject of two editorials placed in the online environment at the same time. The appreciation of all these elements, in addition to the figures already mentioned, cannot, therefore, lead the appellants to denounce an arbitrary assessment disconnected from any objective financial reality. Therefore, the position of the commercial court must be considered when it recognized that the parasitic actions of the respondent companies caused moral damage to the undertaking [D], which was rightly assessed at €200,000."

In the case of *Monoprix vs. Galec* [CA Paris, ch. 5-2, April 15, 2022, RG 20/15209], we find the analysis of the defamatory campaign carried out by the author of the harmful act: "On the moral damage caused to the reputation by means of the advertising campaign presenting the Monoprix company by a pigeon (which lasted from September 4-24, 2018 and was limited to territorial (geographical) zone of the city of Paris). In this context, the position of the first judges must be approved who, in the justification of their decision, set the amount of moral damage suffered by the Monoprix undertaking at the amount of 100,000 euros (...)"

In order to be fairly compensated, it is therefore necessary to avoid that the damage caused to someone's reputation also suffers this tendency to "forfeit" the amount of moral damage, as mentioned by Professor Catherine Prieto [Prieto, p. 106], as a kind of "compensation, or even a second solution, for an insufficient assessment of the economic damage". Even when placed at the center of a broader moral reparation, reputational damage retains its specificity.

From another perspective, in the relevant French jurisprudence it is shown that the object of an action in unfair and parasitic competition is most often twofold: (i) on the one hand, an order to stop the infringement is requested and, (ii) on the other party, compensations are requested, regardless of their nature (economic or moral). In this sense, the French Court of Cassation has established a presumption by virtue of which the inevitable existence of a damage, even if only moral, following the commission of an act of unfair competition is deduced (Cour de cassation, civil, Chambre civile 1, 21 March 2018, 17-14.582, Unpublished [Cour de cassation, civile, Chambre civile 1, 21 mars 2018, 17-14.582, Inédit]).

Current framework in the Republic of Moldova

Referring that principle to the specifics of the legislation in force of the Republic of Moldova, it has been sustained that the damage is a *sine qua non* condition only for the civil liability for unfair competition actions [Gorincioi, p. 139]. For that reason, we disagree with the given presumption, in the context in which the damage is a mandatory element only in the case of tortious civil liability applicable for unfair competition actions, while in the case of administrative liability and criminal liability for unfair competition actions, the damage is an optional element, due to the formality of most unfair competition actions enshrined in the text

of Law on competition no. 183 of 11.07.2012 and the forms of expression of unfair competition crime through the provisions of the Criminal Code of the Republic of Moldova.

Contextually, we will illustrate five distinct situations corresponding to the five types of unfair competition actions in order to confirm the hypothesis of the lack of obligation of the existence of damage following the commission of the respective unfair competition actions.

Illustration 1. Undertaking X spreads certain disparaging false information about a competing product of undertaking Y within a certain group of loyal consumers. Those consumers, for reasons of knowledge of the fact that the given statements are false, did not undertake any migration action against the competitor who was author of the defamation action. Therefore, there is no patrimonial damage caused in that situation. However, a possible moral damage can be discussed. But, for the same reasons of knowledge of the actual state of affairs, Y was not affected in any way. It is obvious that in the case of tortious civil liability, the causing of damage (whether patrimonial, moral or granted in connection with the loss of chance) constitutes a mandatory aspect in the sense of applying this type of liability. However, Competition Law no. 183 of 11.07.2012, which provides for administrative liability for discrediting competitors, uses terms and phrases such as "endangering" or "intended," a fact that gives a formal character to the unfair competition action in question, the mere commission of the unfair competition action of discrediting competitors being sufficient in the sense of applying administrative liability for such a violation. Moreover, the provisions of art. 10 bis point 3 sbpct. 2 of the Paris Convention on the Protection of Industrial Property of 20.03.1883 provides that "false statements, in the exercise of trade, which are likely to discredit the enterprise, products or industrial or commercial activity of a competitor" are prohibited.

Illustration 2. Undertaking X instigated a good part of the clientele of undertaking Y to terminate their contracts with the latter by offering certain pecuniary advantages to the concerned clients. For reasons independent of the will of the instigating subject, the clientele of undertaking Y did not react in any way to the respective actions of instigation. Therefore, the damage did not occur. Accordingly, in the case, only administrative liability can be applied for the unfair competition action of instigating the termination of the contract with the competitor.

Illustration 3. Undertaking X has illegally obtained the trade secret of competitor Y but does not use the information in any way. Accordingly, it does not cause damage to undertaking Y. Theoretically, it can be discussed with reference to causing a possible moral damage, but not using the trade secret obtained illegally most of the time "can harm the legitimate interests of the competitor". Accordingly, in such situations there is only the risk of affecting the legitimate interests of the competitor at the expense of which the trade secret was obtained, and the damage would occur only in the case of a possible aggravated form of the respective unfair competition action, manifested through its use.

Illustration 4. Undertaking X carries out certain actions to mislead the clientele of competing undertaking Y regarding the place of manufacture of a certain product in order to

attract them. For reasons independent of the will of X, however, the consumer does not migrate to the author of the misleading actions. Accordingly, the damage does not occur. Such actions are likely to mislead consumers, but they do not actually mislead the clientele of undertaking Y. Such an approach is also consistent with the provisions of art. 10 bis point 3 sbpct. 3 of the Paris Convention for the Protection of Industrial Property, provisions according to which there are prohibited indications or statements the use of which, in the course of trade, is likely to mislead the public as to the nature, method of manufacture, characteristics, fitness for use or quantity of the goods."

illustration 5. Undertaking X illegally uses partially the industrial design belonging to undertaking Y by placing the former's product on the domestic market. Those actions are likely to create confusion in consumers' perception of undertaking Y and the latter's products. For reasons beyond the control of the two undertakings, however, consumers distinguish between the products in question and remain loyal to undertaking Y and the products placed on the market by it. Accordingly, the confusion is not actually produced. Thus, due to the formal nature of the actions of undertaking X, the damage does not occur.

Contextually, in the recent jurisprudence of France, through a decision of the Court of Cassation of the respective state from 12.02.2020, the following aspects were observed: "When the harmful effects, from the point of view of economic disruption, of acts of unfair competition are particularly difficult to quantify, which is the case of those that consist in the interference with the efforts and investments, intellectual, material or promotional of a competitor...all the acts that, by allowing the author of the practices to absolve himself of an expense that is , in principle, mandatory and grants a competitive advantage to the latter, it must be accepted that the damage can be assessed taking into account the unjustified advantage obtained by the author of the acts of unfair competition at the expense of his competitors, modulated in proportion to the volumes of the respective businesses of the parties affected by such actions." [Cour de cassation, civile, Chambre commerciale, 12 février 2020, 17-31.614, Publié au bulletin]

Therefore, the decision of the court must be approved to the extent to which, when called upon to rule on compensation for damages resulting from a commercial practice misleading the consumer, giving its author an unfair competitive advantage over his competitors, takes into account, in order to evaluate the compensation to be allocated to the given competitors, of the savings unjustifiably achieved by him, which he modulated by taking into account the respective business volumes of the parties affected by the said actions.

The national legal basis for awarding compensation. Although a non-existent practice was found in terms of granting compensation for unfair competition actions, the legal basis for granting such compensation can be found even in the Competition Law no. 183 of 11.07.2012. Thus, according to the provisions of art. 80 para. (1) of the specified normative act, "The court shall oblige the person who commits an unfair competition action to cease the action

or remove the consequences, to return the confidential documents illegally appropriated from their legitimate holder and, as the case may be, to pay compensation for the damages caused, according to the legislation in force".

In the same sense, art. 80 para. (3) of the aforementioned normative act provides: "If any of the unfair competition actions cause patrimonial or moral damages, the injured party has the right to address the competent court with an appropriate civil liability action."

At the same time, in accordance with the provisions of art. 77 para. (2) from the same normative act, "The damage caused as a result of actions found to be unfair competition is to be repaired, in accordance with the provisions of the Civil Code, by the company that caused it".

Although apparently repetitive, we believe that the above-mentioned rules apply in different contexts. Thus, (i) the provisions of art. 80 of the Competition Law no. 183 of 11.07.2012 are applicable in the case of tortious civil liability for unfair competition actions, and (ii) the provisions of art. 77 para. (2) are applicable if the actions of unfair competition were ascertained by means of the administrative act of the Competition Council (decision of the Plenary of the Competition Council).

Therefore, the relevant legislation allows the aggrieved subject to request the granting of patrimonial and/or moral damages for the unfair competition action of its competitor.

Criteria for awarding damages for unfair competition actions

In the domestic doctrine, it was proposed as a recommendation to consider the following criteria in the sense of quantifying the damage caused by unfair competition actions: (i) The difference between the undertaking's income before the occurrence of the unfair competition action and the income after its occurrence (lost income); (ii) Reflecting the unfair competition action on turnover; (iii) The nature and severity of the damage; (iv) Bad faith of the competitor who resorted to unfair practices; (v) Duration of the unfair competition action; (vi) Adverse economic consequences; (vii) Undue benefits obtained by the author of the unfair competition action; (viii) The impact of the unfair competition action on consumers and loyal customers; (ix) The expenses incurred by the claimant to restore his situation in accordance with the one prior to the occurrence of the injury; (x) Causing moral damage; (xi) Deteriorating the competitor's reputation/image; (xii) Degree of confusion and misleading to consumers" [Castraveț, p. 133]

We consider that such an enumeration of the possible criteria for assessing the damage caused is generic and not adapted to the categories of damage that can be collected as a result of the finding of unfair competition actions.

Thus, from all those proposed, we retain the following possible criteria (factors) for assessing the damage (which influence the way in which the damage is assessed): (i) the duration and severity of the violation; (ii) the attitude of the unfair competitor in relation to the violation committed; (iii) the impact on consumers and clientele; (iv) the value of the object of

attack: (v) causing mental suffering to the passive subject of the unfair competition actions; (v) damage to the reputation and/or credibility of the damaged competitor; (vi) the proportions of the advantage not obtained by the rights holder by missing the chance; (vii) the importance of the missed opportunity for the injured rights holder.

Given the fact of interdependence between the various types of damage likely to be caused through unfair competition actions, we believe that the criteria (factors) that can influence the amount of damage can be addressed interchangeably. In other words, the mutual impact between the different criteria for quantifying patrimonial, moral or loss of opportunity damages cannot be excluded.

In the same context, the solutions offered by the national legislation in this regard should also be mentioned. Thus, in the case of moral damage, according to the provisions of art. 2037 para. (1) of the Civil Code of the Republic of Moldova, "The amount of compensation for moral damage is determined by the court depending on the nature and severity of the moral damage caused to the injured person, the degree of guilt of the perpetrator of the damage, if guilt is a condition of liability, and the extent to which this compensation can bring fair satisfaction to the injured person.". Therefore, the civil legislation indicates the following criteria for variation in the amount of moral damage awarded: (i) the nature and severity of the moral damage caused to the injured person; (ii) the degree of guilt of the author of the damage; (iii) whether guilt is a condition of liability; (iv) the extent to which such compensation can bring just satisfaction to the injured person. Thus, it can be inferred the fact that the civil legislation does not offer a comprehensive set of criteria for the purpose of quantifying moral damages, considering the fact that the configuration and the structure of unfair competition actions and their consequences are much more diverse and should be approached globally.

Varieties of damage in the context of private unfair competition actions.
Discrediting competitors. (i) As regards the assessment of damages for the harm caused as a result of discrediting competitors, the following criteria could be considered: (i) the expenses incurred by the injured party in order to restore the previous situation (for example, in the case of direct discrediting, there could be necessary expenses to restore the reputation of the product that was the object of discredit in terms of combating false statements spread by the unfair competitor in the process of economic activity - additional advertising, additional marketing actions; in the event of indirect discredit, the affected competitor/competitors could bear expenses for the purpose of recovery the reputational situation generated by the same unplanned additional investments in advertising and marketing activity); (ii) the lost profit (for example, in the case of direct discrediting, it would be necessary to recover the income made by the defamatory undertaking as a result of the migration of the clientele from the discredited competitor to the denigrating one and in the case of indirect discrediting, as a result of the migration of the clientele to the undertaking that launched the false information about their own activity and/or products from their competitor(s); (iii) regarding the duration and severity of the

violation, it is normal that the amount of compensation should be proportional to the time interval in which the discrediting information was accessible to the public and depending on the susceptibility of the rapid remedy of the generated situation; in other words, the size of the damage must increase proportionally to the increase of the accessibility period and the increase of the severity of the discrediting false information; (iv) in the situation where the dissemination of false information was done in bad faith, the proportions of the damage must increase accordingly. On the contrary, if no bad faith is found in the conduct of the active subject of the discredit, the proportions of the damage are likely to decrease; (v) depending on whether the consumer/clientele reorients and migrates massively or not as a result of the discrediting actions, the damage is variable. Thus, if the migration is massive, the damage increases accordingly, and in the case of an insignificant migration - the damage decreases proportionally; (vi) contextually, the damage is likely to decrease or become a considerable one depending on whether the value of the object of attack is reduced or increased.

Thus, for example, in the situation where the discrediting information refers to a single product, the prejudicial degree of the act is much lower than it would be if the information was attributed to a wide range of products marketed under the same trademark; (vii) the amount of damage for mental suffering caused to the discredited person varies depending on the importance of the business for the passive subject of the discrediting action, and the importance of the business may vary depending on the investments made in its development. Thus, the amount of the moral damage will be likely to vary depending on whether the founder/manager of the enterprise has made considerable investments in the development of the business; (viii) as regards damage to the company's reputation, we note that this is an inherent aspect of defamation and can be achieved immediately by recourse to the respective unfair competition action. The evaluation of the amount of such damage is possible by determining the degree of decrease of the RQ index (Reputation Quotient) which is estimated by means of sociological methods (questionnaire evaluation); (ix) additionally, in case in which it was expected to conclude a series of contracts with certain suppliers or consumers that would have generated considerable income and this fact was not realized due to the consideration of the defamation action, the proportions of the quantified damages are likely to increase (x) the importance of the missed opportunity is probably the most subjective criterion for evaluating the damage, or this (the importance of the missed opportunity for the damaged undertaking), unlike the proportions of the missed opportunity, can result from certain internal aspects of the company at the level of goals, objectives, ideas of the administrative system and there is little probability of disclosing such kind of information to the court, even with the risk of not granting the appropriate compensations.

Instigating the termination of the contract with the competitor. (i) Regarding the assessment of the damage resulting from the instigation to the termination of the contract or the non-execution/improper execution of the contractual obligations in relation to the competitor of

the instigating undertaking, the following findings can be inferred: (i) the proportions of the awarded compensation is likely to increase simultaneously with the increase of the interval of time of instigation to the respective facts and with the proportions of the losses borne by the passive subject of the instigation (for example, in the case of instigation to the non-execution of contractual obligations in relation to the competing undertaking, the size of the damage can increase depending on the time period within which the given obligations were not executed and depending on the amount of unexecuted obligations); (ii) regarding the attitude of the unfair competitor in relation to the committed act, in the case of the instigation to terminate the contract with the competitor, the existence of bad faith cannot be questioned, but rather the degree of its manifestation. However, the degree of bad faith is to be determined according to the length of time and the value of the contract object of the instigation. Respectively, the degree of bad faith is determined depending on the criterion addressed above. So, it is not an independent criterion, but a subordinate one; (iii) with regard to the impact on the consumer/customer, we specify that the susceptibility of using this criterion to assess the damage is carried out according to the dimensions of the instigating action (for example, in the hypothesis that the undertaking X realises instigating actions of the clientele of undertaking Y in full, the damage is to be quantified on a higher scale in relation to the situation in which undertaking X carries out actions to instigate a specific customer or a group of customers of undertaking Y); (iv) depending on the revenues achieved by the victim undertaking of the unfair competition action in the context of the development of contractual relations with the instigated clientele, the proportions of the damage caused may also vary; (v) in the case of instigating to the termination of the contract with the competitor, the diminishment of the undertaking's reputation may constitute a mediated effect of the instigating action to the extent that the instigator spreads certain false information among consumers in the context of the unfair competition action addressed. Therefore, the susceptibility of causing moral damage by diminishing the undertaking's reputation is dependent on the fact of the existence of defamatory actions within the instigation to terminate the contract with the competitor; (vi) if the undertaking against which the instigation was committed obtained or was likely to obtain considerable income in the context of the respective contractual relationship, the latter is liable to be damaged by losing the chance to obtain or continue to obtain the considerable income from the respective client; (vii) the importance of the chance, again, may result from the internal strategy of the enterprise against which the instigation has been committed.

Illegal obtaining and/or use of competitor's trade secret. (i) The size of the patrimonial damage caused by obtaining and/or illegal use of the competitor's trade secret varies depending on the duration of the illegal use of the competitor's trade secret and depending on the income obtained specifically in the context of the use of the trade secret in question; (ii) it is obvious that in the majority of cases, obtaining and/or illegally using the competitor's trade secret will be done in bad faith, or to the extent that the illegal competitor

knows about the origin or how is used a trade secret (illegally), there can be no question of an attitude of good faith. However, in some situations, it is possible that the illegal user of the trade secret is not actually aware of the secret nature of the trade information in question and, respectively, is not aware of the fact that he is using it illegally; (iii) the impact on the consumer in case of obtaining and/or using the competitor's trade secret can be estimated by the degree of reorientation of the clientele from the owner undertaking to the undertaking that illegally obtained and/or uses the owner undertakings's trade secret. Respectively, the situation of a massive reorientation will generate greater damage for the latter; (iv) depending on the circumstances in which the trade secret is used (its destination), the size of the damage is also likely to vary. Thus, for example, in the situation where the trade secret is used to produce a range of products under a certain nationally or internationally renowned trademark, the amount of compensation can increase significantly; (v) diminishing the reputation of the undertaking to the detriment of which the trade secret is illegally obtained and/or used may result from how the respective trade secret is used by the unfair competitor. Thus, by way of example, in the case of the use of trade secrets in a context in which the image of the affected undertakings's products is damaged, the amount of compensation is likely to increase.

Misleading of the competitor's customers. (i) Regarding the duration of the infringement, to determine the amount of damage caused, the period of time during which the competitor's clientele was misled will be taken into account. Under the aspect of the seriousness of the violation, we specify the need to determine the extent to which the consumer was misled regarding the product of the misappropriating undertaking; (ii) under the aspect of the attitude shown by the misleading undertaking, we specify that both good faith and bad faith are possible. Depending on whether the author of the unfair competition action of misappropriation of the competitor's clientele was in good faith or in bad faith, the damage will be assessed accordingly; (iii) the damage will be determined in terms of the impact of the unfair competition action on the consumers to the extent that the latter were induced to migrate from one undertaking to another as a result of misleading actions; (iv) depending on the degree of determination of the clientele (the intensity aspect) of migration from one undertaking to another, the damage is likely to vary in the direction of growth in the case of a more intensive migration of the clientele; (v) the damage to the reputation of the competitor's undertaking is indirect in the case of diverting the competitor's clientele, or the extent to which the reputation is damaged depends on no. of customers migrating from the affected undertaking to the one carrying out the illegal actions; (vi) the amount of the damage increases proportionally to the increase in the size of the lost opportunity, or, for example, in the event of contracting some important customers, the affected undertaking loses that opportunity and, likewise, the corresponding compensations are likely to be requested; (vii) the importance of the lost opportunity, again, depends on the strategic vision of the undertaking and the respective objectives that correspond to certain real opportunities.

Confusion. Probably, the method of assessing the damage in the case of confusion constitutes an increased degree of complexity on the grounds that the object of attack will always be an object of industrial property or advertising belonging to the competitor. Thus, (i) regarding the duration of the infringement, in order to determine the amount of the damage caused, the period of time during which the product in question was placed on the market will be taken into account; in the case of confusion in the online domain, the time frame in which the term has been used that directly creates confusion among consumers will be taken into account; (ii) under the aspect of the attitude shown by the undertaking that creates confusion among consumers, we specify that in most cases, the respective attitude is one of bad faith considering that the undertaking that creates confusion is aware of the fact that it is taking over the industrial activity of the competing undertaking. However, there are situations in which the unfair competitor does not know about the existence of a protected or unprotected object of industrial property of another undertaking; (iii) the damage will be estimated in terms of the impact of the unfair competition action on consumers to the extent that the latter were induced to migrate from one undertaking to another as a result of the actions generating confusion among them; (iv) depending on the value of the object of attack (the value of the trademark, the resonance of the firm name), the damage proportions will be liable to vary accordingly; (v) in case of confusion, every time there will be a risk of affecting the reputation of the undertaking to the detriment of which the confusion is realised to the extent that the object of protection has a significant value; (vi) the value dimensions of any contracts that could be concluded will be taken into account; (vii) the undertaking's internal strategy will be taken into account regarding its further development.

Conclusions

Following the investigation of the subject under discussion, there should be revealed the following aspects: (i) it was determined that the damage to the undertaking's reputation through unfair competition actions constitutes a distinct side in relation to the violation of industrial property rights, as well as in relation to causing moral damage to the undertaking in the context of the assessment of the respective damage, although it is considerably closer to the latter, considering the addressed jurisprudence; (ii) by reference to the system of unfair competition actions established by means of Competition Law no. 183 of 11.07.2012, reputational damage is an archetypal hypothesis, considering the operating mechanism of actions contrary to the law and honest customs in the economic activity of undertakings; (iii) there is attested the existence of a quantitatively limited spectrum of the criteria for assessing the damage resulting from the harm caused to the undertaking's reputation in the context of unfair competition, as well as a relatively distinct configuration of the manifestation of the respective criteria, depending on the concrete type of the action unfair competition.

In the sense of the above mentioned facts, we conclude on the examined subject by highlighting the following: (i) Although there is a practically non-existent jurisprudence in the judicial practice of the Republic of Moldova regarding the granting of possible compensation (regardless of the type of damage suffered) to the victim undertaking the actions of unfair competition, the legal framework is sufficiently well defined in this regard; (ii) in France, where the normative regime regarding the granting of compensation for the economic damage caused is developed in the methodological benchmarks nominated in this work and in the rigorous jurisprudence, there does not exist a totally unified approach regarding the addressed aspect; (iii) At a prospective level, there should be considered the opportunity to implement the possibilities conferred by law on the victims of unfair competition actions in order to obtain the appropriate compensations as a result of affecting their rights and legitimate interests in the context of unfair competition.

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MULTINATIONAL COMPANIES FOR BUSINESS INTERNATIONALIZATION THROUGH FOREIGN DIRECT INVESTMENT (FDI) IN GLOBALIZATION: TRENDS FOR VALUES

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Abstract: *This paper analyzes and describes multinational companies as a business internationalization strategy through foreign direct investments (FDIs) for business internationalization to reach business values in the frames of globalization. The analysis and results demonstrated that Multinational companies (MNCs) and foreign direct investments (FDIs) may face challenges and risks in new locations due to economic and political instability, difficulties of infrastructure, distrust in the locations, locations, difficulties of balance in payment, challenging negotiations in business agreements and quality contracts, borders and transportation challenges, challenging in the market size. Multinational companies that go for foreign direct investment have an economic impact and can affect a country's economy in various ways, for example, in the balance of payments, in growth rates and in job creation. The effect of foreign direct investment by multinational companies can be negative or positive depending on certain factors. A multinational company's pattern of internationalization represents different factors of possibilities, costs, risks and difficulties faced during its internationalization. In conclusions, Foreign direct investment (FDI) is an important step towards business internationalization and if the domestic company decides to go multinational towards FDI, it has to consider the factors of ownership, location and internalization to reach business internationalization as confirmed in Dunning's framework and this analysis.*

Keywords: *multinational companies (MNCs). Business internationalization, process, foreign direct investment (FDI), globalization, trends, values.*

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Introduction

In a globalized economy, the law of mobility of productive factors is part of the economic reality of countries. Companies and business holders that invest to enter new markets may face the entry mode challenging aspect to enter some economies and some of the challenges may lead to controversial situations and could be even difficult to control and that may lead to possible financial crises. Currently, it must be kept in mind that companies want to control their foreign operations in such a way that they can achieve their objectives in an environment that

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guarantees their investments. In other words, where the risk is minimal. Thus, the capital could be the resource with the greatest mobility at the international level.

Companies that invest indirectly or directly in new facilities to produce or market or to do both in a foreign country may become multinational companies. In other words, when a foreign company enters a country and begins to produce, this is already a foreign direct investment regardless of whether what it produces or sells in that country or others where it is located or if it exports to the country of origin or to any other country in the world. With the fact that the foreign company produces, markets or carries out operations in a foreign location, it already makes a foreign direct investment. However, according to Cuervo-Cazurra (2014) the multinational company has a series of benefits for the country of destination. In many countries or economies the ability to compete in business or what we may call competitiveness of national firms is getting more a government rather than just a private concern, in particular of course where state-owned companies are getting involved (Cuervo-Cazurra et al., 2014).

Globalization and internationalization are two separate phenomena but they complete each other. As various markets are under the dimensions and reflections of globalization, they are connected to and in globalization. Business internationalization is the process of increasing and internationalizing businesses and companies in foreign markets and new locations abroad, it appeared in globalization that removed boundaries between countries and globalized the world of markets and economies by coming up with digitalization and virtual platforms. Within the dimensions of globalization domestic; companies try and decide to leave the domestic market and go multinational to increase their competitiveness and profit. Both multinational companies and foreign direct investments may face challenges and restrictions since the process of internationalization is not easy. Multinational companies (MNCs) take over their foreign direct investments (FDIs) simply in order to boost their effectiveness and performance. Back to history, the main view on MNEs' international strategy has been that they do business globally (Levitt, 1983) and (Friedman, 2005).

This paper presents an agenda and an extension of of the PhD research regarding the importance of business internationalization and the internationalization of multinational companies through the process of FDI that is one of the most important internationalization processes and entry modes, the paper presents and analyzes an extension to the theory and aspects of the multinational company (MNC). As over the past decades some aspects or insights of International Business have been thoroughly studied such as the market entry decision (Dunning, 1977; Buckley & Casson, 1998b) and the subsidiaries' relevance and role. (Rugman & Verbeke, 2001) and of course the location of headquarters (Menz, Kunisch & Collis, 2015) Whereas other aspects such as the challenges that may face both multinational companies (FDIs) and foreign direct investments (FDIs) and the impact on headquarters or the countries of destinations or foreign locations and markets have received relatively little attention. As theoretical framework has to be extended there is a need to focus on and explore these areas more thoroughly.

The aim of this study is to develop a systematic analysis and research about the importance and relevance of multinational companies that are one of the main strategies of business internationalization through the process of foreign direct investment (FDI) in globalization and how it is relevant for multinational companies to go for FDI, the paper as well focuses on the relevance of foreign direct investments (FDIs) to multinational companies (MNCs) and business internationalization by figuring out some of the challenging aspects that could face in the new locations that could be positive or negative for multinational companies that take over FDI in considered economies or countries of destination, new foreign markets or just in the new potential locations abroad for values and business internationalization processes.

Related literature

Background of Globalization

Globalization is one of the most important processes of modern society (Robertson and White, 2007). In addition to globalization, the transition is an important process, in particular for developing countries. (Mrak, 2000). Globalization is a spontaneous, uncontrolled process of increasingly intensive integration of countries into a single economic system (Mittelman, 2000, Robertson and White, 2007). Globalization may increase the possibility of economic growth in each country through international trade and increases in foreign direct investment (FDI). Economies strongly incorporated in globalization could expect more investment, foreign trade, and higher growth rates (Dimitrijević, 2016). The main assumption for that is early inclusion in globalization processes. Globalization increases capital flows, labour productivity and citizens' living standards. With globalization processes, one can expect a more efficient allocation of savings (Dimitrijević, 2016).

Globalization has gradually shaped the world for ages and it has undoubtedly been accompanied by various waves of industrialization. It moved the world and human society from simple energy resources such coal and wood to fossil fuels for industry as sources of energy and to sustainable energy and business, step by step it globalized the energy market, every step is accompanied by energy consumption, so the intensive use of energy has become fundamental in economy. (Benabed and Boeru, 2023). Globalization has, for instance, facilitated the dissemination of technology and information, thereby generating new opportunities for innovation and development, emphasizing that the 4th and 5th industrial revolutions are evidence of it. In addition, it has led to concerns regarding privacy and security, as well as the possibility of job displacement and inequality. (Benabed and Boeru, 2023).

The labour market has known changes but the challenges after the start of the pandemic and the recent international geopolitical instability that has overwhelmed both emerging and advanced economies because the Crisis of Covid-19 could lead a part of qualified workers to leave their jobs or return under different conditions and high cost of leaving the thing that

makes wages weaker in contrast with the rising rate of inflation in such situations that happen occasionally (Benabed et al., 2023). On the other hand, it is highly difficult to match all the labour supplies and demands because an occurring inflation impact the supply chain as well. (Benabed et al., 2023). Global economic growth prospects are facing ups and downs, the rise of interest rates to contain inflation, especially after the lingering effects of the pandemic and supply chain disruptions, recession and geopolitical tensions are obstacles for the world economy. (Benabed and Bulgaru, 2023) this could be important for multinational companies to have various locations to save its business in times of crisis.

Globalization and foreign direct investment (FDI)

According to Lagendijk and Hendriks (2009) in their chapter foreign direct investments (FDIs) are the predominant or widespread mode and process of corporate governance to reach control over productive assets in foreign locations abroad. The control could be attained through the transfer of property rights to the foreign company. Through foreign direct investment (FDI), companies can exploit and use their internal abilities as they are called the ownership advantages by combining them with location-specific advantages abroad such as local value chains, market opportunities and resources. On the other hand according to Lagendijk and Hendriks (2009) the aim of FDI is to boost and improve ownership-specific advantages by settling in foreign technological hotspots. The choice for governance's mode depends on the aspect and criteria of internalization advantages, that could be, the advantage of an acquisition solution versus the contractual network solution. (Lagendijk and Hendriks, 2009).

Globalization and the progress of traditional political backgrounds have changed the influence and interaction between companies and stakeholders (Roy and Quazi, 2022). The expectations and pressures of stakeholders and institutions' influence count on the communication strategies adopted by companies that have become proactive (Dressler and Paunovic, 2021) and are based on the country's level of development in terms of social and economic aspects (Tosun, 2022).

FDI net inflows occur when in the reporting country or economy non resident investors make amounts and values of ingoing direct investments towards the inside.(World Bank, 2024). However, FDI net outflows occur when in the residents of a reporting economy make amounts and values of outgoing direct investments to external economies. (World Bank, 2024).

Business internationalization and multinational companies (MNCs)

According to Welch and Luostarinen (1988) internationalization in business means the process of business activities across home country borders with an rising level or degree in operations. (Welch and Luostarinen, 1988). While Fayerweather (1978) identifies the international business activity as the activity that implies and involves the exchange of resources across national borders (Fayerweather, 1978). Back to the 1966s the

internationalization process according to Aharoni (1966) is traditionally perceived as a result of a gradual adjustment to changing and challenging conditions within the company and its environment (Aharoni, 1966).

Vahlne and Ivarsson, 2014 states that some prior literature has already identified a positive link between a Multinational companies' prior internationalization in a country's region and its subsequent internationalization in that country by identifying the regional integration effect, (Vahlne and Ivarsson, 2014). Mainly, theories such as the Uppsala model, internalization theory or the Penrosean approach explain how a multinational company's existing internationalization patterns influence the complexity of managing international operations and the accumulation of knowledge that can be used across countries (Johanson and Vahlne, 1977). In addition, other areas of strategy have recognized that a firm's prior strategic experiences impact future strategic actions (Mayer et al., 2015).

A multinational company is a company that operates in several countries where it may have factories, offices or points of sale and normally there is a country where it begins operations, thus, we can call that company a parent company and the rest of the countries where the multinational has been established and extended over time will be called subsidiaries. (Benabed, 2023). Internationalization strategies are a system that is used to plan and implement actions that are aimed at fulfilling and positioning a company in the international market. (Benabed, 2023).

Internationalization allows companies to achieve at least a competitive advantage to increase their presence in the international market, therefore it is important that they are well designed and since based on this the company will be able to enter new markets to increase value or profit, the number of your customers and your sales. Through internationalization, the company can introduce products or services to other countries that do not yet have them or do not have them. (Benabed, 2023). Multinational companies have got various characteristics and implications for business values and no matter their size small, medium or large they need to focus on the aspects of sustainability and digital opportunities to reach the clients' satisfaction and be close to them. (Benabed, 2023).

Internationalization enables family firms to exploit growth opportunities, reach new clients and markets, provide succeeding generations with employment opportunities, and contribute to increased performance (Arregle et al., 2012).

Methodology and research questions

The research methodology focused on a related literature review to the research topic and a relevant descriptive analysis. The analysis and result area went through data collection and interpretation according to their availability and relevance from the mentioned sources, by analyzing as well the Dunning paradigm of Dunning that is called also the OLI model to demonstrate if the move of multinational companies towards business internationalization

through FDI is possible according to the Eclectic Paradigm by Dunning (1988). (See figure 1) and to bring its aspects to this paper and simply to check the relevance of FDI for multinational companies and business internationalization by applying it to this research. (See figure 1). The research method focused as well on illustrating the collected data in graphics and figures (See figures 4, 5 and 6) and by coming up with two relevant frameworks about the possible challenging factors for foreign direct investment (FDI) and multinational companies (MNCs) (See figure 2) and the importance of FDI for business internationalization and new locations (See figure 3) as illustrations for the analysis and result section. In order to make a connection between the analysis and application of the OLI paradigm in the research, the framework and model in figure 7 was created to illustrate the main suggested steps for business internationalization with FDI and other companies' operations (with a focus on the multinational strategy). (See figure 7). Thus, the OLI model is connected with the framework of figure 7 to reach successfully business internationalization.

Mainly, writing the part of scientific literature review started with a clear understanding of its importance and role for this full paper by focusin on the context where this research fit into the body of knowledge and by Identifying the key concepts and variables such as the process and importance of business internationalization and its key strategies, a brief background of globalization, multinational companies (MNCs), foreign direct investments (FDIs) that apply in this area of research. Then, Identifying the relationships between these concepts and the other ones provided in the content of literature could help structure all the literature section based on prior research conducted by other authors in the same area of the main mentioned concepts. Different databases were used to conduct the research review with exhaustive reading with a focus on seeking the suitable prior literature for this paper.

The literature review was followed by a descriptive analysis that based on data interpretation and analysis according to the illustration of the available data in the created figures that are showed in the part of analysis and results and by creating two frameworks that illustrate some ideas and results (See figures 2 and 3). Identifying the research questions could help out as a guide to focus on the topic, the research is neither overgeneralized nor stringent.

The set research questions are that helped go further with analysis and research are:

RQ1: How important and relevant are FDIs for the multinational companies and Business internationalization?

RQ2: What challenges are there for both multinational companies and foreign direct investments during the internationalization process?

In general, it is not easy to draw the line between the analysis and Interpretation since both parts and processes are merged imperceptibly, the interpretation and analysis of data were inextricably intertwined.

Analysis and Results

Companies have different internationalization insights, levels, experience and scope that may help them overcome the barriers and constraints of markets to focus on their needs and goals while entering other markets.

The relevance of the OLI model to Multinational Companies and Business internationalization

Chen (2020) states that an eclectic paradigm, or as it is called the OLI model that bases on the ownership, location, internalization of a firm and it is a three-tiered evaluation framework that companies may use and to check and find out if it is beneficial for them to go for foreign direct investments (FDIs). This paradigm is based on It is based on internalization theory that was first expounded upon in 1979 by John H. Dunning.that assumes and make sure that institutions may avoid transactions in the open market if the cost of completing the same actions internally carries a lower price. (Chen, 2020).

Dunning's eclectic paradigm or as it is called as well the Dunning's OLI model is a high-level evaluation framework that companies can follow when they attempt to determine their benefits or realize extraneous inversion. The company must place proper sales at the time of participation in external markets to secure a position of sale. This theory of Dunning was first published in 1979 by John Dunning when industries and businesses adapt to the environment and elect strategies to survive and grow a long way. The object of the paradigm is to help find a possibility for internationalization to involve companies involved in international operations. (See figure 1).

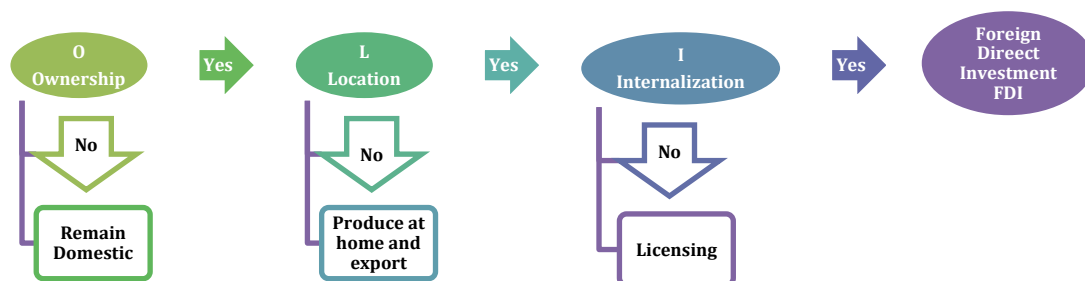


Figure 1. The move of multinational companies towards business internationalization through FDI

Source: Author's design and contribution, 2023, Adapted from the Eclectic Paradigm by Dunning (1988)

By looking at the framework in figure 1 that is a considered a business model, if the company decides to transform from domestic to multinational, it may consider going for foreign direct investments. By considering the three main factors of the OLI paradigm. If the

company has a strong ownership that could be something to compete with in foreign markets, it may look for suitable locations abroad and if it finds the right location, it may go multinational through the internalization process and move for foreign direct investments. Whereas, if the company does not believe that its ownership is enough to compete with abroad for values and competitive advantage, it may remain domestic and exercise the same activities in the home country. If the company has a strong ownership but the location factor is not satisfied, the company may consider to actually export from the home country into the target markets. However, if both ownership and location are satisfied but the internalization factor is not, the company may go for licensing, franchising or probably outsourcing abroad as other options. So business internationalization is a key factor to move and transform domestic companies to multinational companies through various options from which foreign direct investment (FDI) could be a relevant option and business internationalization process towards values and business leadership. (See figure 1).

The main keys of foreign direct investment (FDI) for Business Internationalization

Foreign direct investment can occur in two forms:

a) Investments in new facilities: the establishment of a new operation entirely in a foreign country.

b) Acquisitions with the existing companies in the country means the acquisition of a local company and when a local company is purchased, the multinational company does not have to start from scratch because it buys a company that is already operating, billing and has a client portfolio which probably has an established distribution channel already known with the banks of the destination country.

Starting from scratch is when the company arrives in the country and builds its premises, its offices and hires employees from the first collaborator, but the path of acquisitions is different again because a company that is already operating is purchased. In addition to this.

c) Mergers: there is a process or an alternative possibility of foreign direct investment that exists and that occurs more and more often in the world market, it is process of mergers and this occurs when two companies that have practically the same economic power in any commercial case can combine their forces and become a larger company, this is very important especially to enter countries that are more commercially demanding and when it comes to larger markets where the company can face rival competitive companies, much larger and economically powerful companies with a budget of marketing.

The flow of foreign direct investments and the impact of multinational companies

The flow of foreign direct investment refers to the amount of foreign direct investment made in a given period of time and this point is constantly measured worldwide in order to analyze trends to where the foreign direct investment is flowing more towards modern or developed countries or to emerging or developing countries. When foreign direct investment worldwide falls, it can be said that because it is subject to the confidence that investors have in private companies that follow what is happening in the world economy or the economic cycle to enter or withdraw from investments. The level of foreign direct investments falls when financial tights of energy companies appear, for example, financial accounting fraud, conflicts of interest, geopolitical conflicts, the location of companies in areas of natural disasters.

Multinational companies that make foreign direct investment have an economic impact and can affect a country's economy in various ways, for example, in the balance of payments, in growth rates and in job creation. The effect of foreign direct investment by multinational companies can be negative or positive depending on certain factors. If a company moves its production, factory and technology to another country, those who work in similar factories in their country may be laid off due to the greater competition that the multinational company can bring to that country or those countries. So, with respect to employment, the country of origin may be hit hard, although it will not be so negative, but it may generate unemployment. On the other hand, when the company moves its production from a developed country to a developing country, it may end up hiring more people in developing countries, it can still generate money because the hired personnel receive lower salaries compared to those in the country of origin. However, the multinational company can negatively affect other small local companies in the local market towards by exporting for instance similar products but of more developed quality or by hiring more qualified workforce or staff but it has to focus on more investment possibilities, the multinational company with its multinational strategy may eliminate local creativity or possibilities that other local entrepreneurs have got to raise their businesses towards international markets.

The impact of a multinational company that wants to make foreign direct investments in other markets can be positive or negative.

Foreign direct investment can be positive for the shareholders of multinational companies, surely or without a doubt, because when a company expands its business to other markets to produce or sell, it does increase profits, profitability, and that is beneficial directly from the shareholders who are the owners of the company. In fact, for shareholders and main companies it is important that the multinational company has operations in multiple countries because its way of growing is its way of reducing its costs and obtaining greater profitability.

The impact of Multinational companies (MNCs) on the balance of payments

When it comes to the current account or the capital account, it is about exports and imports, because the current account records all the transactions that the country carries out in a calendar year, then the impact that the multinational company has on the balance of payments will be made for both imports and exports.

On the import side: The effect on the balance of payments is positive if foreign direct investment results in an increase in imports and negative if it produces an increase in imports.

On the export side: the effect on the balance of payments is positive if foreign direct investment generates exports in the host country and negative if it produces only for the local market and stops exports.

The possible challenging factors for Multinational companies (MNCs) and foreign direct investments (FDIs)

Multinational companies may be exposed to various challenging factors while going for foreign direct investments to internationalize their services, operations or business insights. Thus, foreign direct investments (FDIs) may be exposed to risks as well during the internationalization process. This analysis and research presents and illustrates as well the main possible challenging factors for Multinational companies (MNCs) and Foreign direct investments (FDIs) in figure 2. (See figure 2).

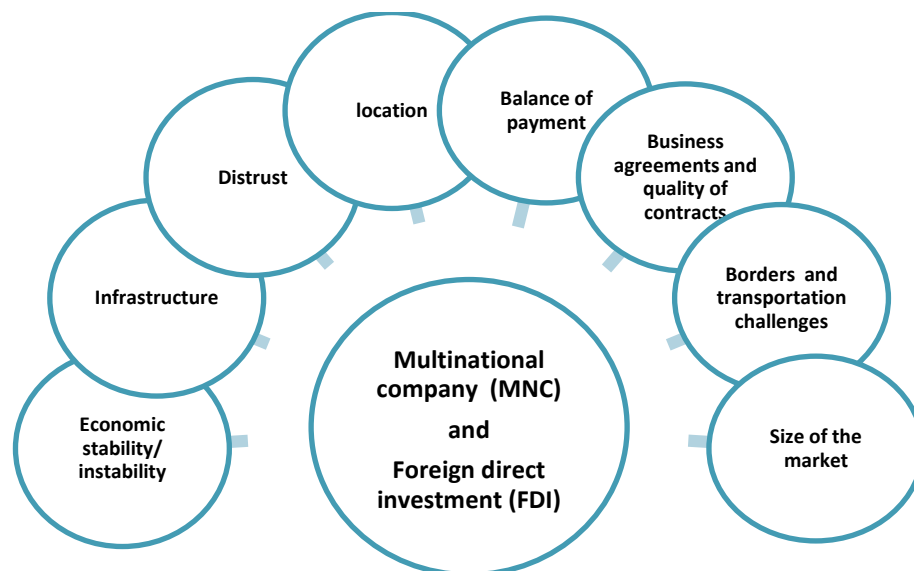


Figure 2. Possible challenging factors for FDI and MNCs

Source: Author's research and design, 2024

Multinational companies that are considered as one of the important internationalization strategy may transform from the domestic shape to the multinational shape if they go for foreign direct investments in other locations globally to compete well in

other markets, leave the difficulties of the domestic area and boost their business position and leadership in international markets or just other foreign markets for more profit and values. (See figure 2).

Multinational companies (MNEs) and foreign direct investments (FDIs) may face in the new locations economic and political instability, difficulties of infrastructure, distrust in the locations, risky locations, difficulties of balance in payment, challenging negotiations in business agreements and quality contracts, borders and transportation challenges, challenging market size. (See figure 2).

The importance of FDI for business internationalization and new locations

Foreign direct investments (FDIs) are a huge a possibility for job creation, using and offering advanced technology, increasing the level of exports, boosting the economic growth and they are important to boost and develop the infrastructures of the new locations.

Multinational companies go multinational to increase their profits and increase their competitive advantage for business values. (See figure 3). Foreign direct investments are considered helpful business international processes for multinational companies and the countries or economies of destinations. (See figure 3).

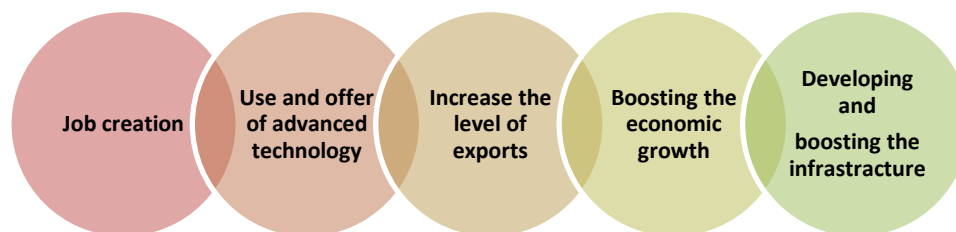


Figure 3. The importance of FDI for business internationalization and new locations

Source: Author's research and design, 2024

MNCs and the values of Foreign direct investment FDI

Figure 4 illustrates the value of FDI inflows globally from 2012 to 2022 in trillion US dollars. In 2022, the global inflows of foreign direct investment (FDI) amounted to approximately 1.3 trillion U.S. dollars. This was a decrease of approximately 12% compared to the previous year. According to the available data illustrated in figure 4, we observe that the value of FDI was at its highest in 2016, reaching nearly 2.1 trillion U.S. dollars and 2015 as it

was high with approximately the same amount as 2016 but with 2.03 US trillion dollars. (See figure 4). But if we compare all 2012 and 2022 that was a decade, the amount of FDI inflows in 2012 was higher with the amount of 1.57 US trillion dollar than 1.3 US trillion dollars in 2022. (See figure 4).

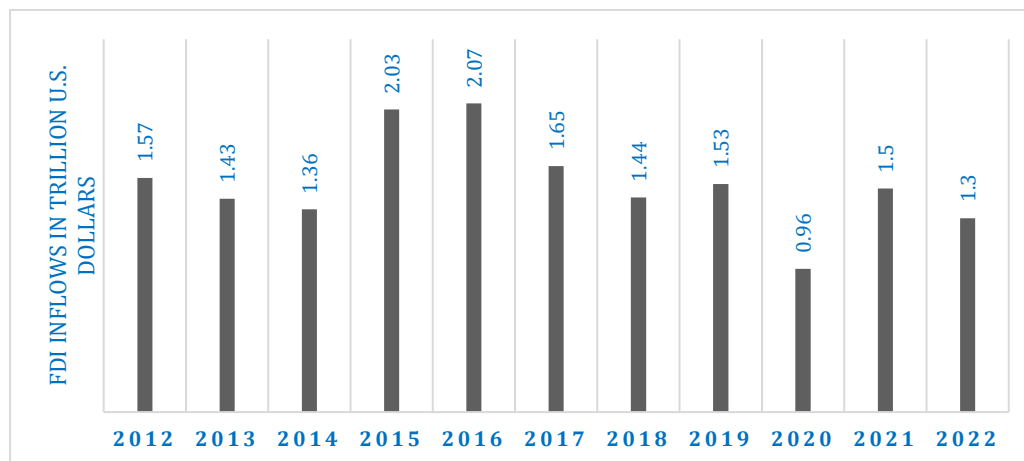


Figure 4. Value of FDI inflows worldwide 2012-2022 in trillion US dollars

Source: Author's contribution, UNCTAD data, Statista data, 2023

The lowest amount of FDI inflows globally in the observed decade was in 2020, a decrease to 0.96 US trillion dollars. The 2020 decline and decrease may be due to the widespread of Covid-19 pandemic that caused a global recession but the amount of FDI inflows increased in 2021 to 1.5 US trillion dollars and that is due to the period of expansion in the last quarters of 2021. The decrease again of the amount of FDI inflows in 2022 may be due the Russian-Ukrainian geopolitical tensions and conflict and the consequences international restrictions and lockdowns against the Covid-19 pandemic. (See figure 4).

Figure 5 illustrates the value of foreign direct investment (FDI) outflows globally from 2012 to 2022 in US trillion dollars. In 2022, global foreign direct investment (FDI) outflows amounted to 1.5 trillion U.S but it decreased from 1.75 US trillion dollars that was the amount of 2021. In 2020 the amount of FDI outflows reached 1.3 trillion dollar sand that was the lowest in all the decade due to some factors as the global outbreak and widespread of the Covid-19 pandemic in 2020. (See figure 5).

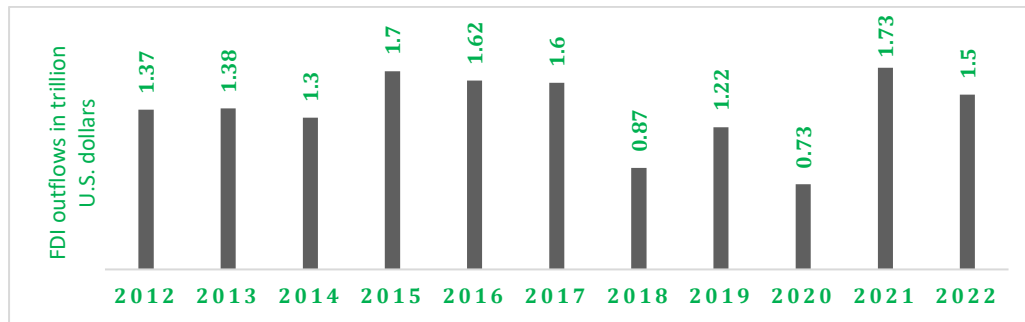


Figure 5. Value of FDI outflows worldwide 2012-2022 in trillion US dollars

Source: Author's contribution, UNCTAD data, Statista data, 2023

From 2012 to 2014 the value of FDI fluctuated from 1.37 trillion US dollars to 1.3 trillion US dollars, so it was nearly similar and that shows the fact that there was a global stability. (See figure 5).

From 2015 to 2017 there was another stability in the value of FDI globally with an increase in value to 1.7 US trillion dollars but it slightly decreased to 1.6 trillion US dollars, then it decreased to 0.87 trillion US dollars and could be due to difficulties in negotiations or some of the challenging factors illustrated in figure 2. (See figure 2). If we compare the value of FDI inflows and outflows we observe that they look approximately the same in fluctuation in the same decade 2012-2022. (See figures 4 and 5) and that makes sure that there was a possibility that multinational companies and the countries of destinations tried to balance FDI from a year to another. (See figures 4 and 5).

Figure 6 illustrates the 2022 leading non-financial multinational companies (MNCs) globally by foreign assets (in billion U.S. dollars).

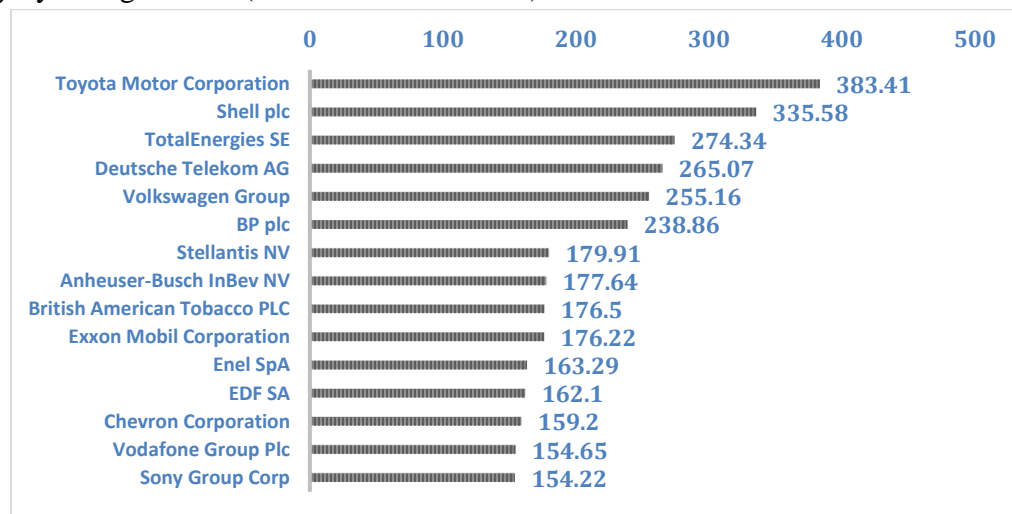


Figure 6. Leading non-financial multinational companies (MNCs) globally in 2022, by foreign assets (in billion U.S. dollars)

Source: Author's contribution, UNCTAD data, Statista data, 2023

According to the available data by UNCTAD and Statista in 2023 that are illustrated in figure 5, Toyota was the leading non-financial multinational company (MNC) with 383.4 billion U.S billion US dollars in 2022 in foreign assets, followed by Shell plc with 335.58 billion US dollars in the same year (See figure 6). However, Shell, Total Energies SE, Deutsche Telekom, and Volkswagen rounded up the top five MNE in foreign assets. The lowest leading non-financial multinational companies from all the list were Vodafone Group Plc and Sony Group Corp with similar amounts (154.22 billion US dollars). We may say the importance of brand, reputation and the capacity of negotiation play an important role in this classification. (See figure 6).

Suggested strategy steps for business internationalization with FDI and other companies' operations (with a focus on the multinational strategy)

Figure 7 illustrates and suggests some steps for business internationalization in case of foreign direct investment (FDI) and other companies' operations with a focus on the multinational strategy.(See figure 7).

The domestic company that would like to go multinational to leave the internal market difficulties has to focus on a plan for internationalization possibility and check the international conditions for business internationalization. Moreover, this suggested strategy is important for companies to focus first on a strategic selection of suitable countries for internationalization by focusing more on the new potential locations. In addition, developing an external plan by the companies CEOs and CMOs is highly important with a focus on negotiations and efficient contacts with the stakeholders. (See figure 7).

The company has to plan first for the internationalization possibility by focusing on the internal conditions for business internalization with a following strategic selection of suitable countries for the process of internationalization, choosing the correct entry mode and method and strategy to transform from domestic to multinational, international, transnational or global is very important. (See figure 7). If companies choose to multinationalize their business and become multinational they have to focus on potential locations with an in-depth investigation of the foreign locations, negotiations with the stakeholders can be a challenging step but they are essential for efficient contracts, the contracting can be challenging because needs to rely more on trust and common benefits that's why developing an external plan for the internationalization process is very important by checking the potential factors of the domestic company first before the internationalization process and later from time to time during the process, for the multinational strategy the company has to focus on the three key factors provided in the Dunning paradigm that are ownership, location and internalization in order to go for business internationalization with foreign direct investments (FDIs) so that it can start ccontrating with the new locations but based on the laws and rules provided by the stakeholders. Thus, a resilience plan is really needed for the internationalization process since the multinational company moves towards economies and foreign markets with new cultural

aspects and preferences within the dimensions of globalization that are political, economic, cultural, social and technological. (See figure 7).

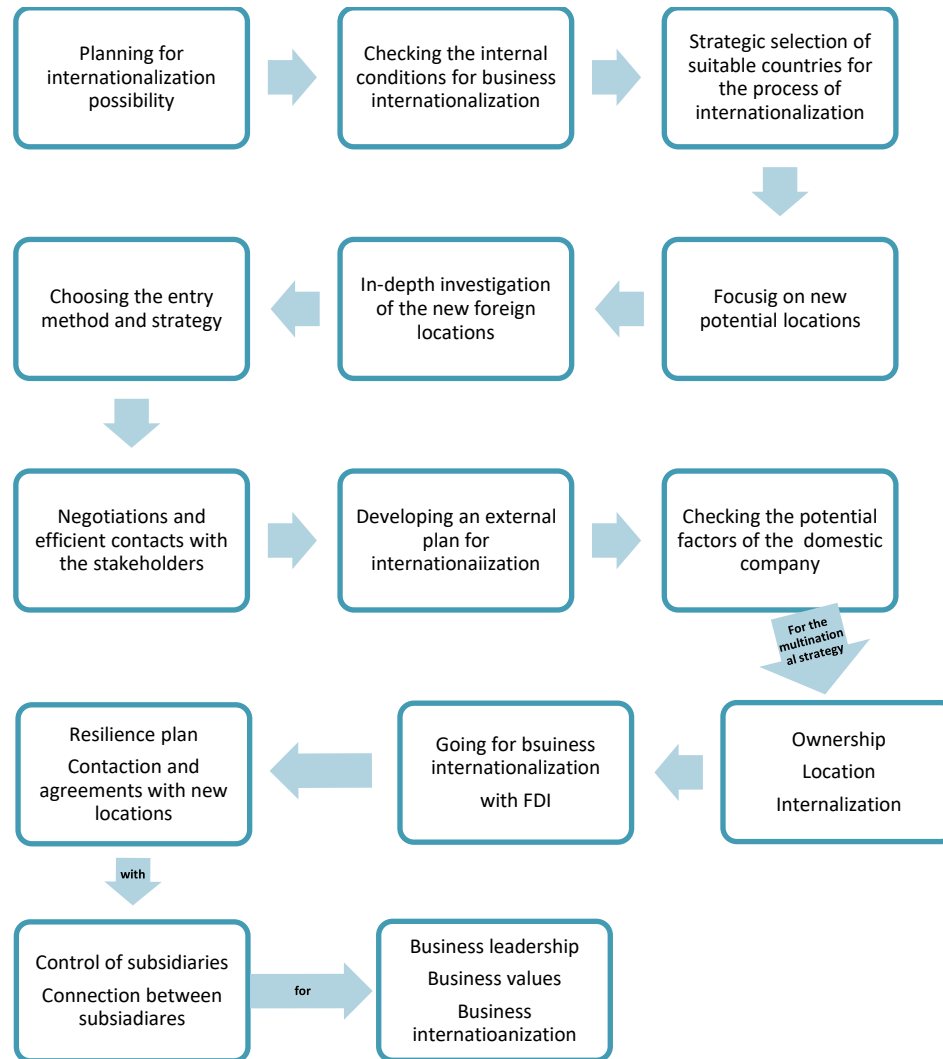


Figure 7. Suggested steps for business internationalization with FDI and other companies' operations (with a focus on the multinational strategy)

Source: Author's design and research, 2024

The multinational company has to set a control on its subsidiaries with a possible mutual connection between them, the thing that may help save its business and protect workers in case of crisis or risks whether predicted or unpredicted. (See figure 7). Mainly, with the internationalization process the multinational company focuses on business internationalization by entering foreign markets but it always seeks how to reach business values and such a leadership position. Market leadership for multinational companies in the new locations could be a very important point and goal but it can affect other local companies from those

destination and contribute to such and unbalance in their economy if the multinational company generates more benefits for its headquarters for than the economies for destinations, the thing that may affect their GDP. (See figure 7).

Choosing a suitable entry mode is very important such as the multinational entry mode with FDI but it requires an in-depth investigation of the new locations and checking the potential factors of the domestic company as mentioned in the OLI model (See figure 1). Focusing and testing the domestic company's ownership, new potential locations abroad and its factor of internalization could lead it to the possibility of business internationalization with foreign direct investment (FDI). (See figures 1 and 7). In fact, during the internationalization process and various operations of the multinational company abroad (See figure 7) a resilience plan is very important with an in-depth focus on the quality of contacts and agreements between the multinational company, its subsidiaries and stakeholders from the new locations in order to reach business leadership, values and long possible sustainable business internationalization. (See figure 7).

Conclusions

This research proposed and developed a systematic analysis regarding the importance and relevance of both multinational companies (MNCs) and foreign direct investment (FDI) by highlighting their importance and possibility for business internationalization. The results and analysis focused on the move from the relevant previous literature to the aim of study to develop somehow an analysis of multinational companies, business internationalization and foreign direct investment by explaining the moderating impact of a MNC's internationalization on the importance of the location level. A multinational company's pattern of internationalization represents different factors of possibilities, costs, risks and difficulties faced during its internationalization process. As multinational companies are considered one of the main strategies of business internationalization, they need to focus on the factors mentioned in the eclectic paradigm of Dunning such as their ownership, suitable locations for their operations abroad and the factor of internalization in order to go multinational and move towards foreign direct investments (FDIs).

Multinational companies that make foreign direct investment have an economic impact and can affect a country's economy in various ways, for example, in the balance of payments, in growth rates and in job creation. The effect of foreign direct investment by multinational companies can be negative or positive depending on certain factors. Internationalization strategies are a system that is used to plan and implement actions that are aimed at fulfilling and positioning a company in the international market. (Benabed, 2023). Internationalization allows companies to achieve at least a competitive advantage to increase their presence in the international market, therefore it is important that they are well designed and since based on

this the company will be able to enter new markets to increase value or profit, the number of their customers and sales.

Through internationalization, the company can introduce products or services to other countries that do not yet have them or do not have them. (Benabed, 2023). So the analysis and results are aligned as well with many points of the literature review. In general, companies including the multinational ones have different internationalization patterns, level, scope, and experience that may help them overcome constraints to focus on their needs and goals while entering other markets. In times of crisis of unpredictable risks multinational companies may transfer their business, employees and platform from the affected area to one of its safe areas or locations in other countries or destinations. Thus, multinational companies may be a huge a step in business internationalization, benefits may be engendered and generated for the home company and subsidiaries. In other words, both home countries and countries of destinations may engender benefits from the process of FDI or any other operations the multinational companies take over. However, efficient negotiations and agreements, resilience plans to mitigate the risks, low taxes, safe locations and quality contracts are essential in every single step multinational companies take up.

The abstract effectively summarizes the main points of the article, highlighting the focus on multinational companies (MNCs) and foreign direct investment (FDI) as strategies for business internationalization in the context of globalization. The abstract clearly outlines the challenges and potential impacts of FDIs on economies, both positive and negative, and sets the stage for discussing Dunning's framework for internationalization.

The introduction provides a solid foundation for the paper, explaining the significance of capital mobility in a globalized economy. It sets the context for why companies seek to internationalize through FDIs, addressing the associated challenges such as economic and political instability, infrastructure issues, and market size limitations. The results section should ensure clarity in presenting the figures and models mentioned, and it would benefit from more specific examples or case studies to illustrate the theoretical points.

The conclusion section succinctly summarizes the key different findings of the paper, reiterating the importance of considering ownership, location, and internalization factors in FDI decisions. It effectively reinforces the paper's contributions to understanding the role of multinational companies in globalization and the process of FDI that is a important key process for business internationalization and companies internationalization such as the internationalization of multinational companies. As this full paper is related to the PhD research and thesis, it is part of it as well since it completes one of the chapters its content that belongs to of the same author of this full paper.

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TRANSFORMING HIGHER EDUCATION IN MOLDOVA: A JOURNEY THROUGH DIGITALIZATION, AI AND FINANCIAL CONSIDERATIONS

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Abstract: *This paper analyzes Moldova's higher education transformation, focusing on digital and AI integration, underpinned by the Moldova Higher Education Project financed by the International Development Association. Findings highlight the project's effectiveness in aligning education with labor market demands through AI-driven personalized learning and administrative automation, significantly enhancing learning environments and operational efficiencies. Challenges include the need for improved digital infrastructure and equitable technology access. The study offers actionable recommendations for policymakers, such as enhanced AI training for educators and policy development to ensure fair access to technology. These insights contribute significantly to understanding and implementing educational reforms in similar contexts.*

Keywords: *digital transformation, higher education, Moldova, financing.*

UDC : 378.014.543:004.8

JEL Code: I23, I25, O33, H52.

Introduction

As we step into the digital age, Moldova's higher education system stands on the brink of transformative change (Ministry of Education and Research of the Republic of Moldova, 2022). This shift towards digitalization and artificial intelligence (AI) integration heralds a significant paradigm shift, poised to revolutionize the delivery and consumption of educational content and align educational outcomes with labor market demands. However, it also raises critical questions regarding accessibility, quality, and the ethical use of technology in education.

Moldova, with its unique socio-economic landscape, faces distinct challenges and opportunities in integrating digital technologies and AI into its educational frameworks. These technologies promise to enhance educational accessibility and quality while preparing students for a digitally-driven workforce. However, the integration process is complex, requiring robust infrastructure, digital literacy among educators and students, and careful consideration of ethical implications.

Central to Moldova's educational transformation is the Moldova Higher Education Project (MHEP), financed by a EUR 35.7 million credit from the International Development Association. This project is pivotal in the government's strategy to enhance the quality,

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affordability, and market relevance of higher education (Ministry of Education and Research of the Republic of Moldova, 2023a). Moreover, Sub-component 1.3 of MHEP, with a budget of EUR 0.7 million, focuses specifically on higher education financing, aiming to pilot and implement a performance-based financial model that channels more public funds towards improving educational quality (Government of Moldova, 2023; Ministry of Education and Research of the Republic of Moldova, 2023a, 2023c).

This paper aims to provide a comprehensive overview of the ongoing digital transformation in Moldova's higher education system, focusing on the integration of AI and its financing mechanisms. It builds on extensive literature reviews, document analyses, and data synthesis to offer a holistic understanding of the challenges faced and the strategic approaches employed. By doing so, it seeks to contribute valuable insights into how Moldova can navigate and excel in this transformative educational era.

The structure of this paper is organized as follows: After this introduction, the methodology section outlines the research approach and methods used. The subsequent sections discuss the current state and priorities of Moldovan higher education, delve into the role and potential of AI in education, and explore the challenges and opportunities within the sector. Finally, the paper concludes with a discussion on financing the digitalization of higher education in Moldova, followed by a summary of the findings and recommendations for future research and policy-making.

Methodology

This study uses a combined approach of literature review, document analysis, data synthesis, and critical evaluation to explore the digitization of higher education in Moldova. This section outlines the methods used, identifies methodological challenges, and discusses the limitations encountered.

The literature review established a theoretical framework and contextual background, focusing on digitalization in global and Moldovan higher education. The main challenge was the scarcity of specific scholarly literature on Moldova, necessitating the use of broader Eastern European studies.

Relevant documents, including policy documents and project outlines related to the Moldova Higher Education Project, were analyzed (Government of Moldova, 2023; Ministry of Education and Research of the Republic of Moldova, 2023a, 2023c). Accessing up-to-date documents posed a challenge, sometimes requiring direct requests to government employees for the latest information. Data from the review and analysis were synthesized to create a coherent narrative, identifying key themes and integrating insights specific to Moldova. The selection and interpretation of data introduced potential biases, mitigated by maintaining a critical stance.

The strategy of Moldova's higher education was critically evaluated against global trends and local needs. The main challenge was maintaining objectivity and avoiding confirmation biases, particularly in qualitative assessments. To ensure robust findings, the research scope was clearly defined, and a systematic approach was used for the literature review and document analysis.

Despite its limitations, this methodology facilitated a balanced examination of digital transformation in Moldovan higher education. Future research would benefit from more primary data sources and collaborations with local educational authorities.

Current State and Priorities of Moldovan Higher Education in 2024

In 2024, the higher education system in the Republic of Moldova is poised at a critical juncture, marked by a focused drive towards improvement and modernization. The Ministry of Education and Research (MoER) has set forth a series of priorities aimed at reshaping the landscape of higher education to better meet the needs of students and the labor market, while also enhancing Moldova's standing in the international academic community (Ministry of Education and Research of the Republic of Moldova, 2023d). These priorities are integral to the country's broader educational strategy and are supported by significant investments and policy initiatives.

One of the primary goals for 2024 is *to increase the proportion of high school graduates who choose to pursue higher education within Moldova*. This objective is underpinned by substantial financial investments, amounting to hundreds of millions of lei, directed towards upgrading and renovating university facilities, including lecture halls and dormitories. This investment is expected to make higher education more appealing and accessible to potential students, thereby boosting enrollment rates.

Another major focus is on *enhancing the employability of university graduates*. The Ministry plans to introduce a mechanism for monitoring graduate employment rates by integrating various national information systems. This initiative aims to provide real-time data on the employment status of graduates, thereby facilitating more responsive and targeted educational programming. Additionally, the curriculum is being revised to align more closely with market needs, particularly through the involvement of business and industry stakeholders. Universities demonstrating higher employability rates among their graduates are set to receive additional funding, incentivizing institutions to adapt their programs to the evolving labor market.

The integrity of academic programs and research is also a top priority. Measures to achieve this include increasing the salaries of university staff and allowing universities to develop their own salary scales. This approach is expected to attract and retain high-caliber academic and research personnel. The MoER is also focused on implementing a national anti-plagiarism software and adjusting funding formulas to encourage fair and objective student

evaluations. These steps are crucial for maintaining high academic standards and ensuring the credibility of Moldovan higher education institutions.

The MoER is dedicated to *increasing the number of international students in Moldova by 50%*. This ambitious goal involves developing a national brand for Moldovan higher education and providing additional funding to universities that successfully attract foreign students. Efforts also include the complete renovation of a university dormitory to accommodate international students and fully utilizing the approximately 1,000 annual Erasmus scholarships available. This *internationalization strategy* is expected to enhance the global visibility and reputation of Moldovan higher education.

The MoER's priorities for 2024 reflect a comprehensive and strategic approach to advancing the higher education system in the Republic of Moldova. These priorities are aligned with global educational trends and are geared towards creating a more dynamic, competitive, and internationally recognized higher education environment. With a focus on quality, employability, integrity, and internationalization, Moldova is taking significant steps towards transforming its higher education sector into a more effective and influential part of the global academic community.

The Moldova Higher Education Project

The Moldova Higher Education Project, running from 2020 to 2025, represents a concerted effort to align the nation's higher education system more closely with labor market demands and to enhance the quality assurance mechanisms within this sector (Ministry of Education and Research of the Republic of Moldova, 2023a). This initiative, funded by the International Development Association, is an ambitious and comprehensive project that addresses several key aspects of higher education in Moldova.

The primary objective of the MHEP is to improve the labor market orientation of selected higher education institutions and to enhance the quality assurance mechanisms within the Moldovan higher education system. The expected outcomes by the end of the project include an increased share of students enrolled in bachelor programs in high demand in the labor market, the development of a robust labor market information system, the registration of the National Agency for Quality Assurance in Education and Research in the European Quality Assurance Register, and the establishment of an effective higher education management information system.

The MHEP is structured into three main components, each targeting specific areas of the higher education system:

1. *Improving Quality Assurance Mechanisms*. This component focuses on enhancing Moldova's higher education system's quality assurance mechanisms. It includes efforts to align the National Qualifications Framework with international standards and to

finance relevant activities that contribute to the overall management and monitoring capacity of the system. This approach is designed to benefit all public higher education institutions in Moldova, providing reliable information on labor market needs and job opportunities to Moldovan citizens and university graduates (Ministry of Education and Research of the Republic of Moldova, 2023a).

2. *Improving Labor Market Orientation through Targeted Interventions.* This component aims to finance the design and implementation of the Higher Education Improvement Program (HEIP), which is tailored to improve the labor market orientation of Moldova's higher education institutions. This program is expected to primarily benefit nine public higher education institutions in various fields such as engineering, information and communication technologies, health, education sciences, and environmental sciences. The program also encompasses the potential for financing improvements in laboratories, thereby supporting research at the institutional level (Ministry of Education and Research of the Republic of Moldova, 2023a).
3. *Project Management.* The third component is concerned with the day-to-day management and monitoring of the MHEP. It involves the establishment and maintenance of a Project Management Team (PMT) that provides managerial, fiduciary, and technical support throughout the project's duration. Additionally, this component includes financing project monitoring studies or surveys, annual project audits, and the design and implementation of a project-specific Grievance Redress Mechanism (GRM). The GRM is designed to capture grievances through various channels, including telephone and internet-based applications, with the results being made public by the Ministry of Education and Research (Ministry of Education and Research of the Republic of Moldova, 2023a).

The MHEP incorporates systemic interventions in quality improvement, labor market orientation, and higher education financing. These interventions are evident in the project's comprehensive approach, which includes developing and implementing advanced information systems like the unified electronic higher education admission system (e-Admission), the Higher Education Management Information System (HEMIS), and the Labor Market Information System (LMIS). These systems are expected to produce data that will inform plans and decisions at both the system and institutional levels, ultimately leading to a more responsive and relevant higher education system in Moldova (Ministry of Education and Research of the Republic of Moldova, 2023a).

The Moldova Higher Education Project is a strategic and well-structured initiative aimed at addressing critical areas in the nation's higher education system. Its focus on quality assurance, labor market orientation, and effective management and monitoring positions it as a pivotal project in the evolution of higher education in Moldova.

The Role and Potential of AI in Moldovan Education

Artificial Intelligence in education in Moldova is currently manifested through personalized learning algorithms, intelligent tutoring systems, and various administrative automation tools, each serving to enhance the educational landscape. Personalized learning algorithms adjust learning content and pacing to individual student needs, moving away from the traditional uniform approach (Shemshack, Kinshuk, & Spector, 2021). Intelligent tutoring systems complement this personalization by providing real-time feedback and instruction, which is invaluable in settings where resources are limited and traditional student-to-teacher ratios are challenging to maintain (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019).

Additionally, AI in Moldova automates routine tasks such as grading and attendance, allowing educators to focus more on teaching and less on administrative responsibilities. This not only improves operational efficiency but also reallocates educational resources more effectively.

The potential of AI extends to analytics that can provide insights into student performance and learning behaviors, informing more effective curriculum designs and teaching strategies. Such capabilities are crucial as Moldova aligns its educational strategies with both local market demands and global educational standards (Guan, Mou, & Jiang, 2020).

However, the implementation of AI technologies in education also raises significant ethical concerns, including data privacy, algorithmic bias, and equitable access to technology (O'neil, 2017). Protecting student data is critical to prevent breaches and misuse (Lingard, Wyatt-Smith, & Heck, 2021). Algorithmic bias must be carefully managed to ensure that AI tools do not perpetuate existing inequalities but rather promote fairness and impartiality (Crompton & Burke, 2023).

Equitable access to AI technology is another critical issue. The benefits of AI in education cannot be fully realized if access is limited to students from higher socio-economic backgrounds. This challenge is pronounced in Moldova, where disparities might restrict access to necessary technological resources.

To tackle these issues, Moldova needs to invest in substantial digital infrastructure and develop comprehensive policies for the ethical use of AI in education. Educator training on both the technical and ethical aspects of AI, as well as frameworks to ensure the equitable use of AI tools, are essential for harnessing the benefits of AI while minimizing potential harms.

Challenges and Opportunities in Moldovan Higher Education

The higher education sector in Moldova is navigating through a period of significant challenges and opportunities.

One of the major challenges is ensuring that *higher education aligns with the labor market needs* (European Training Foundation, 2020; Ministry of Education and Research of the Republic

of Moldova, 2023b; Vasilescu, 2019). The Moldova Higher Education Project is addressing this issue by implementing systemic interventions for improving higher education quality, financing, and management. This includes targeted programs in pedagogy, engineering, information technologies, and medicine. Despite these efforts, a gap persists between the skills taught at universities and those demanded by employers, leading to a mismatch in the labor market.

Another significant challenge is the delay in *digital transformation*, a crucial aspect of modernizing Moldova's higher education system (Ministry of Education and Research of the Republic of Moldova, 2023b). The development of the e-admission system and Higher Education Management Information System (HEMIS) under MHEP has been slower than anticipated due to revisions in concepts and the need to integrate these systems with existing university management systems. Such delays can impede the pace at which educational institutions adapt to digital advancements.

Furthermore, Moldova's higher education sector is constrained by *limited resources*, which impacts its ability to implement new technologies and pedagogical approaches (Ministry of Education and Research of the Republic of Moldova, 2023b). This challenge is exacerbated by the need for substantial investments in digital infrastructure and training for educators to effectively use new technologies.

Ensuring the *quality of higher education* is also a persistent challenge (Ministry of Education and Research of the Republic of Moldova, 2023b; Vasilescu, 2019). Although MHEP includes mechanisms for quality assurance, there is an ongoing need to maintain high educational standards and adapt to evolving global education trends.

On the other side of these challenges lie significant opportunities. By closely aligning higher education with market needs, Moldova has the opportunity to *enhance the employability of its graduates*. Collaborations between universities and industry can lead to more relevant curricula and better-prepared graduates (Ministry of Education and Research of the Republic of Moldova, 2023b). Despite the challenges, digital transformation presents significant opportunities. By successfully implementing systems like e-admission and HEMIS, Moldovan higher education institutions can streamline administrative processes, enhance data-driven decision-making, and improve student experiences.

Additionally, the challenges of resource limitations and quality assurance can be addressed by *innovating in pedagogy and curriculum design*. This includes incorporating more practical, hands-on learning experiences and leveraging online resources to supplement traditional teaching methods (Ministry of Education and Research of the Republic of Moldova, 2023b). Moldova also has the opportunity to *internationalize its higher education system* (European Commission, 2016). This includes participating in international research collaborations, exchange programs, and attracting foreign students, which can enhance the global visibility and reputation of Moldovan higher education institutions.

While the higher education sector in Moldova faces significant challenges, particularly in aligning with the labor market and navigating digital transformation, these challenges also present opportunities for substantial growth and improvement. By leveraging these opportunities, Moldova can enhance the quality, relevance, and global competitiveness of its higher education system.

Strategies for Fostering Meaningful Stakeholder Engagement

As Moldova navigates the challenges of digital transformation in higher education, engaging a diverse array of stakeholders is crucial for the success of educational reforms. Meaningful engagement involves not just periodic consultation but continuous involvement of students, educators, industry partners, and government bodies throughout the reform process. This collaborative approach ensures that the reforms are comprehensive, inclusive, and widely supported, ultimately leading to more effective implementation and better outcomes.

Students and educators are the primary beneficiaries and contributors to the educational system. Their direct involvement can be facilitated through structured feedback mechanisms such as *surveys and focus groups, which should be regularly conducted to gather insights on their experiences and needs (European Commission, 2016)*. Additionally, establishing forums and committees where students and teachers can voice their concerns and suggestions not only helps in tailoring the reforms to actual needs but also empowers them as co-creators of the educational environment.

Industry partners provide valuable insights into the skills and competencies required in the workforce, making their involvement critical in aligning educational outputs with labor market demands. Moldova can enhance this engagement through *partnerships that include developing internship programs, guest lectures, and curriculum development collaborations*. These partnerships ensure that the educational programs are relevant and that students are better prepared for professional challenges (European Training Foundation, 2020).

The government plays a pivotal role in shaping educational policies and ensuring the alignment of reforms with national development goals. *Regular policy dialogues and advisory panels* involving educational leaders and policymakers can facilitate a deeper understanding of educational challenges and the efficacy of proposed reforms. Such platforms also allow for the adjustment of policies in real-time based on feedback from other stakeholders (Ministry of Education and Research of the Republic of Moldova, 2023a).

Public consultations and workshops are effective tools for involving a broader community in the educational reform process. These activities should be designed to be inclusive, allowing participation from parents, local communities, and non-governmental organizations. Workshops can be particularly useful in educating stakeholders about the

specifics of digital transformation and AI integration in education, thereby building a knowledgeable community that supports reform efforts.

To ensure that the diverse perspectives of all stakeholders are considered, it is essential to *include representatives from each stakeholder group in the decision-making process*. This can be achieved by setting up advisory committees and governance bodies that reflect the composition of the broader educational community. Such inclusion not only enriches the decision-making process but also enhances the transparency and accountability of educational reforms.

Engaging stakeholders in meaningful ways is foundational to the success of educational reforms in Moldova. By actively involving all relevant parties (students, educators, industry experts, and government officials), Moldova can ensure that its digital transformation strategies in education are well-informed, broadly supported, and effectively implemented. These engagement strategies not only facilitate smoother transitions but also foster a culture of collaboration and mutual respect among all parties involved, thereby enhancing the overall quality and relevance of higher education in the nation.

Financing the Digitalization of Higher Education in Moldova

The digital transformation of education in Moldova, particularly the integration of new technologies and the application of AI, necessitates substantial financial investment (Andronic, 2023a, 2023b). The Moldova Higher Education Project has been a cornerstone in this journey, with a significant allocation of resources dedicated to enhancing the quality and relevance of higher education. This chapter examines the financial strategies and components underpinning this transformative process.

The MHEP, with a total cost of EUR 9.2 million, aims to improve the quality assurance mechanisms and labor market orientation of Moldova's higher education system (Ministry of Education and Research of the Republic of Moldova, 2023a). The project is structured into three key sub-components: National Qualifications Framework and Quality Assurance, System Management and Monitoring, and Higher Education Financing. The latter, allocated EUR 0.7 million, is particularly crucial for the digitalization of higher education system (Ministry of Education and Research of the Republic of Moldova, 2023a). Its primary objective is to improve the internal efficiency of Moldova's higher education system, thereby channeling more public funds towards quality improvement. This sub-component supports the piloting and implementation of a financial model developed by the Ministry of Education and Research in 2018, which includes a performance-based component (Government of Moldova, 2023; Ministry of Education and Research of the Republic of Moldova, 2023a, 2023c).

Financing digital transformation in higher education involves substantial costs related to infrastructure, software development, training, and maintenance. The performance-based financial model encourages institutions to prioritize digitalization and innovation in teaching and

learning methodologies. This model also ensures that funds are allocated efficiently, with a focus on achieving measurable improvements in educational outcomes. However, a key challenge in financing digitalization is ensuring sustainable and long-term funding. Strategic partnerships with international organizations, private sector involvement, and government support are crucial for financial sustainability. The focus should also be on developing a cost-effective approach to digitalization, leveraging existing resources, and avoiding unnecessary expenditures.

As digital transformation continues, ongoing financial support and investment will be essential. Recommendations include exploring innovative financing mechanisms, such as educational technology grants, public-private partnerships, and international funding opportunities. The importance of continuous monitoring and evaluation of financial investments in digitalization to ensure effective use of resources and the achievement of desired educational outcomes is also paramount.

Financing the digitalization of higher education in Moldova is a complex but vital endeavor. The MHEP's targeted financial approach, particularly its performance-based component, plays a critical role in this process. Continued investment, strategic planning, and innovative funding solutions will be key to advancing Moldova's higher education system in the digital age.

Conclusions

The transformation of higher education in Moldova through digitalization and AI integration, as explored in this study, reveals a landscape ripe with both challenges and burgeoning opportunities. While the Moldova Higher Education Project has set a robust framework for aligning education with market needs and enhancing educational quality, this paper has unearthed the critical role of AI in modernizing educational practices and the strategic importance of sustainable financing models.

This analysis not only synthesizes the current state of Moldova's educational reforms but also pushes the boundary by offering fresh perspectives on the integration of AI within educational systems. It highlights the nuanced interplay between technological advancement and educational quality, underscoring the potential of AI to personalize learning and streamline administrative processes, thus making a significant leap from traditional educational methods.

To further the practical relevance of this study, specific policy recommendations are proposed. For instance, it is crucial for policymakers to consider phased investments in AI technologies, ensuring that infrastructure developments keep pace with technological needs. Moreover, training programs for educators should be prioritized to harness the full potential of AI tools, which could significantly impact teaching methodologies and student engagement.

Additionally, the study suggests the establishment of a multi-stakeholder consortium to continuously assess the impact of digital investments and AI integration. This body would

ensure that the educational reforms remain aligned with both technological advancements and the evolving needs of the labor market. Such proactive measures could provide a model for other nations looking to navigate similar transformations.

Future research should focus on quantitatively measuring the impact of digitalization efforts on student outcomes and employability post-graduation. It is also recommended that subsequent studies explore the long-term sustainability of AI-driven educational reforms, particularly in the context of Moldova's economic and social fabric.

By embracing a strategic approach to digital transformation, Moldova can enhance the quality, accessibility, and market relevance of its higher education system. This paper not only reaffirms the importance of integrating technology in education but also provides a blueprint for actionable strategies that can drive significant educational advancements, making a substantial contribution to the field and offering a roadmap for policymakers engaged in similar transformative endeavors.

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STRENGTHENING THE PUBLIC HEALTH SYSTEM IN THE TRANSNISTRIAN REGION AND THE REPUBLIC OF MOLDOVA THROUGH THE PRIZM OF DIGITISATION

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Svetlana GOROBIEVSCHI*₂

Abstract: *In recent years, the Republic of Moldova has been subject to a series of socio-economic and political challenges. Among the most notable are the Covid-19 pandemic (CoronaVirus 2019), the energy crisis and the political crisis (war in Ukraine). The impact of these crises have radically changed the way of life of the population and influenced the economy, bringing both negative and positive changes. Data were collected from external sources, using qualitative and quantitative method, as well as method of analysis and synthesis, induction, deduction and statistical inference. Comparative analysis was used as a research method in conducting the empirical study. In this article we aim to analyze the positive impact of the Covid-19 pandemic period on the healthcare system, namely: strengthening the public health system through digitalization in the Republic of Moldova and the Transnistrian Moldovan Republic. In order to make a comprehensive analysis of this phenomenon, the indicators that determine the level of development of public health were analysed, namely: the evolution of health expenditure and its share in GDP; life expectancy; medical staff in medical institutions; the degree of sickness and the level of requests for emergency medical assistance. The article presents the digital innovations implemented. Budget execution as an influencing factor was established by analysing the financing of the Semashko and Bismark health systems to expose the degree of flexibility of health service provision in the Republic of Moldova and the Transnistrian region. Thus, following the research, the authors concluded that the consolidation of the public health system through digitization in the Transnistrian region is at an early stage compared to the Republic of Moldova, which is in a stable development. This discrepancy is due to the fact that the Transnistrian region is developing the public health system according to its own scenario and without the involvement of external funding sources. Despite this, digital innovations are developing and are expected to be implemented in the future. Thus, we can observe a much slower development of the implementation of digital innovations to strengthen the health system.*

Keywords: *digitisation, quality of life, development strategy, population well-being, patient-centred hypothesis, health services, electronic register, quality of health services.*

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Introduction

The development of information technologies in recent times has a profound and immediate impact in all areas. The healthcare system is no exception and is being transformed to keep pace with the changes of recent years.

The originality of the research paper lies in strengthening the public health system in the Republic of Moldova and the Transnistrian region through the prism of digitisation.

In the paper is described the level of development of the healthcare system in the Transnistrian region and the Republic of Moldova, and argues the need to integrate the health sector into the European digital space. The prospect of public health transformation will improve the healthcare services offered to the population and will lead to the economic development of the countries in terms of optimising digitisation processes.

The aim of the research is to analyse the level of public health in the Republic of Moldova and the Transnistrian region, as well as the implemented digital technologies. This involves a broad investigation of indicators characterizing the level of public health development, as well as factors influencing public health development. Thus, the focus of this research paper is on strengthening the public healthcare system through digital technologies applied.

The specific objectives to achieve the research goals are:

- To describe the meaning and role of the concept of digitalisation of public healthcare;
- To analyse the digital innovations in medical lifecycle;
- To study the work of international practices in implementing digital innovation in the public health sector;
- Comparative analysis of public health financing systems in the Transnistrian region and the Republic of Moldova;
- To draw conclusions regarding the process of consolidation of the health sector through digitalisation.

Literature review

Globalisation, is seen as a phenomenon of accelerating economic development, is aligned with digital technologies influencing the social, economic, political and public health environment.

Thus, the implementation of digitised health technologies will provide citizens with secure control over access to personal data and give citizens digital tools to empower them to communicate with healthcare professionals and interact with healthcare providers. With the development of information technologies, digitisation, as a concept, can be defined as the process of implementing software-tools and hardware in the healthcare system.

The concept of digitisation of health is a broad term, encompassing many components, including e-health (electronic health), m-health (mobile health) and telemedicine, which encompasses most activities, from electronic patient records, remote monitoring, connected devices, digital therapy and more. This means using information technology, big data, artificial intelligence and machine learning to gather, share, analyse and use patient outcome data to help healthcare workers make cause and operational decisions.

The European Federation of Pharmaceutical Industries and Associations (EFPIA), (Digital Health, 2023) based on European research, proposes a methodology for the use of technology and digital data in the medicine lifecycle (Figure 1).



Figure 1. The use of technology and digital data in the medical lifecycle

Source: European Federation of Pharmaceutical Industries and Associations (EFPIA), „Digital Health” 2023-06-27. <https://www.efpia.eu/about-medicines/development-of-medicines/digital-health/>

The authors of the article consider in the future the possibility of homogenizing the medical system in the Transnistrian region and the Republic of Moldova by implementing digitization of medical systems on both sides of the Dniester.

Methodology of the research

The research paper is an intradisciplinary study with some aspects of interdisciplinary research in terms of the impact of Covid-19 and the political crisis (war in Ukraine).

In order to achieve the objectives of the research paper, the authors analyzed data published by the Central Bank and the Ministry of Health of the Transnistrian Moldovan

Republic (Transnistrian region), as well as statistical data from the National Bureau of Statistics of the Republic of Moldova.

The data were collected from external sources using qualitative and quantitative method, as well as the method of analysis and synthesis.

The methods of clustering, induction and statistical inference were also used. Comparative analysis was also used as a research method in conducting the empirical study. Various normative and legislative acts, works of domestic and foreign scientists, as well as other theoretical and practical materials were used as information support of the work.

Analysis and interpretation

The ongoing digital transformation puts the focus on the development of the health economy, which requires consideration of the theoretical underpinnings of the digitisation of people's lives, as well as the use of empirical analysis of changes in quality of life in cross-border regions in different countries.

In order, to make an analysis of the degree of digitisation in the public health environment, the authors propose to track the dynamics over a five-year period of the following indicators:

- Evolution of health expenditure in the Republic of Moldova and the Transnistrian region;
- Life expectancy in the Republic of Moldova versus Transnistrian region;
- Medical staffing of health care institutions in the Republic of Moldova and the Transnistrian region;
- Population morbidity in the Republic of Moldova versus Transnistrian region;
- Requests for emergency medical care served in the Transnistrian region versus the Republic of Moldova.

Thus, in figures 2 and 3 are presented the share of healthcare expenditure in the Republic of Moldova and the Transnistrian region.

We note that the pandemic period (Covid-19) in 2019-2020, has halted the development of the public health sector in both the Republic of Moldova and the Transnistrian region.

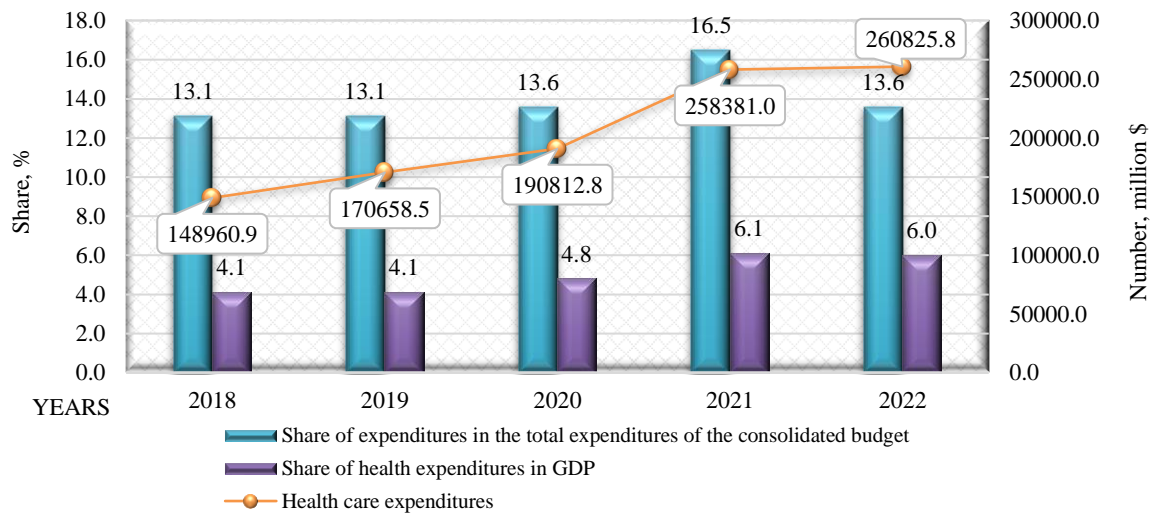


Figure 2. Evolution of the health care expenditure in the Republic of Moldova in 2018-2022

Source: compiled by the authors based on statistical databank of the National Bureau of Statistics of the Republic of Moldova.

The significant increase in the share of health expenditure in GDP by 1.7% in 2021, compared to 2020, shows that this crisis has been managed correctly. The year 2022 shows a decrease in economic growth due to the political crisis in neighbouring countries, namely the war in Ukraine.

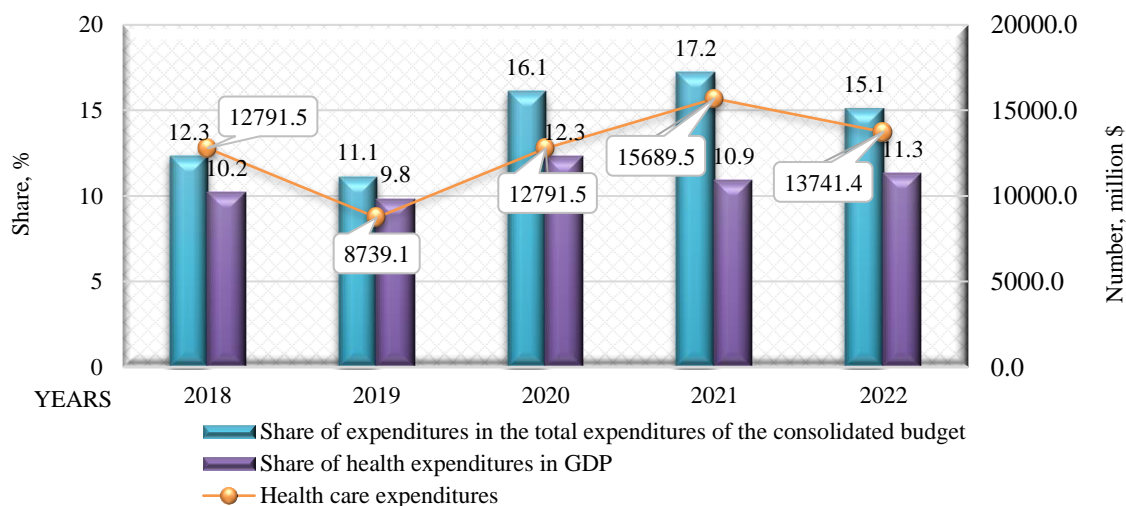


Figure 3. Evolution of the health care expenditure in the Transnistrian region in 2018-2022

Source: compiled by the authors based on statistical data of the Ministry of Health of Transnistrian region

Another indicator analysed in scientific research is life expectancy in the Republic of Moldova versus Transnistrian region, represented in Figure 4. Life expectancy is the number of years a newborn baby will live and depends to a large extent on the socio-economic

development of the country. Thus, the longevity of the population in both the Republic of Moldova and the Transnistrian region is constantly increasing.

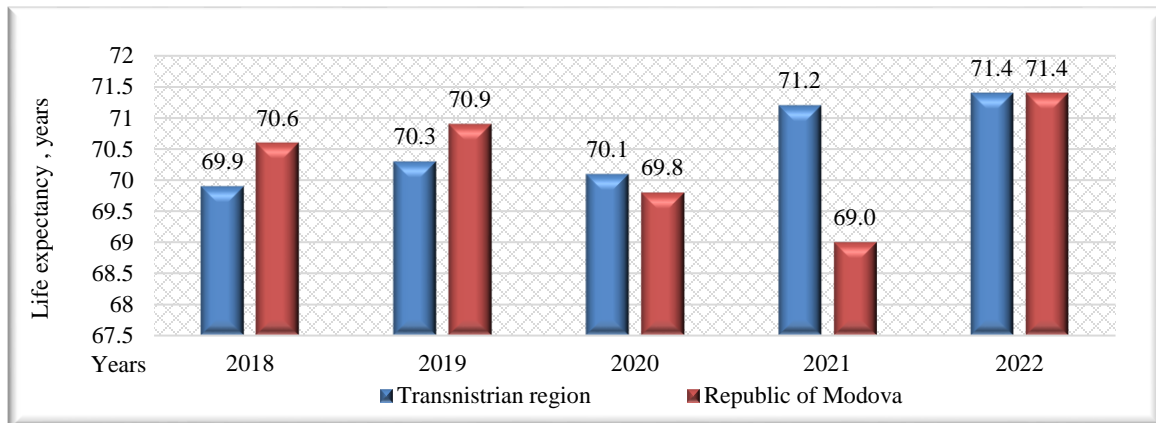


Figure 4. Life expectancy in the Republic of Moldova versus Transnistrian region

Source: compiled by the authors based on statistical data of the Ministry of Health of Transnistrian region and Statistical Yearbook of the Republic of Moldova

The following is an analysis of the medical staffing of medical institutions in the Republic of Moldova versus the Transnistrian region in 2018-2022.

Thus, in Figure 5 it can be observed a steady increase of 5,6% in 2020 at 2018 in the total number of doctors over the last five years in the Republic of Moldova. The number of family doctors and the average number of staff also showed a steady increase.

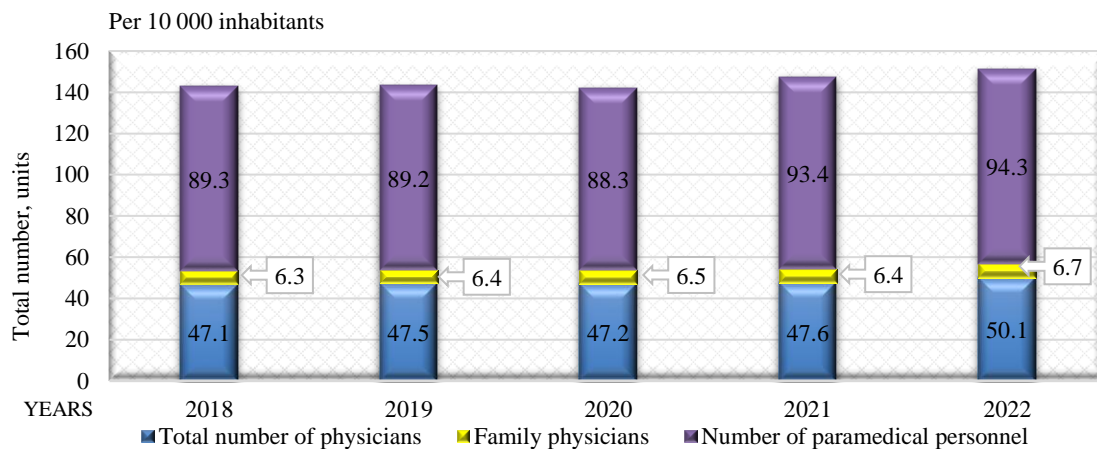


Figure 5. Medical staffing of health care institutions in the Republic of Moldova in 2018-2022

Source: compiled by the authors based on statistical data of the National Bureau of Statistics of the Republic of Moldova

This is due to the implementation of European medical practices in the Republic of Moldova and the addition of qualified staff to provide high quality medical services. The

emergence of private medical centers in the Republic of Moldova is increasing and it is necessary to supplement them with qualified staff as well.

At the same time in the Transnistrian region (figure 6), there is a constant decrease in the total number of doctors, so in 2022 we observe a decrease of 12% compared to 2018. This is due to the process of optimizing the number of doctors in the health sector, which includes the reduction of staff in hospitals. In the Transnistrian region there are also private medical centers offering diagnostic services, treatments and surgical operations as needed.

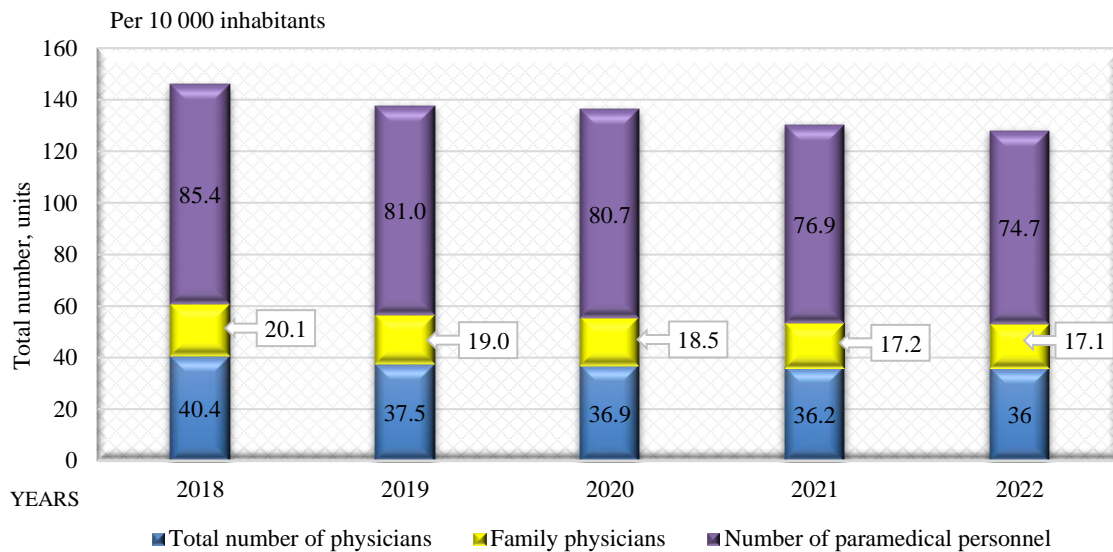


Figure 6. Medical staffing of health care institutions in the Transnistrian region in 2018-2022

Source: compiled by the authors based on statistical data of the Ministry of Health of the Transnistrian Moldovan Republic

Another indicator analyzed in the research paper is the level of illness in the Republic of Moldova versus the Transnistrian region. According to Figure 7, the dynamics of this indicator in the Republic of Moldova is increasing by % in 2022 compared to 2018. The decrease in the year 2020 shows efficient management during the pandemic period and registered a steady increase until the year 2020.

At the same time in the Transnistrian region, this indicator registered a fluctuation in 2019, after which it decreased by % in 2020 compared to 2019 and remained constant until 2020, registering a decrease of % compared to 2018.

Requests for emergency medical, which also serves as an indicator of the level of health and well-being of the population (figure 8). Although this indicator includes not only emergency calls at home, but also emergency calls in case of road accidents, its fluctuations also show the effort made by the state to improve the living conditions of the population.

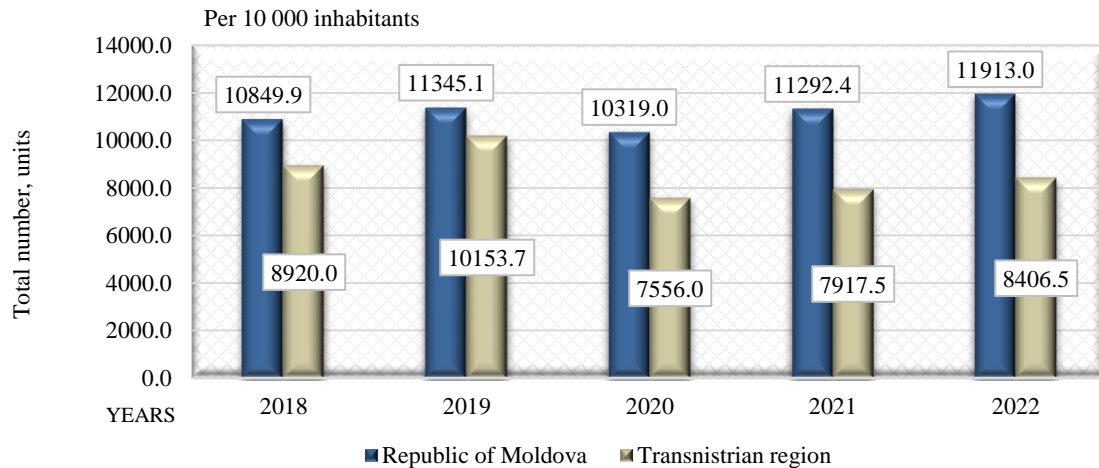


Figure 7. Population morbidity in the Republic of Moldova versus Transnistrian region in 2018-2022

Source: compiled by the authors based on statistical data of the National Agency for Public Health, Ministry of Health

Thus, in the Republic of Moldova this indicator is increasing by about 7% in 2022 compared to 2018, marking a significant increase of 16.9% in 2020 and 21.9% in 2021.

At the same time, in the Transnistrian region, we can observe an insignificant fluctuation in 2019 and a constant decrease since the same year, thus marking a decrease of 2.1% in 2022 compared to 2018. Coronavirus in 2019, which invaded the world, had a more severe impact in the Republic of Moldova than in the Transnistrian region.

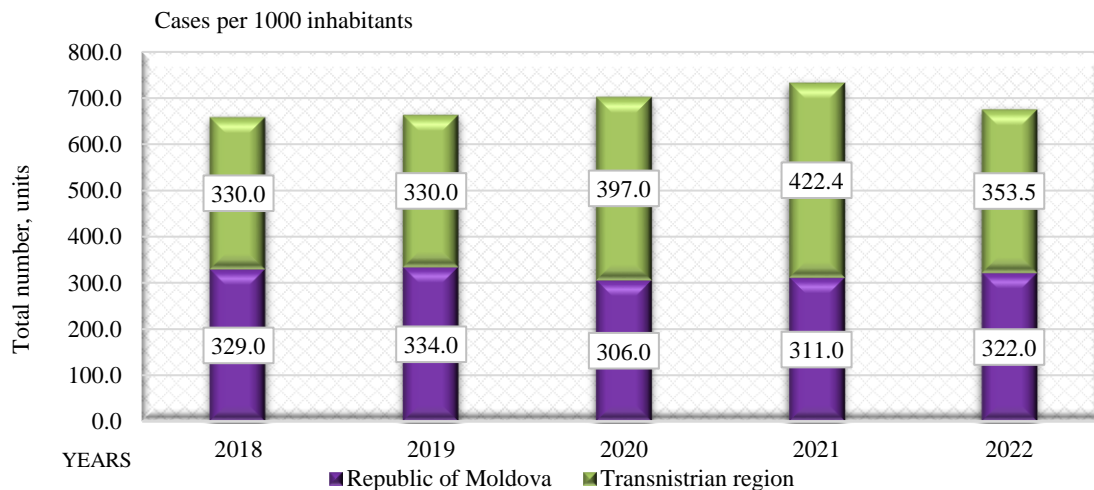


Figure 8. Requests for emergency care in the Republic of Moldova versus Transnistrian region in 2018-2022

Source: compiled by the authors based on statistical data of the Ministry of Health of Transnistrian region

Further, the authors set out to analyze the digital technologies implemented in medicine and the prospects of integrating technological solutions in the field of healthcare in the Republic of Moldova and the Transnistrian region (Table 1).

From the perspective of the country as an example with good digitization practices, both the Republic of Moldova and the Transnistrian region are following the Swiss country-level digitization model.

In the Republic of Moldova, the support of technological innovations to improve the health system is supported both by NGOs (non-governmental organization) funding support and by funding from the country's government. The European and local practices for implementing innovations in medicine were presented at the annual conferences, which aim to accelerate the sustainable development of the digital health system.

At the same time, in the Transnistrian region, in 2022, a "Health Train" pilot project was implemented, which took place in rural areas. A medical team (cardiologist, obstetrician-gynecologist, neurologist, ophthalmologist, and therapist) traveled to the outpatient clinics in the villages, according to the schedule, to cover a larger territory of medical assistance, which is a more effective element in focusing on the lack of specialists in the health sector.

Table 1. Digital technologies implemented in healthcare sector

Country	Republic of Moldova	Transnistrian region
The body responsible for the development of the digitization strategy	The electronic government Agency	Ministry of Digital Development
Country of reference by model	Estonia	Estonia
Pilot projects for digitization of medicine implemented	E-medical system	The health train
	E-sanatate	
Electronic Patient Register	Partially implemented	Partially implemented
Digital Inovations		
Platform	Respiro.md – mental therapy	UE-CFM
	Doctor Chat – redefines access to medical consultations	
Start-up	Baby Medy - real-time clinical temperature monitoring, which smartthermometer devices offer	-
App	Self talk – personal therapist in mental therapy	-
Programs developed in the perspective of implementation	-	Medical mode based on the Atlas program

Source: Developed by the authors based on empirical data

Also, there are various training courses for trainers in Transnistria that retrain staff in "family medicine", organized by the EU-CFM Health Platform team. The event is part of the "Platform in the field of health" project, implemented by the NGO "Association for

health and sport" from Tiraspol, together with the NGO Association of women and children "NOVA" from Chisinau.

In perspective, the implementation of a medical module based on the Atlas program, developed by the Ministry of Internal Affairs of Transnistria, is expected. The implementation of this medical module will record on the electronic platform the patient's transition starting from the request for emergency medical assistance, with the necessary and mandatory tests up to the stage of admission and/or treatment prescription. The program will be implemented first in Tiraspol.

Discussions and findings

Digitisation and healthcare are two major priorities which, when applied to the issue of tackling the effects of the pandemic Covid-19, force us to think about how to create a good resilience structure in the health sector. The authors believe that it is appropriate to introduce international standards in this area, adapt them and work closely with international development partners who are interested and prepared for various future force majeure events in the context of pandemics.

According to the authors, the implementation of the 2025 Health Reform Concept, proposed at the 2019 Medical Forum, is determined by management factors. The introduction of new digitization technologies in medicine manifests itself as an opportunity to benefit and increase work productivity and the quality of medical services..

In terms of efficiency, the authors share the view that the ultimate goal of e-Health is to shift the focus of care from a doctor- and hospital-centered algorithm to a focus group on the patient and the use of digital health technologies. This is reflected in the *Methodology for using digital systems to simplify patient data into a single electronic health record* that can be accessed by different health professionals or for using prescriptions to provide patient mobility for easier access to prescribed drugs, etc.

E-health also means the use of modern technologies, such as artificial intelligence (AI) or Big Data software, to support disease prevention policies by identifying potential anomalies or risks in data and, as a result, adjusting the disease diagnosis. Professor H. Martins, global expert on digital health and WHO expert, states that "the future of healthcare is interdependent with the digitization of processes and provides an insight into the future opportunities as well as the challenges and consequences of realizing the full potential of digital technology in healthcare" Costru et al. (2022). Objective indicators that prove the positive changes due to the digitization of processes in the field of health: health status (increased longevity of the population) and the increase in the quality of health services.

The authors of the article point out that Big Data resources are becoming more and more available every day. "Public administration, industry, medicine, retail, social networks,

banking and the Internet of Things - in these and other fields a huge amount of information appears every day. But conventional software is not capable of analyzing this volume of data. that's why machine learning deals with terabytes and zettabytes of information. The new ability to analyze such matrices affects many areas of life, including business, healthcare, communication and entertainment" Kaushan et al. (2022).

The activities necessary to improve the mechanisms and tools for coordination, implementation and evaluation of the national digital development policy must be carried out at several levels.

Budget execution, as a factor of influence, consists of two main operations: hiring and payment. Regarding the commitment of payments to finance the health system (table 2).

Tabelul 1. Comparațiile metodelor de finanțare a sistemelor de sănătate Semashko și Bismark

Country	Transnistrian region	Republic of Moldova
Type of health system	Semashko	Bismark
1.State guarantee program	Partially de facto, (required full)	Completely
2. Insurance	Social	Mandatory
3.Waiting time	Increased	Decreased
4. Co-payments (Contributions)	Installments	Partially
5. Quality and availability of medical services	Low and medium	High

Source: Developed by the authors based on the researched documents

It is suggested by the authors that health care spending should be viewed as an investment, because it contributes to the health of the workforce and supports their ability to work. Medical outcomes more often refer to specific patient outcomes, while social outcomes refer to public health indicators.

In general, it can be said that digitalization in Transnistria is not an exception. The existing health system is at an early stage of digital development. At the same time, this process contributes to the increase in costs for the development of medical care due to the training of personnel, the purchase of new innovative equipment for the introduction of new diagnostic and research methods and, as a result, obtaining an accurate diagnosis and applying the correct treatment methods. The therapy selection algorithm plays an important role in managing disease treatment and improving the quality of health services.

It should be noted that the systematic approach of the current governments regarding the concept of digitization and the coordination of this process is at a high level, which can create "synergies between the programmers of funding research and innovation to support the implementation for all sectors of the economy of local authorities in Transnistria, in the framework of the smart specialization approach, where NGOs are operators of innovative public-private partnerships of digital projects expected by society" PÉREZ & al. (2014).

Conclusions

Thanks to IT tools, the negative economic and social impact of the pandemic has been mitigated, allowing a relative stability and economic sustainability of health services, which will allow a transformation towards the development of a sustainable economic performance in the field of health, which will lead to a better quality of life in the future. The disproportion of medical assistance in urban and rural areas is greatly increased, a fact that requires a very serious approach and as close as possible to the patient. The pilot projects implemented both in the Republic of Moldova and in the Transnistrian region represent opportunities in the development of medical digital platforms/modules that would cover the population's need to receive qualified medical assistance. At the same time, the gaps are identified and taken into account in the future in the development of the strategic plan for the development of the medical system at the national level.

As a benefit, the information technologies applied in the medical sector have highlighted the patient-centered hypothesis. After conducting the research study, the authors found that in the Transnistrian region the main situation of stagnation in the implementation of digital technologies is recorded the distribution of contributions and the long time needed for the implementation of new innovative technologies. Optimization in the medical sector also represents a factor of stagnation in the development and strengthening of the health system. The financial sources distributed for the health system are insufficient and the process of implementing innovations takes place more slowly than in the Republic of Moldova. Attracting foreign investments would partially solve the stagnation problem, because despite the fact that Transnistria has an uninsured medical model, and the possibilities in cases of complicated interventions are lacking, the government allocates financial resources annually for people who require interventions with a high degree of complexity abroad. However, the authors express their opinion regarding the consolidation of the public health system through the prism of digitalization in the Transnistrian region as an option that requires experience and will take place over time. In the context of implementing the new elements of digitisation, new thinking is required from all actors and partnerships in the health system.

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SUSTAINABILITY FROM CONCEPT TO PARADIGM OF ENVIRONMENTAL POLICIES

Adela Sorinela SAFTA*¹

Lavinia POPESCU*²

Abstract: *This paper analyzes by transposing the importance of environmental policies, highlighting the most significant regulations directly related to the sustainable agriculture component in relation to the environmental targets proposed by the Municipal Agricultural Policy. The need to rethink agricultural processes led slowly to the anchoring to current trends as a premise in the realization of a real report related to sustainable agricultural systems performing and last but not least aligned to the constraints of eco-conditionality. From this perspective, the methodology in reflecting our analysis was linked to the collection of data reported in international statistical databases such as those available at the National Institute of Statistics Eurostat, as well as OECD reports on the subjects analyzed in the study. In these paradises, the perspective reflected by the New Agricultural Policy is rather aligned towards the achievement of environmental goals in agriculture, which positions the ability of farmers to adapt to these sustainability conditions. Through these completely new concepts for farmers, the studio reflects the sustainability of agriculture through the levers offered by the agricultural policy and research, thus also representing an important resource in complex research aimed at the decarbonization of agriculture as topical issues.*

Keywords: *environmental, sustainability, agricultural, decarbonization, policies.*

UDC: 631.147:504.75

JEL Code: Q10, Q01, Q10, Q59, Q18.

Introduction

A key tool for guaranteeing that agriculture can make a workable transition to a sustainable future—one that includes achieving the objective of lowering carbon emissions has been identified as the Common Agricultural Policy's (CAP) views.

One of the main objectives of the paper is the interconnectivity between how specific agricultural activities can be answers for the protection of biodiversity. From this perspective, the second objective that we aimed to highlight is related to productivity and good practices, how ecosystem services can influence the reduction of greenhouse gas (GHG) emissions. The paradigm of how agriculture contributes directly to the production of greenhouse gas emissions is analyzed in contrast to the role of agricultural processes as a whole, mainly through carbon

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sequestration at soil level. Thus, surprisingly, few studies have investigated the cause-effect relationship as an objective of integrated analysis based on regionally aggregated data, but many studies have demonstrated contrasting patterns in outcomes and environmental outcomes as revealed by Raudsepp- Hearne et al. (2010).

The main purpose of this research is to study the evolution of Romanian agriculture in the context of the new transformation of the common agricultural policy paradigm from the perspective of sectoral structural constraints determined by a new vision of the Common Agricultural Policy, this being generally perceived as a new requirement.

Linking specific agricultural activities to responses in biodiversity, ecosystem services and emissions, including greenhouse gas (GHG) emissions are directly causal, and surprisingly, few studies have investigated such changes in an integrated analysis. based on regionally aggregated data demonstrated contrasting patterns in environmental outcomes and output (e.g. Raudsepp-Hearne et al. (2010)).

As a result, climate targets have been discovered in the CAP. Academic research has raised widespread concerns about achieving the goal of reducing carbon emissions from the perspective of sustainable agriculture, as well as how agricultural economies are evolving from a climate perspective has sparked a number of debates.

In order to create a causal relationship from a climatic perspective, we summarized in our paper the changes in carbon emissions from agricultural sources in Eastern countries as compared to the European Union. We also emphasized certain concerns regarding agricultural fertilizers.

Most recent research on ecosystem service provision at the landscape scale has concentrated on offering packages of services for administrative regions, grouped areas, or special locations (Andersson et al., 2015; Nikodinoska et al., 2018). To our knowledge, there is a lack of studies that explicitly link changes in biodiversity and ecosystem services to the increasing specialization of production, despite the fact that the latter is an important link between agricultural policy and environmental outcomes (Leventon et al. al., 2017). Nikodinoska et al., 2018). To our knowledge, there is a lack of studies that explicitly link changes in biodiversity and ecosystem services to the increasing specialization of production, despite the fact that the latter is an important link between agricultural policy and environmental outcomes (Leventon et al. al., 2017). Nikodinoska et al., 2018). To our knowledge, there is a lack of studies that explicitly link changes in biodiversity and ecosystem services to the increasing specialization of production, despite the fact that the latter is an important link between agricultural policy and environmental outcomes (Leventon et al. al., 2017).

From an environmental perspective, policies are expected to change relative profitability, especially in the organic farming sector (Sanders, 2007) thus benefiting the gross domestic product of agriculture with the ancillary components shown in Table 1.

Table 1. Total GPA products from agriculture

unit	2015	2016	2017	2018	2019
Total GPA products	2817995372	2997112627	2806353995	2757774900	2635106003
Agricultural products, hunting and related services	57903413	59636519	57700564	57190913	55741202
Forest products, logging and related services	2894263	2313464	2792079	2761014	2629423
Fish and other fishery products, aquaculture production	4648586	5770344	5472822	5331782	5236907
Legal and accounting services	4940446	4648812	5617627	5561279	5362229

Source: own searched data from Eurostat

Another atypical problem is the revenues from the state budget are calculated from royalties from the exploitation of agricultural land, which shows that there is a practice of removing these lands from the agricultural circuit, which leads to the limitation of seizure of C in the soil, and teen conversion opportunities for farming practices.

Climate change can also have a positive impact on agriculture. Warmer temperatures, according to some research, prolong the growing season and increase the carbon dioxide in the air, which leads to increased yields in some crops. A change in production practices patterns, as well as a growing demand for irrigation, may be due to global warming and declining soil moisture.

The ability of agriculture to benefit from climate change will be influenced by adaptation to cross-compliance mechanisms the mechanisms of unconditionality and the transition to organic production.

Data and Methodology

A variety of approaches are used in this strategy, which includes collecting and analyzing administrative data in addition to evaluating the literature. Allocating CAP money, mainly for the substitution of agricultural policy mechanisms for pesticides, required a comprehensive analysis of databases as part of the process. Utilizing a cross-cutting technique, the literature review for finishing the responses to the evaluation questions and conducting the early context analysis. Beginning with the data pertaining to Romanian farms and agricultural goods, a number of specialized analyses including those on fertilizers, climate change, biodiversity, and much more that were found in the literature were taken into consideration first.

A global context analysis and a summary of the most pertinent research relevant to agricultural regions with ecological practices on the one hand and land use that have served as benchmarks for a more thorough examination of the context of greenhouse gas emissions are

also included in the literature review. We examined an evaluation of the counterfactual influence in the applicable methodological analysis, wherein, if there would be enough causal elements between them, it would be beneficial to access and correlate the particular microdata gathered from the statistical databases.

The data collection tools were based on the usefulness of the data compared to the date of accessing the data sources being collected from specific annual statistical reports as well as from administrative data sources Eurostat, Agridata as well as Organization for Economic Cooperation and Development (OECD).

The results show that sustainable agriculture has become more and more important, being a topic included in the Common Agricultural Policy and more and more common among academic research.

The main element pursued in the data collection of this research is to make a synoptic analysis of the evolution of agriculture in the context of transformations as a result of the application of agricultural policies from the perspective of changes, and in this direction there are many restrictions that lead to results sometimes affected by the inability of rural areas to adapt to environmental policies even because of environmentally affected areas such as excessive deforestation, landslides and soil degradation.

The Common Agricultural Policy thus foresees a transfer of funds from the first pillar (market) to the second development pillar (rural) of the CAP, through modulation, thus providing incentives for the expansion and increased adoption of sustainable and ecological production techniques. The additional funding proposed for rural development plans could benefit from carbon sequestration, if member states invest it in increased soil protection measures our analysis consisting of extracting Eurostat statistical data by estimating the capacity to adapt agricultural practices in general to the norms and policies for the protection of biodiversity and the environment.

Romania is facing a huge problem in balancing economic development with environmental sustainability. Romania has made huge strides in improving the conditions of systemic development since the application of agricultural policies as a result of joining the EU. living conditions since joining the EU.

A faster pace of economic growth, on the other hand, should help close the gap with the EU average. At the same time, Romania, like the rest of the EU, faces effects regarding the application of agricultural policies as a result of climate change and environmental damage. At the same time, Romania, like the rest of the EU, is facing climate change and environmental damage.

The Model and Findings

In the context of the European legislation on combating climate change and the transition to the Green Pact, the aim is to increase the level of the emission reduction target.

In this context, the CAP has several dimensions: financial support and market-oriented dimension and rural development dimension.

In Romania is one of the countries that practices organic farming. In the period 2012-2019, the area in organic farming decreased by an average of 6,939.7 hectares per year.

Along the food supply chain, farmers and operators will have more alternatives as we move toward sustainable food systems, particularly with organic farms. This will lead to better food and cheaper environmental expenses. Regions of the EU that produce crops often have predetermined amounts of soil phosphorus.

Organic pricing and the influence of the stimulus market are frequently more expensive than aid payments (Offermann and Nieberg, 2009). For example, the CAP strategy has resulted in a notable decrease in traditional ones. Producer pricing have made organic farming more competitive when combined with EC subsidies for organic farming under Regulation 2078/92.

According to Eurostat public information, we estimated by Figure 1 the projection of economic indicators as the target on the Agricola forecast, a progressive increase resulted, starting with 22% in 2023 and reaching 25% in 2025.

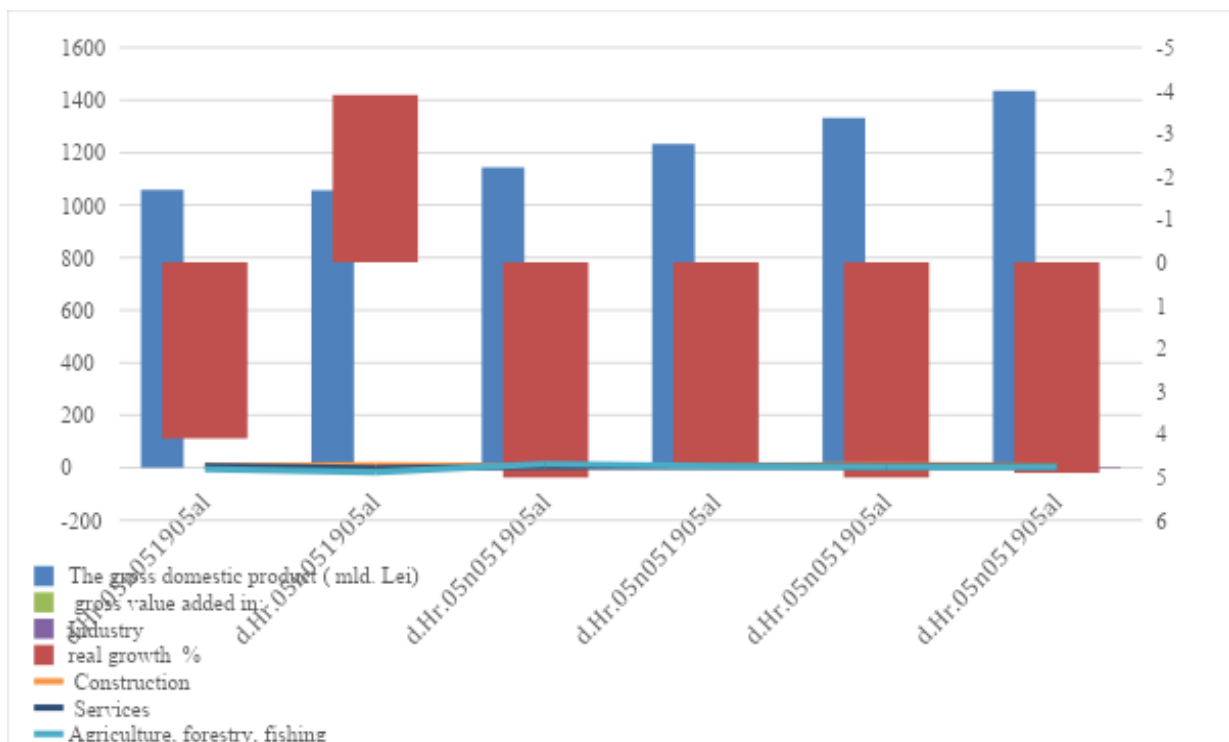


Figure 1. Projection of the main macroeconomic indicators

Source: www.insse.ro (Own research data from National Institute of Forecasting)

Table 2. Title of the table (Times New Roman, 12 pt., bold, left)

Country/year	2002	2007	2012	2017	Population for 2018, million
Bulgaria	-85500	-83742	-24472	-24001	7024216
Czech Republic	47402	250889	59997	59997	10625695
Estonia	-18406	-15151	-10516	-4999	1320884
Hungary	61589	25150	29999	29999	9768785

Source: World Bank <http://www.worldbank.org>

Information in the In the context of agriculture, carbon sequestration is the process by which forests and agricultural land absorb carbon dioxide from the atmosphere. Through photosynthesis, carbon dioxide is taken up by plants, trees, and crops. It is then stored as carbon in biomass found in the roots, trunks, branches, leaves, and soil of these organisms (EPA, 2008). Because they can hold significant amounts of carbon in plants and their root systems for extended periods of time, forests and stables are known as carbon reservoirs. The world's soils are the greatest absorbers of terrestrial carbon. The climate, the type of soil, the type of cover and the management of crops or practical vegetation all influence the potential of agricultural land to store or capture carbon.

The addition of carbon from dead plant material and the loss of carbon by respiration, the decomposition of the process and the disturbance of both natural and human soil influence the amount of carbon stored in the organic materials of the soil.

Organically farmed lands and areas undergoing conversion in Romania must fulfill all production requirements specified in Regulation (EC) no. 834/2007. The specific guidelines for implementation are specified in Regulation (EC) no. Commission Regulation (EC) No 889/2008.

Pesticides affect more than only agriculture; for example, they may be spread through the air and leave residues in food. One of the main reasons why poultry numbers have decreased throughout Europe is the indirect impacts of pesticides (Geiger, et al. 2010). Nevertheless, these approximations primarily establish the foundation for the requirement to lower external adaptation costs by highlighting their large amplitude. It should be highlighted that the amount of pesticides sold and used is highly erratic and is influenced by a number of variables, including crop composition, farming methods, crop prices, input costs, and the likelihood of new regulations that might encourage pesticide hoarding.

Furthermore, the degree of danger and effect associated with the use and sale of pesticides is not equivalent to these figures, which do not account for the characteristics of the chemical used. The fact that funds are not being allocated to green initiatives in an effective manner is the most noteworthy feature of the way that climate policy expenditure is currently calculated.

Lynch et al. (2021) also highlight the critical role that agriculture plays in mitigating climate change, emphasizing the intimate relationship between mitigation capability and tactics.

Over the past 20 years, the importance of climate objectives in the CAP has steadily increased. This section explains the evolution of the CAP's integration of climate issues. Prior to 2007, the CAP had not declared climate action as a top priority.

Nonetheless, some instruments and policies that have been put in place may have some impact on mitigating the effects of climate change. For instance, intense output was discouraged in 2003 when decoupled direct payments were implemented.

The evaluation of carbon storage and land use strategies in functional and competitive market economies has become increasingly visible in scientific research, paving the way for a new era of less polluting agricultural development, with very ambitious decarbonisation objectives. 40% by 2030, as amended by the agreement on the European Climate Law of April 2021 establishing a framework for climate action to increase societal certainty, the date on which the EU's 2030 ambition is also growing,

In conclusion, the European Commission's priorities in the European Green Pact are to implement the commitment to the United Nations Convention on Climate Change and to implement the Green Climate Change operational.

In recent decades, agricultural intensification methods have contributed to higher yields. In light of the CAP's greening strategy, this has had significant effects on how agricultural producers behave ecologically and how to create an agri-food business that is more ecologically conscious.

Regarding the attraction, support and development of small farms in mountain areas is similar to that recorded in other parts of the country, with 2.78 hectares supported on average in projects in mountain areas and 2.32 ha / projects outside mountain areas in the mountain area, most beneficiaries own small farms., while most of the funding is accessed by large farms. In fact, 60% of the beneficiaries of subsidies in the mountain area own a farm of less than 50 ha.

The value of investments in farms with less than 50 ha represents 27% of the total financing in the mountain areas and only 3% of the total financing on the entire Romanian territory.

The data analysis indicates that small farms tend to be flexible and diversify in response to market demands, as they are not highly specialized in any one area. This self-consumptive tendency is reflected in their ability to adapt to changing environmental conditions without the practical encouragement of agri-environmental measures. Reducing energy consumption or reducing nitrate emissions (Table 2).

For developing countries such as Romania and Bulgaria, both pillars of the CAP are critical for agriculture, but with an emphasis on the first pillar. Compared to countries like Germany or France where ecological policies have been adapted to market requirements, we cannot help but make a clear distinction of the fact that not in all cases the agricultural policy takes precedence, but it is influenced by factors such as local culture, the low degree of

adaptability through lack of sustainability information and more environmentally friendly farming practices, as he notes Safta A.S. et al (2024)

Table 2. Models for reducing nitrate emissions

United	Development tools goals
Reducing GHG emissions	Absolute reduction in time of GHG emissions in agriculture *, at farm or area level (unit: CO2 equivalent) Reduction of greenhouse gas emissions from agricultural activities relative to production farms
Sustainable, tangible and intangible investments Ensuring healthy organic agricultural products	Increasing efficiency in the production process at farm or area level (unit: energy per unit of product / hectare, emissions per unit of product / hectare) Efficient management of natural resources and maintaining a reduced impact of agriculture on natural resources (water, soil, air)
Sustainable, tangible and intangible investments Maintaining a good conservation status of biodiversity preserving areas of high natural value	Introduction of ecological technologies, standards or ecological practices in agricultural processes Preservation of the characteristics of rural areas and natural landscapes.
Land management Agricultural land management capacity	Changing land use patterns (towards sustainable land use) at the level of agricultural land (unit: hectare) Conversion of agricultural land to improve soil carbon sequestration

Source: Eurostat data owner recherche <http://www.worldbank.org>

In this vision, the access to the funds offered through the Agricultural Policies differed in the EU countries, from which it follows that the measures supported by the CAP must be constantly updated according to the needs of farmers and according to the market situation at different times.

Adopted measures should be taken to close the existing gaps with the other countries, especially in the north-west EU (Galluzzo (2018) demonstrated the existence of a direct correlation between Single Area Payment Schemes and crop specialization.

Conclusions

Taking into account all the highlighted agricultural productivity pursued by agricultural policies in intense change, it can be observed that agricultural productivity is not directly related to the expenses related to the direct payments applied through the CAP, nor to the agricultural area used, respectively the coverage of agricultural land. Mitigating efforts towards the convergence of labor productivity in the EU-27 depends on factors such as: the promotion of precision agriculture, knowledge transfer and others.

However, the volume of direct payment expenditure must be considered differently in less productive countries, mainly because a large share of the total population relies on subsistence agriculture. In this context, the allocation of the CAP budget becomes difficult to estimate. One of the components of the first pillar of the CAP is intended to provide additional support for compensating the costs of applying good practices and greening agriculture.

There is a good probability that agricultural systems will adjust to these demands thanks to the EU's right to include resource-efficient sustainability measures and remediation strategies into the Common Agricultural Policy. Furthermore, considering the current state of the climate and the emphasis on sustainability being built upon the three main pillars of economic, environmental, and social sustainability, we believe that any interference between these poles needs to be described as a living interdependence rather than at the level of a general strategy.

According to Popescu et al. (2021), the environmental benefits of such allocations will be reduced even from the initial costs. Therefore, our analysis suggests that in the first phase, since pollution levels could be controlled by measures to reduce pesticides and replace chemical fertilizers by switching to sustainable products and production, why not reduce these costs?

On the other hand, in the current circumstances, the interconditionality between benefits and costs must be kept in balance when achieving the objectives is to reduce pollution. We believe that the interference between them must be outlined as a living interdependence between the poles and not at the level of a generic strategy.

Research shows that the impact of environmental degradation tends to be concentrated among vulnerable groups and households. Air pollution by analyzing the consequences creates the premises for synergies related to activities at regional and rural level as many farmers are attracted to environmental protection programs. (Ramírez, P.B., et al colab. (2019)

Several pertinent studies have evaluated land use emissions using IPCC approaches in terms of greenhouse gas emissions from land use (Flynn et al., 2012; Don et al., 2012). According to Don et al. (2012), the lack of data makes it difficult to estimate the balance of GHG emissions for bioenergy crops. Additionally, annual energy crops like maize, wheat, and barley have low GHG efficiency because the production of raw materials compromises the CO₂ savings associated with bioenergy. They suggested a revision of the plan to lower GHG emissions by better selecting the type of culture, increasing yield, and implementing improved culture management—exactly because there were insufficient information resources available (Nancu et al., 2022).

Concluding with the reduction of land use emissions is no longer an option, but a necessity in terms of contributing significantly to climate change. An image with direct answers to the negative impact of land use on air concentration as a result of incorrect land management, used crops, land conversion through changes in use on the one hand but also the size of organic farming and reduction of chemical fertilizers and pesticides in agricultural production. but a need in terms of contributing significantly to climate change. An image with direct answers to the negative impact

of land use on air concentration as a result of incorrect land management, used crops, land conversion through changes in use on the one hand but also the size of organic farming and reduction of chemical fertilizers and pesticides in agricultural production. but a need in terms of contributing significantly to climate change. An image with direct answers to the negative impact of land use on air concentration as a result of incorrect land management, used crops, land conversion through changes in use on the one hand but also the size of organic farming and reduction of chemical fertilizers and pesticides in agricultural production.

Sustainable development strategies and options should evolve in relation to scientific research on sensitive issues of reducing greenhouse gas emissions, how agricultural sustainability and the state of land use emissions are evolving through sustainable land management. In recent years, Sustainable land management has grown in importance as a strategic objective for the EU and other organizations in recent years. Decision-makers need to be aware of what is going wrong and the effects that every land use choice has in order to manage the land more effectively. Greenhouse gas emissions are a worldwide phenomenon that have catastrophic impacts on the earth when it comes to the negative effects of land usage.

Therefore, in accordance with environmental requirements, farmers can benefit from funds allocated through levers adopted in EU regulations, bringing a benefit in reducing pollution through pesticide reduction measures and the replacement of chemical fertilizers, by switching to sustainable products and productions. By adapting faster to the measure of cross compliance, environmental costs, as indicated by Popescu et al. (2021) will be reduced even compared to the initial costs. Thus, it is once again shown that the CAP package places a high priority on alignment with environmental circumstances and transfers complete responsibility for environmental compliance to farmers. Setting goals for the effectiveness of an increasingly sustainable agriculture takes the needs of the environment and climate change into account.

Our findings demonstrate that no one farm model can minimize greenhouse gas emissions while maximizing food production, pasture biodiversity, and landscape openness. Nonetheless, there is a great deal of room to control trade-offs between these environmental factors and food production.

The study shows that raising sustainability targets is not only a requirement for agriculture policy but also a lever for efficiency; the convergence levers of the CAP vision transform necessity into reality. Consequently, it is imperative that an innovative framework be in place to assist producers in utilizing those levers and tailored solutions as they shift to more environmentally friendly business practices. Sustainable development of agricultural crops represents an important way to analyze the opportunities for decarbonisation and to promote climate-friendly principles in agriculture.

This research paper contributes to an explicit understanding of the CAP issues as a specific policy with a high impact on the Romanian agricultural system and the development of the rural community. We can say that the way in which research and innovation contribute

through its influence to the development of constructive policies in the wider European Union can lead to the involvement of civil society, of all interested parties in the adoption of the best practices that provide a balance between environmental standards and long-term sustainability. PAC therefore aims to provide food security for EU citizens, but in a complex way that ensures sustainability. Therefore, the contribution of this study also consists in highlighting major issues related to the effects of the evolution of the common agricultural policy on Romanian agriculture in terms of accelerating good practices and sustainability policies.

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FINANCING JUSTICE FOR SUSTAINABLE DEVELOPMENT IN MOLDOVA

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Abstract: *This paper provides a comprehensive analysis of the challenges and advancements in Moldova's justice system reform, particularly in the context of achieving Sustainable Development Goals (SDGs). It delves into the pivotal role of the Moldovan justice system in governance and societal well-being, highlighting how its efficiency, transparency, and accessibility are essential for democracy, reducing corruption, and building public trust. The paper examines Moldova's ongoing struggles with judicial independence, corruption, and resource limitations, exacerbated by its post-Soviet transition and the need for alignment with European standards. The relevance of SDG 16, which focuses on promoting peaceful and inclusive societies, access to justice, and building effective institutions, is underscored as a key framework for Moldova's judicial reforms. The paper argues that aligning Moldova's justice system with SDG 16 is not only strategically necessary but also an ethical obligation. Improving the judicial system could lead to significant advancements in reducing corruption, enhancing public trust, and creating a stable legal environment conducive to economic growth and societal well-being. The paper also highlights the well-established link between an effective justice system and broader sustainable development goals in the literature. It includes a thorough literature review, analysis of justice financing in relation to SDGs, a discussion of Moldova's specific challenges, and concludes with policy recommendations and future research directions. This exploration aims to provide a nuanced understanding of Moldova's justice system reforms and their critical role in the nation's journey towards sustainable development.*

Keywords: *Justice financing, Sustainable Development Goals, Moldova.*

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JEL Code: H76, P48, O11.

Introduction

The Republic of Moldova, transitioning from its Soviet past, is in the midst of an ongoing journey to reform its justice system (McLauchlan, 2018). This paper aims to explore the intricacies and challenges of this journey, particularly in the context of governance, societal well-being, and the pursuit of Sustainable Development Goals (SDGs). Moldova's justice system is a pivotal element in the nation's democratic quality, the level of corruption, and the general trust of its citizens in state institutions. These aspects are crucial not only for internal stability and development but also for Moldova's international relations, especially regarding European integration aspirations (Minzarari, 2022).

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Moldova's justice system shares common issues with other post-Soviet countries, such as challenges in judicial independence, persistent corruption, and general inefficiency. Efforts led by the European Union have played a significant role in propelling reforms, especially in the judiciary and anti-corruption frameworks (Delegation of the European Union to the Republic of Moldova, 2023). Despite these efforts, the system continues to grapple with political influence and public mistrust, with the independence of the judiciary being particularly compromised (Freedom House, 2021). A lack of resources further exacerbates these issues, affecting everything from the infrastructure of court buildings to the professional development of legal practitioners.

This paper highlights the relevance of SDG 16 in the Moldovan context. SDG 16, aimed at promoting peaceful, inclusive societies, access to justice for all, and building effective, accountable, and inclusive institutions, is integral to sustainable development (Bexell & Jönsson, 2017). This goal emphasizes the importance of the rule of law and equitable access to justice as fundamental pillars of sustainable development.

The paper argues that aligning Moldova's judicial reforms with SDG 16 is both a strategic necessity and an ethical obligation. Improving the judicial system could lead to significant progress in reducing corruption, bolstering public trust in government, and fostering a stable and predictable legal environment conducive to business and investment. Such advancements are crucial for economic development and societal well-being, as they ensure rights protection, fair legal treatment, and foster a sense of justice within the community.

The relationship between an effective justice system and broader sustainable development goals is well-documented in the literature. For instance, the World Bank's research illustrates how legal and judicial reforms can impact economic and social outcomes by providing a stable and predictable framework for resolving disputes (World Bank, 2019a). Similarly, the UNDP highlights the integral role of governance, including the justice system, in the successful achievement of SDGs (Cheema, 2022).

The structure of this paper includes a comprehensive literature review, an analysis of justice financing in the context of SDGs, a discussion of Moldova's specific challenges and needs, and concludes with policy recommendations and areas for future research. Through this exploration, the paper seeks to provide a nuanced understanding of Moldova's justice system reforms and their critical role in the nation's journey towards sustainable development.

Methodology

This study adopts a qualitative research approach, chosen to deeply explore the complex interplay between justice financing and the Sustainable Development Goals (SDGs) within the unique socio-economic and legal context of Moldova. The qualitative methodology is particularly suited for this analysis due to the intricate and multifaceted nature of the subject

matter which involves assessing intricate legal frameworks, financial mechanisms, and sustainable development strategies in a post-Soviet landscape (Mohajan, 2018).

The research design for this study is comprehensive, structured to conduct a systematic review of both scholarly and gray literature. This includes an extensive examination of recent scholarly articles, historical texts that have shaped academic discourse on legal reforms and justice financing, and contemporary reports from credible international bodies like the United Nations and the World Bank. The literature review is designed to encapsulate documents published within the last decade to capture the most current insights, while also integrating seminal works for their foundational perspectives on justice and development.

The data collection encompasses a broad spectrum of documents to ensure a diverse and informed analysis. Scholarly articles from peer-reviewed journals provide theoretical insights and contemporary research findings on justice financing. Additionally, reports from international organizations such as the UN and the EU contribute global standards and benchmarks, which are crucial for contextualizing Moldova's progress against international norms. Policy documents and legal texts are also scrutinized to understand the statutory and regulatory frameworks guiding justice reforms in Moldova. Comparative case studies from countries sharing similar socio-political and economic backgrounds offer practical insights and lessons that could be applicable to Moldova.

The core of the data analysis in this study is thematic analysis, a method well-suited to qualitative research which allows for the identification, analysis, and interpretation of patterns within the data. The process begins with a thorough coding of the data, organizing information into categories that reflect recurring themes pertinent to justice financing and SDGs. These themes are further refined and linked to broader patterns that emerge from the data, aligning closely with the objectives of the research. The final stage involves a detailed interpretation of these themes, aimed at understanding their implications for the legal and economic landscape in Moldova, and how they might influence broader developmental goals.

By employing this detailed methodology, the study ensures a rigorous examination of the intricate dynamics between legal reforms, financial strategies, and sustainable development in Moldova. This approach not only provides a comprehensive analysis of the theoretical and practical aspects of justice financing but also ensures that the findings are relevant and can inform policy recommendations and strategic decisions.

Analysis of Justice Financing and SDGs

The role of justice financing in the achievement of Sustainable Development Goals has garnered increasing attention in global discourse. The realization of these goals, particularly those centered around justice, peace, and strong institutions (SDG 16), is deeply intertwined with how justice systems are financed. A review of global literature reveals several trends, best

practices, and challenges in this area, highlighting the critical role of financial resources in shaping the efficacy of justice systems worldwide.

A major trend observed in global literature is the growing recognition of the justice system as a foundational pillar for achieving sustainable development. The World Development Report 2019 from the World Bank underscores this, asserting that legal and judicial reforms are crucial for conflict resolution, rights protection, and ensuring equality (World Bank, 2019b). Similarly, the United Nations Development Programme emphasizes that effective governance, including a well-functioning justice system, is foundational for the success of all other SDGs (Cheema, 2022).

Best practices in justice financing as identified in the literature revolve around the integration of justice system funding within broader developmental strategies (Fuchs, Hurley, & Minsat, 2011). Allocating resources to the justice sector as part of a holistic approach to development ensures that the justice system's needs are not considered in isolation but are aligned with broader national goals. Another emerging best practice is the adoption of innovative financing mechanisms. For instance, social impact bonds, which align funding with measurable outcomes in justice delivery, have gained traction as a means to enhance efficiency and effectiveness in the sector.

Despite these advancements, several challenges persist in justice financing globally. A key issue is the inconsistency in funding, often attributed to fluctuations in national budgets and priorities. This inconsistency can lead to a lack of stability in justice systems, adversely affecting their ability to deliver fair and timely justice. Another challenge is the struggle to maintain the independence of the justice system from political influences, a factor that is crucial for ensuring impartiality and public trust. Developing countries, in particular, face additional hurdles due to limited resources and institutional weaknesses, which can impede the effective functioning of their justice systems (Goncearenco, 2023a, 2023c; Winkler, Tyler, Keen, & Marquard, 2023).

The impact of justice financing on the achievement of SDGs is profound. Adequate funding is essential not only for the maintenance of law and order but also for ensuring access to justice for all, a key component of SDG 16. A well-financed justice system contributes to the creation of stable, predictable, and transparent legal environments, which are essential for economic growth, social equity, and the protection of human rights. Furthermore, the equitable distribution of justice resources can help address systemic inequalities, thereby contributing to the achievement of other SDGs, such as those aimed at reducing poverty (SDG 1), promoting gender equality (SDG 5), and fostering peaceful societies (SDG 16).

In the context of Moldova and similar post-Soviet states, the financing of the justice system is a complex issue that intertwines with broader socio-economic and political reforms (Goncearenco, 2023c). Post-Soviet countries have undergone significant transformations since the dissolution of the Soviet Union, and these changes have profoundly impacted their justice

systems. The literature specific to Moldova and its counterparts reveals the evolution and current state of justice financing in these transitioning democracies.

Moldova, like other post-Soviet states, inherited a justice system deeply entrenched in Soviet legal traditions, characterized by a lack of independence and transparency. The transition period post-1991 was marked by efforts to reform these systems to align with democratic and European standards. This transformation required substantial changes in legal frameworks, institutional structures, and importantly, in the financing of the justice system.

According to studies by the European Commission and other EU documents, substantial aid and guidance have been provided to Moldova and similar states to aid in their justice reform processes, including financing (European Commission, 2020b). These efforts were aimed at establishing a justice system that was independent, efficient, and accessible, principles that are foundational to a functioning democracy.

In recent years, Moldova has made strides in reforming its justice system, though challenges remain. The current state of justice financing in Moldova is a subject of ongoing concern and debate. Despite increased funding and international support, the system still grapples with issues of efficiency, corruption, and public trust.

A report by Freedom House highlights the continued struggle with corruption within the judiciary and the influence of political and business interests, which undermines the effectiveness of the justice system (European Commission, 2020a). These challenges are further compounded by a lack of consistent and adequate funding, which impacts the ability of the judiciary to function independently and efficiently.

A comparison with other post-Soviet states reveals a similar trajectory in justice system reforms. Many of these countries have faced the challenge of transforming their justice systems in the context of broader political and economic changes. A study on Eastern European judicial reforms highlights the varied approaches and outcomes in these countries, noting that while progress has been made, issues such as political influence, corruption, and inadequate financing remain prevalent (Parau, 2012).

International aid and partnerships have played a significant role in the evolution of justice financing in Moldova and other post-Soviet states. The European Union, in particular, has been a key player, providing both financial support and technical assistance to help these countries align their justice systems with European standards (European Commission, 2020b).

Linking Justice Financing to Specific SDGs

The direct impact of well-funded justice systems on the achievement of specific Sustainable Development Goals, particularly those related to reducing inequality (SDG 10) and promoting gender equality (SDG 5), is a critical area of study in contemporary legal and

developmental literature. A comprehensive review of this literature provides insights into how investments in the justice sector can lead to significant advancements in these key areas.

One of the fundamental ways in which a well-funded justice system contributes to reducing inequality is through ensuring access to justice for all, a core tenet of SDG 10. According to the World Justice Project (World Justice Project, 2019), access to justice is crucial in addressing disparities and ensuring legal protection for marginalized and vulnerable groups. This includes providing legal representation, legal literacy, and services that are accessible to people irrespective of their socio-economic status.

A report by the United Nations Development Programme underscores the role of legal systems in mitigating economic and social inequalities (Conceição, 2019). Effective legal frameworks, supported by adequate financing, can enforce laws that protect workers' rights, regulate fair business practices, and ensure property rights, thereby addressing economic disparities. Additionally, well-resourced legal systems are better equipped to tackle social inequality by providing mechanisms to address grievances and disputes, thus promoting social justice.

The role of the justice system in promoting gender equality, especially in the context of combating gender-based violence, is well-documented. The United Nations highlights the necessity of strong legal frameworks and institutions in preventing and responding to forms of violence against women and girls (United Nations, 2015). Well-financed justice systems are essential for the effective implementation of these legal frameworks, ensuring that survivors of gender-based violence have access to justice and necessary support services.

Furthermore, the literature points out the significance of representation in legal decision-making as a facet of promoting gender equality. A study by the International Development Law Organization (IDLO) emphasizes that gender parity in the judiciary and legal professions contributes to more equitable legal processes and outcomes, thereby advancing gender equality (Logan, 2019).

The indirect impact of an efficient justice system extends beyond its immediate realm, influencing broader societal goals such as economic growth (SDG 8), education quality (SDG 4), and overall societal well-being. This ripple effect is well documented in various studies and reports, which highlight the multifaceted ways in which a well-functioning legal system contributes to these broader Sustainable Development Goals.

The link between an efficient justice system and economic growth is a focal point in development literature. The World Bank's World Development Report (2019) underscores the importance of a reliable legal framework for economic activities. A well-functioning justice system ensures the enforcement of contracts, property rights, and business regulations, which are fundamental to economic stability and growth. This legal certainty is crucial in attracting domestic and foreign investments, fostering entrepreneurial activities, and promoting fair competition (World Bank, 2019b).

Additionally, an effective justice system plays a vital role in the enforcement of labor laws and employment rights. This enforcement is essential for protecting workers, ensuring fair labor practices, and mitigating exploitative working conditions. By upholding labor standards, the justice system indirectly contributes to sustainable economic growth, aligning with the objectives of SDG 8.

The indirect impact of the justice system on education quality, as articulated in SDG 4, is also significant. A report by UNESCO highlights the role of legal frameworks in protecting the right to education. This includes ensuring access to quality education for all children, regardless of their background, and addressing issues such as discrimination and exclusion in educational settings (UNESCO, 2017).

The justice system's role in combating child labor is another critical factor influencing education quality. Effective legal mechanisms deter child labor practices, thereby enabling more children to attend school and receive quality education. This is particularly important in developing countries, where child labor remains a significant barrier to education.

The broader impact of an efficient justice system on societal well-being cannot be overstated. A study by the Organization for Economic Co-operation and Development notes that a reliable legal system enhances social cohesion by upholding the rule of law and protecting individual rights (Teremetskyi et al., 2021). This legal protection contributes to a sense of security and trust among citizens, which is foundational for societal well-being.

Furthermore, an effective justice system plays a crucial role in conflict resolution, preventing disputes from escalating into social unrest. By providing mechanisms for peaceful dispute resolution, the justice system contributes to social stability and harmony, which are essential for the overall well-being of a society.

Case Studies and Comparative Analysis

The exploration of selective case studies from diverse geopolitical contexts provides valuable insights into successful models of justice financing and how they aid in the achievement of Sustainable Development Goals. These case studies illustrate the varied approaches that different countries have adopted to finance their justice systems and the impact of these strategies on sustainable development.

Germany's justice system is renowned for its efficiency and effectiveness, largely attributed to its holistic approach to financing. The German model is characterized by significant government investment in the legal infrastructure, which encompasses not only the courts but also legal aid services and judicial training. This comprehensive funding ensures high standards of judicial competence and accessibility, contributing to the achievement of SDG 16, which emphasizes peace, justice, and strong institutions. Additionally, the focus on legal aid and support services aligns with SDG 10, which aims to reduce inequalities by

providing equitable access to justice for all, including marginalized and low-income groups (Seibert-Fohr, 2012; Terry, 2015).

Rwanda presents a unique case of justice financing in a post-conflict setting. Following the 1994 genocide, Rwanda embarked on an ambitious judicial reform process, heavily investing in its legal system to restore trust and promote reconciliation. A significant part of this investment was directed towards community-based justice mechanisms, such as the Gacaca courts, which played a crucial role in dealing with the backlog of genocide cases. This approach not only facilitated more expedient justice delivery but also promoted community participation and healing, contributing to the realization of SDG 16. The Rwandan experience demonstrates how targeted justice financing in post-conflict contexts can aid in social recovery and strengthening of institutions (Ingelaere, 2016).

Singapore's justice system stands out for its strategic investment in technological innovation. The government has allocated substantial resources towards digitizing legal processes, implementing e-litigation platforms, and developing artificial intelligence tools for legal research. This technological advancement has increased the efficiency and transparency of the justice system, thereby enhancing public trust in legal institutions. Singapore's model exemplifies how investing in technology within the justice sector can contribute to SDG 9 (industry, innovation, and infrastructure) and SDG 16, by making justice processes more accessible and efficient (Peck, 2008).

The comparative analysis of justice financing approaches between Moldova and other countries offers critical insights into how different strategies impact the attainment of Sustainable Development Goals. By examining the variations in how justice systems are funded and managed, we can discern the efficacy of these approaches in promoting sustainable development.

Moldova's Justice Financing in Comparative Perspective

Moldova, a post-Soviet country, has faced numerous challenges in reforming its justice system. The legacy of Soviet-era legal frameworks and institutions, coupled with ongoing issues of corruption and political influence, has significantly impacted its justice system's efficiency and public trust (Goncearenco, 2023b; Tóth, 2022). Moldova's approach to justice financing has been characterized by limited resources, reliance on international aid, and ongoing efforts to align with European standards (European Commission, 2020b).

Comparison with Developed Countries: The Case of Germany

When compared to a developed country like Germany, the contrast in justice financing approaches is stark. Germany's justice system benefits from substantial, consistent government funding, which ensures independence, efficiency, and accessibility. This robust financing model has significantly contributed to Germany's achievement of SDG 16, which emphasizes the need for peace, justice, and strong institutions (Seibert-Fohr, 2012; Terry, 2015). In

contrast, Moldova's justice system struggles with underfunding and external influences, hindering its progress towards this SDG.

Comparison with Transitional Economies: The Case of South Korea

A comparison with South Korea, a country that has undergone rapid economic and legal transformation, is also instructive. South Korea has invested heavily in modernizing its justice system, including the adoption of technological innovations. This investment has not only improved the efficiency and transparency of the legal system but has also supported broader economic development, aligning with SDG 8 (economic growth) and SDG 9 (industry, innovation, and infrastructure) (Gronic, 2023). Moldova, while making strides in modernizing its justice system, still lags in technological integration and faces challenges in financing such advancements.

Comparison with Post-Conflict Countries: The Case of Rwanda

Examining Rwanda, a post-conflict nation, provides a different perspective. Post-genocide, Rwanda focused on rebuilding its justice system as a means of fostering reconciliation and social stability. Despite limited resources, the country prioritized community-based justice mechanisms and legal reforms, contributing significantly to social cohesion and the rule of law (Ingelaere, 2016). Moldova, although not a post-conflict country, can draw lessons from Rwanda's prioritization of justice in national rebuilding and its impact on SDG 16.

The comparative analysis between Moldova and countries like Germany, South Korea, and Rwanda reveals significant variations in justice financing approaches and their outcomes on SDG attainment. Developed countries with robust financing models exemplify the potential of well-funded justice systems in promoting strong institutions and economic growth. In contrast, Moldova's challenges highlight the need for sustained investment, modernization, and strategic reforms to enhance its justice system's efficiency and contribution to sustainable development goals.

Discussion and Synthesis

The critical analysis of the literature concerning justice financing and its impact on Sustainable Development Goals, particularly in the context of Moldova, reveals insightful trends and significant gaps. This analysis aims to dissect these findings, emphasizing the areas where current research is lacking and the implications for Moldova's judicial system.

The literature provides a robust understanding of how justice systems, when adequately financed, contribute to societal development and the achievement of SDGs. Studies from various countries, including developed and transitional economies, present a comprehensive picture of the benefits and challenges associated with different financing models. Key themes include the importance of judicial independence, the impact of technological advancements, and the role of legal systems in post-conflict societal rebuilding.

Countries like Germany and South Korea are often highlighted for their effective justice systems, attributed to substantial government investment and technological integration. Such studies offer valuable lessons in terms of creating efficient, transparent, and accessible justice systems, which are fundamental to achieving SDGs like peace, justice, and strong institutions (SDG 16), and economic growth (SDG 8).

Despite the breadth of global literature, there is a notable gap in research specifically focused on Moldova, particularly in detailing its post-Soviet transition and current justice financing challenges. Most studies offer a generalized overview of post-Soviet countries without delving into the intricacies unique to Moldova, such as its political history, socio-economic dynamics, and the specific challenges these present to justice reform and financing.

Another significant gap is the under examination of the role and effectiveness of international aid in Moldova's judicial reforms. While international assistance has been a key component of Moldova's justice system development, detailed studies assessing its long-term impact, sustainability, and influence on aligning with SDGs are lacking.

There is also a scarcity of comparative studies that position Moldova's experiences alongside those of similar transitional economies. Such comparative analyses could provide critical insights into the effectiveness of different justice financing models and their applicability to Moldova's context.

The gaps in the literature indicate a need for more Moldova-specific research, especially studies that take into account its unique post-Soviet challenges. This includes a deeper understanding of how justice financing can be tailored to address issues of corruption, political influence, and resource limitations, which are prevalent in Moldova.

The research underscores the importance of sustainable and independent financing for Moldova's justice system. Drawing from global best practices, Moldova needs to explore financing models that not only address immediate funding needs but also ensure long-term sustainability and independence from political fluctuations.

Linking theoretical insights from literature on justice financing to practical application in Moldova involves understanding how concepts and models can be adapted to the country's unique context. Moldova, with its specific historical, socio-political, and economic background, presents distinct challenges and opportunities in the realm of justice reform and financing.

The literature emphasizes the importance of judicial independence and transparency as cornerstones of an effective justice system. For Moldova, this translates into the need for reforms that minimize political interference in judicial matters. Adopting practices from countries with strong legal traditions, such as Germany, where the judiciary is well-resourced and operates independently of political influence, can offer a roadmap for Moldova. This includes restructuring the system of judicial appointments and promotions to ensure merit-based and unbiased processes (Seibert-Fohr, 2012; Terry, 2015).

Technological advancements in the justice sector, as seen in countries like South Korea, provide valuable lessons for Moldova. Implementing digital platforms for case management, e-filing, and online dispute resolution can enhance efficiency, reduce backlog, and improve access to justice. This not only aligns with global trends but also addresses specific challenges in Moldova, such as limited resources and the need for greater transparency (Gronic, 2023).

The literature underscores the significance of access to justice in achieving SDGs, particularly in reducing inequalities (SDG 10). Moldova can work towards this by improving legal aid systems and making legal services more accessible to marginalized and low-income groups. This includes not only financial investment but also policy initiatives aimed at expanding legal aid services and raising public legal awareness.

One of the primary challenges in applying these theoretical insights to Moldova is the country's resource constraints. Unlike developed countries with robust economies, Moldova's justice system suffers from limited domestic funding and heavy reliance on external aid. Balancing the need for sustainable, independent financing with the reality of economic limitations is a critical challenge.

Another significant challenge is the legacy of the Soviet legal system and the associated institutional inertia. Transforming deeply entrenched systems and mindsets requires not only financial investment but also a cultural shift in how justice is perceived and administered. This is a gradual process that involves educating legal professionals and the public about the principles of a democratic legal system.

Policy Implications and Recommendations

The comprehensive review of literature on justice financing and its impact on Sustainable Development Goals provides a foundation for proposing informed recommendations for policy changes and strategic approaches in Moldova. These recommendations are aimed at aligning justice financing with the effective achievement of SDGs, addressing the unique challenges and opportunities within the Moldovan context.

A key recommendation for Moldova is the enhancement of judicial independence and transparency. Drawing from the models of developed countries like Germany, Moldova should implement reforms that ensure judicial appointments and promotions are based on merit and are insulated from political influence. This involves revising current procedures and possibly establishing independent judicial selection commissions. Ensuring judicial independence is crucial for building public trust and fostering a legal environment conducive to upholding the rule of law, aligning with SDG 16 (peace, justice, and strong institutions).

Moldova's justice system requires increased and consistent government funding. This is essential to ensure its independent functioning and to reduce reliance on external aid, which can sometimes be unpredictable. Adequate budgetary allocations would allow for improvements in

judicial infrastructure, the employment of more qualified personnel, and the provision of better training for judges and court staff. Improved funding would directly impact the efficiency and effectiveness of the justice system, contributing to several SDGs, including SDG 16.

Another significant recommendation is the integration of technology in judicial processes. Learning from South Korea's experience, Moldova can invest in digital platforms for case management, e-filing, and online dispute resolution. This would enhance the efficiency and transparency of the judicial process, making it more accessible to the public. Technological advancements in the justice sector would also align with SDG 9 (industry, innovation, and infrastructure) and aid in achieving SDG 16.

Expanding access to justice, especially for marginalized and low-income groups, is critical. This involves increasing funding for legal aid and broadening its scope. Moldova should also consider implementing programs to enhance legal literacy among the population, ensuring citizens are aware of their rights and the means to access legal recourse. These initiatives would directly contribute to reducing inequalities (SDG 10) and enhancing gender equality (SDG 5) by providing equitable access to justice.

Implementing robust anti-corruption measures within the judiciary is essential. This includes establishing transparent systems for monitoring and evaluating judicial conduct and creating mechanisms for accountability. Strong anti-corruption measures would build public confidence in the justice system and contribute to the broader fight against corruption, aligning with SDG 16.

The review of existing literature on justice financing and its intersection with Sustainable Development Goals underscores the need for further research, particularly in the context of Moldova. Several areas emerge as critical for future exploration to better understand the nuances of justice financing in Moldova and to inform effective policy-making.

Firstly, there is a need for comprehensive studies assessing the long-term impacts of judicial reforms in Moldova. This research should evaluate the effectiveness of various reforms undertaken since the country's transition from Soviet rule. It should focus on aspects such as the independence of the judiciary, efficiency of legal proceedings, and public trust in the legal system. These studies are vital for understanding how reforms have affected justice delivery and their alignment with SDG targets, especially SDG 16, which emphasizes peace, justice, and strong institutions.

Given Moldova's reliance on international aid for justice system reforms, an in-depth analysis of this aid's role and effectiveness is essential. Future research should investigate how international funding, technical assistance, and capacity-building initiatives have influenced the development and modernization of Moldova's legal infrastructure. This analysis should consider both the positive outcomes and the challenges or dependencies that may have arisen from this reliance on external support.

Comparative studies with other post-Soviet or transitional economies undergoing judicial reforms can provide contextual insights beneficial to Moldova. Such research would help identify best practices, common pitfalls, and innovative strategies that could be adapted to the Moldovan context. These studies should particularly focus on how different nations have navigated the challenges of transitioning from a Soviet-style judicial system to one that aligns with European standards and SDGs.

With the increasing relevance of technology in judicial processes, research evaluating digital justice initiatives in Moldova would be particularly valuable. This research should assess the implementation and impact of technological advancements in the justice sector, such as e-filing systems, online dispute resolution, and digital case management. Understanding the effectiveness, challenges, and public reception of these initiatives is crucial for guiding future investments in legal technology.

Finally, there is a significant gap in research on the broader socio-economic impact of justice reforms in Moldova. Future studies should explore how changes in the justice system have affected various aspects of society and contributed to the achievement of SDGs, particularly those related to economic growth (SDG 8), education (SDG 4), gender equality (SDG 5), and reduced inequalities (SDG 10). These studies would provide a more holistic understanding of the role of justice in Moldova's overall development trajectory.

Conclusions

This study's examination of justice financing and its impact on Sustainable Development Goals in Moldova reveals critical insights into the strategic alignment necessary for enhancing the nation's legal and judicial frameworks. This review provides a deep understanding of the challenges and opportunities that justice financing presents, particularly within the context of Moldova's unique socio-political landscape.

A significant theme identified is the pivotal role of judicial independence in creating a just and equitable society. Evidence from countries like Germany, where substantial and autonomous judicial funding is a norm, shows that such systems engender greater public trust and legal integrity. For Moldova, this highlights the urgent need for reforms focused on protecting the judiciary from political interference and boosting the efficiency of legal processes. Implementing such reforms is essential for achieving SDG 16, which advocates for peaceful, inclusive societies and accessible justice.

Moreover, the analysis underscores the importance of technological innovation in modernizing justice systems. Experiences from nations such as South Korea, which has incorporated advanced digital technologies in its legal procedures, demonstrate the benefits of technology in enhancing judicial efficiency and accessibility. Moldova could significantly

benefit from similar technological enhancements, which could help mitigate resource limitations and improve public access to legal services.

Another critical observation is the necessity of ensuring broad access to justice, especially for marginalized and economically disadvantaged groups. This is crucial for attaining SDGs focused on reducing inequalities (SDG 10) and promoting gender equality (SDG 5). Effective strategies could include well-funded legal aid systems and public legal education initiatives, which have proven successful in other contexts and could be adapted to Moldova's needs.

The study also points to the significant role of international aid in supporting judicial reforms in Moldova. While external support has been instrumental, there is a pressing need for Moldova to develop robust, internally driven financing strategies for its justice system to lessen its dependency on international aid.

For Moldova, the path forward involves strategic investments in the justice system tailored to meet specific SDGs. The country's history as a post-Soviet state presents unique reform challenges that require targeted strategies to ensure judicial independence, leverage technological advancements, enhance justice access, and establish sustainable financial models.

A comprehensive and multi-faceted approach is necessary for aligning justice financing with SDG attainment in Moldova. This approach should combine efforts to reinforce judicial independence, harness technology for better justice delivery, expand access to legal services, and develop enduring financing strategies. These reforms are not only vital for upholding the rule of law and ensuring fair access to justice but are also crucial for driving economic growth, promoting social equity, and enhancing political stability, thereby contributing to sustainable development and a more just, inclusive society in Moldova.

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SUPERVISION OF FINANCIAL AUDIT ACTIVITY IN THE REPUBLIC OF MOLDOVA - REFORMS AND OPPORTUNITIES FOR MODERNIZATION

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Abstract: *At present, financial auditing in the Republic of Moldova is supported by a legislative framework in line with international best practices and the EU acquis. However, the changing nature of services in the domestic audit market and the current challenges of meeting new quality management requirements are of interest for scientific research in this field. This paper aims to investigate the opportunities for modernization of the profession in the context of the attested reforms regarding the supervision of audit activity in the Republic of Moldova. The aim of the investigation is to highlight the importance of legislative reforms in order to increase the prestige and recognition of the professionalism of financial audit activities in the Republic of Moldova. In addition, this paper includes a study of professional qualifications in auditing and an analysis of the activities carried out by audit entities in recent years of monitoring the audit market by the supervisory authority. The issue of reforming the regulatory framework for the audit of financial statements in line with international good professional practice is considered.*

The investigation used the qualitative research method and the observation technique based on the analysis of national and international normative acts. The results indicate a good harmonization of the regulatory framework of the financial audit activity in the Republic of Moldova with the international practices in this field, which will contribute to the development of the domestic process of regulating the profession and at the same time will provide opportunities for modernization of the system of supervision of the quality of audit activity in the country.

Keywords: *audit activity, audit profession, international auditing practices, professional standards, qualification certificate, quality management audit, supervisory authority, statutory audit.*

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Introduction

Currently, the legislation of the Republic of Moldova includes all elements of a comprehensive system of audit oversight, which has been aligned with the provisions of the European Directive 2006/43/EC on statutory audit of annual accounts and consolidated annual accounts and has been harmonized with the requirements of the European Union Regulation

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(EU) No 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements for statutory audit of public-interest entities.

The timeliness of this investigation is due to the lack of investigations to demonstrate compliance of the domestic audit oversight framework with international auditing standards. In recent years, the supervisory authority has issued several decisions on the authorisation and monitoring of the audit services market without public scrutiny and comment from the point of view of compliance with the regulations in force. The Republic of Moldova is one of the countries that continues to stand out through reforms related to the alignment of the regulatory framework in the field of audit of financial statements with international best professional practices, recognized by most audit oversight authorities. In this context, the Audit Oversight Authority is constantly concerned with improving the process of supervision and control of audit activity in the Republic of Moldova in accordance with international and European professional auditing standards.

In recent years, the supervisory authority has issued several decisions on the authorization and monitoring of the audit services market without public scrutiny and comment from the point of view of compliance with the regulations in force. Legislative reforms in the Republic of Moldova have created favorable conditions for strengthening the supervisory and regulatory system for financial auditing. The current audit quality assurance system in the Republic of Moldova is managed by the Public Audit Oversight Board (PASB). It is the only central public audit oversight authority at country level with the status of a legal entity and operating as an autonomous public institution.

The measures initiated by the Republic of Moldova on the implementation of reforms in the development of audit activity are supported by the EU on the basis of the Association Agreement signed on 27 June 2014 and ratified by the Parliament of the Republic of Moldova a few days later, on 2 July. It is therefore important to carry out research to examine the issue of reforming the current regulatory framework for the audit of financial statements in line with international best professional practice.

The gradual harmonization of the domestic legislative framework with EU rules has contributed to the restructuring and modernization of the regulatory process of the audit profession. Other progress can also be mentioned in relation to the compliance of the audit activity in the Republic of Moldova with international good professional practices, recognized by most audit oversight authorities:

- development of standards on the exercise of quality control, audit certification and professional training;
- approval of several decisions on audit quality assurance by the PASB.

The research aims to study the current situation of the audit profession and to comment on the importance of harmonizing the regulatory framework with international practices. By carrying out an investigation of the legislative reforms in the Republic of Moldova, as well as

of the international best practices in the practice of auditing, the aim is to highlight the role of the harmonization of the regulatory framework in ensuring favorable conditions for strengthening the system of supervision and regulation of the financial audit activity.

Analysis of the reforms of the financial audit legislative framework

The Republic of Moldova is one of the countries that continues to stand out through reforms related to the alignment of the regulatory framework in the field of audit of financial statements with international best professional practices, recognized by most audit oversight authorities. The reforms in the field of auditing that have taken place in the Republic of Moldova have been marked by a number of regulatory developments in line with international regulations.

The Government of the Republic of Moldova, on the basis of Resolution No. 180/23-03-2012, accepted the application of the Auditing Standards and Code of Ethics developed by the International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants. The Audit Quality Framework: key elements forming an audit quality environment, accepted and published by the Ministry of Finance under Order No. 113 of 05.08.2016, was approved.

In the Republic of Moldova in recent years important reforms, in line with international good practices and the EU acquis, continue to be implemented in the field of audit, such as:

- entry into force of the Law no. 271/ 15-12-2017 on the audit of financial statements, which expresses the concept of transposition into Moldovan law of the provisions of European Directive 2006/43/EC on statutory audit of annual accounts and consolidated annual accounts;
- approval by the Government of the Republic of Moldova of the Regulation of activity of the PASB, according to the Government Decision no.807/20-08-2018.

The reform of the legislative framework in the field of financial auditing has allowed the improvement of the regulatory and supervisory rules for the audit profession. Emphasis was placed on increasing the prestige and recognition of audit professionalism at regional level by developing the concept of transposing the provisions of Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audit of annual accounts and consolidated accounts into national law. During 2019, the regulation of audit trainees, professional certification and quality control in auditing were developed and discussed with the domestic public, and as a result of this process the PASB made decisions on the acceptance of the following normative acts:

- Rules for the professional training of audit trainees, approved on the basis of PASB decision no.15/06-08-2019;
- Regulation on certification of auditors, PASB decision no.16/14-08-2019;
- Regulation on external audit quality control, PASB decision no.17/14-08-2019.

The PASB monitors the audit traineeship, which lasts at least two years and takes place under the guidance of an auditor. Any natural person who is employed by an audit firm and holds a university degree in economics or law can be an audit trainee. Persons who have at least 15 years' service in the economic or legal field are exempt from the audit traineeship.

The examination of the professional training and practical experience of individuals wishing to practice auditing is carried out by the Certification Commission of Auditors of the PASB. The members of the Certification Commission are specialists from the Ministry of Finance, professors of higher education institutions in the subjects examined. The members of the Certification Commission may not include persons who perform the audit of financial statements or are involved in the process of preparing persons for the examinations for obtaining the professional qualification of auditor.

ISQM 1 and ISQM 2 are new standards that apply in the territory of the Republic of Moldova by virtue of Order no.113/21-11-2022 issued by the Ministry of Finance. The current standards provide for mandatory quality controls of audit results of listed companies or for those cases where this is required by law. In addition, the audit entity may decide on its own to carry out an engagement quality assessment in response to identified quality risks. For example, in situations where auditors have been found to have operated with more difficult judgements.

In line with the new requirements of the audit quality management standards, a fundamental change can be observed by replacing the concept of quality control with quality management. Thus, the concept of quality control has been replaced by that of quality management, which is largely based on the risk-based approach. This emphasis on the part of the IAASB is due to the fact that in many corporate scandals of late, the root cause is the absence of accountability at the level of the audit entity's organizational management and its advisors.

The risk management-based approach to audit is proposed for use in quality management at the engagement level, which will result in management and control forming the basis of the audit quality management system. If the management of the audit entity does not endeavor to do this and does not take responsibility for it, it cannot be said that the audit quality management system is stable.

After the revision, ISA 220 (Revised) "Quality Management for an Audit of Financial Statements" is accepted together with the stated standards to be applied by the subjects of audit activity in the country by virtue of Order No.20/23-02-2023 issued by the Ministry of Finance. The revisions to this standard more clearly assign responsibility for audit quality management and assurance to the audit partners. This implies, in particular, its active participation in the audit throughout the duration of the mission's work.

In the current version of the revised standard, the importance of forming an appropriate culture not only at the level of the audit entity, but also within the separate audit team engagement is emphasized, including maintaining an appropriate level of professional skepticism. In the current environment, as set out in ISA 220 (revised) the engagement partner

must also oversee the conduct of the engagement and determine the direction of the engagement, which includes consideration of the nature of the engagement, its circumstances and available resources.

According to Iachimovschi, A. & Grumeza, D. (2019, September 27-28) in the Republic of Moldova there is a certain conceptual basis of audit monitoring which at the time was incipient. Subsequently this topic was addressed by one of the authors at the international scientific conference in April, 2023.

Data and Methodology

The objective of this paper is to examine the legislative framework in the field of financial audit in order to highlight both the points of convergence with international practice and specific elements of the quality assurance system of financial audit work in the Republic of Moldova. The research methods used are qualitative research and observation technique, carried out by studying national and international professional normative acts, European directives applicable in the field of auditing, fundamental principles and practices of continuous training of certified auditors, as well as the organization of audit activity supervision.

In order to substantiate the study, the analysis and synthesis of information is applied with the application of the deductive and inductive method in order to provide a clear argument. This research aims to examine the current state of regulation of the audit services market through the lens of modern trends in the refinement of the *acquis Communautaire* of the beneficiaries of financial reporting and related audit opinions.

The scientific and methodological basis of the work in question is the manuals published by the regulatory authority in the country, the decisions of the supervisory authority in the field. The focus of the research is the current domestic regulatory framework for audit quality assurance with the recent entry into force. Therefore, the research took into account the recently published national works dealing with the decisions of the supervisory authority in this field, which have been nominated in the attached bibliography.

International auditing standards were researched on the requirements for the performance of audit work and difficult issues were identified on the monitoring of this work, how to approach good audit practices. The present research was based on the technique of observation, comparison of information from various official sources published by the competent authorities. The aim and objectives of the investigation are concerned with theoretical and methodological issues relating to the identification of the main concerns related to the modernization of the profession in question, as well as addressing the significant rationales related to licensing, certification and supervision.

The Model and Findings

The audit activity can be practiced in the Republic of Moldova by auditors on the basis of the auditor's qualification certificate under the conditions of the Law no.271/15-12-2017. Auditor certification is intended to test professional competences and examine practical experience. In the Republic of Moldova, the PASB is the authority that manages the process of organizing the examination for obtaining the professional qualification of auditor. And the direct conduct of the examination is the responsibility of the Commission for Certification of Auditors, which operates under the PASB.

The current legislation allows the practice of auditing not only citizens of the Republic of Moldova but also foreign nationals or stateless persons holding international qualification certificates in the field of accounting and auditing, such as ACCA (Association of Chartered Certified Accountants), DipIFR (Diploma in International Financial Reporting), CIPA (The Certified International Professional Accountant), CAP (Certified International Professional). Depending on the type of certificate held, the persons concerned are exempted from some examinations for obtaining the professional qualification of auditor in accordance with the provisions of the Regulation on certification of auditors, which was approved on the basis of decision no.16/14-08-2019 issued by the PASB.

Statutory auditors approved by the competent authorities of an EU Member State under the terms of Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 are also exempt from examination, except for the law discipline.

At present, there are also other professional accounting qualifications with an international reputation, such as those issued by CIMA (Chartered Institute of Management Accountants) or ICAEW (Institute of Chartered Accountants in England and Wales), which meet the eligibility criteria for the professional qualification of auditor. These institutions are known for their policies of maintaining high standards of professional practice and conduct in the field of accountancy.

Information about certified auditors is published in the Public Register of Auditors which is placed on the PASB website. According to the data in this Register in the period 2019 - 2022 up to 242 auditors were registered. The situation regarding the number of auditors registered in this register for the period under review is shown in Figure 1.

According to the data presented in the figure above, the majority of auditors carry out audit work. Only a small number of auditors have suspended their activity or are not carrying out audit work. At the same time, there is an insignificant upward trend in the number of auditors who do not practice this activity but continue to hold an audit qualification certificate.

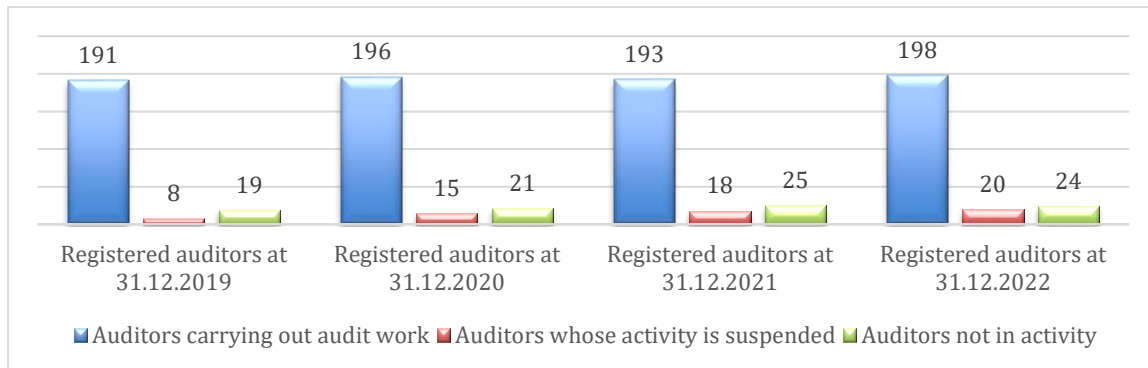


Figure 1. Number of auditors registered in the Public Register of the PASB

Source: author processing based on PASB reports. <https://cspa.md/node/58>

Although the practice of auditing obviously contributes to raising professional competence, in the context of the legal framework the basic condition for the validity of the auditor's qualification certificate is compliance with the obligation to participate annually in a certain number of hours in continuing professional development courses.

In order to understand the degree of involvement of auditors in the practice of audit activity, the following presents the domestic audit market situation of the main categories of activities performed by audit entities in the Republic of Moldova during the period under review.

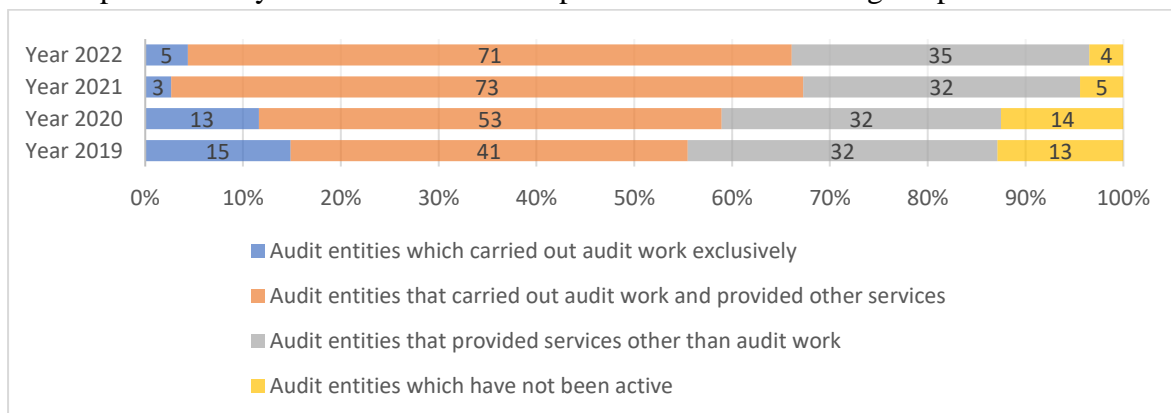


Figure 2. Activities carried out by audit entities in the Republic of Moldova during 2019-2022

Source: author processing based on PASB reports. <https://cspa.md/node/58>

Analyzing the dynamic situation of the activities carried out by audit entities in the period 2019-2022, there is a clear trend of a significant increase in the number of audit market players offering audit services. If in 2019 there were 41 audit entities operating on the market that performed audit activity and provided other services then in the following years the number of these entities increased considerably and as a result in 2022 this number was 71 entities. At the same time, there is a decreasing trend in the number of entities that carried out exclusively audit activity from 15 entities in 2019 to 5 audit entities in 2022.

Therefore, it can be concluded that during the period under review there is an increased interest in auditing and other related services in connection with the entry into force of Law No. 287/15-12-2017, which requires auditing not only to public interest entities but also to large and medium-sized entities.

Developing the audit market involves monitoring and supervising conflicts of interest and quality in accordance with professional standards in the field. In the context of developments in the audit market, conflicts of interest are important to ensure auditor independence. Fees for an audit are independent as long as there are no conditions attached to the provision of other services to the same client. Tax, accounting and other services in relation to the development and implementation of internal controls and the performance of internal audit or auditor functions may not be provided concurrently in relation to the same audit client for the same audit period.

PASB is responsible for performing external audit quality control to detect non-conformities in the performance of audit engagements and the application of quality control policies and procedures at the audit firm and audit engagement level.

According to Article 41(3) of Law No. 271/15-12-2017 every audit entity performing audit of public interest entities is subject to external quality control at least once every 3 years. Since the date of entry into force of the Regulation on external audit quality control (PASB Decision no.17/14-08-2019) 40 audit entities have been subject to external audit quality control.

Table 1. Split by year of audit entities subject to external audit quality control

Years	Number of audit entities audited	Period under external control
2019	4	years 2016-2018
2020	11	years 2017-2019
2021	11	years 2018-2020
2022	14	years 2019-2021

Source: author processing based on PASB reports. <https://cspa.md/node/58>

Based on the reports published by the PASB, it can be seen that out of the 40 audit entities, subject to external quality control in the period 2019-2021, only 19 audit entities spent audit missions to public interest entities. They are included in the list of entities subject to external control, and a significant part of them are foreign owned.

Decisions of the PASB on the sanctioning of audit entities and auditors are published on the institution's official website. In accordance with the legal framework the authority concerned is entitled to apply disciplinary measures to audit entities and auditors respectively

for carrying out inadequate audits. The most severe disciplinary measures that can be decided by the PASB relate to the removal of audit entities from the Public Register, the withdrawal of the qualification certificate, the suspension of the auditor or the audit entity, the declaration and consideration of the auditor's report as improper.

The current efforts of domestic audit entities to meet the requirements of professional standards in the field, significantly revised in recent years in terms of quality management assurance, are a challenge for the domestic business environment to comply with the regulations issued by the IAASB, which have been placed by the Ministry of Finance of the Republic of Moldova on the website. These adjustments are contained in the manual containing the full set of regulations issued by the IAASB on quality control, audit, review, other assurance and related services, as well as International Practice Notes on Auditing.

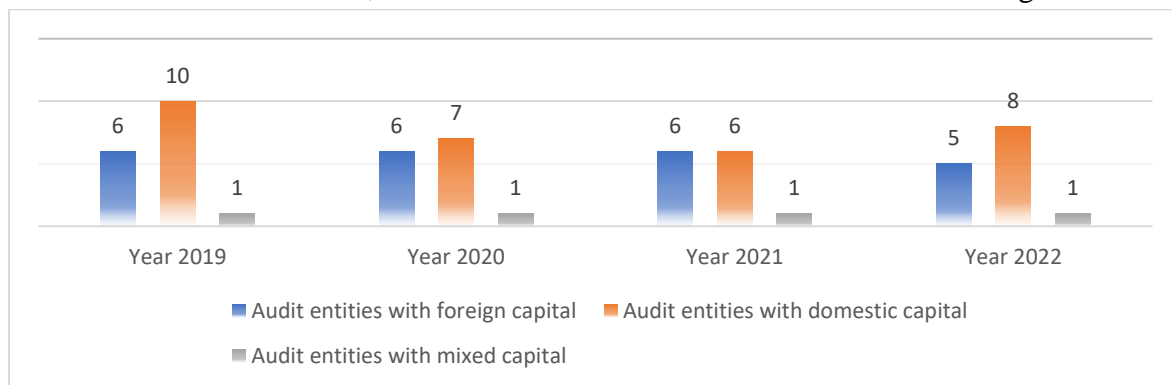


Figure 3. Presence of foreign, domestic and mixed capital audit entities in the market for auditing the financial statements of public interest entities

Source: author processing based on PASB reports. <https://cspa.md/node/58>

According to the data in Figure 1, during the period under review, there was first a reduction and then an increase in the number of entities with domestic capital involved in auditing public interest entities. Out of 10 auditing entities that audited public interest entities in 2019, 4 of them withdrew from this market segment in 2021 and in the following year 2022 there will be 8 entities. At the same time, during the period under review foreign and mixed capital audit entities are equally present in the engagements for auditing the financial statements of public interest entities.

According to the provisions of Article 3 of the Law no.287/15-12-2017, the following are considered to be public interest entities: an entity whose securities are admitted to trading on a regulated market; a bank; an insurance company; an undertaking for collective investment in securities with legal personality; a large entity that is a state-owned enterprise or a joint-stock company in which the state share exceeds 50% of the share capital.

There may also be a discussion about the responsibilities of senior management within the audit entity. It is important to know the extent to which the audit entity's management is involved in the management of audit quality.

Systematic monitoring of structural changes within the audit entity should also be discussed, as this would be a solution to quality management assurance issues. In this context, organizational issues should not be excluded, how information should flow within an audit entity and what is the cost of the investments needed to modernize the quality management system and comply with new requirements.

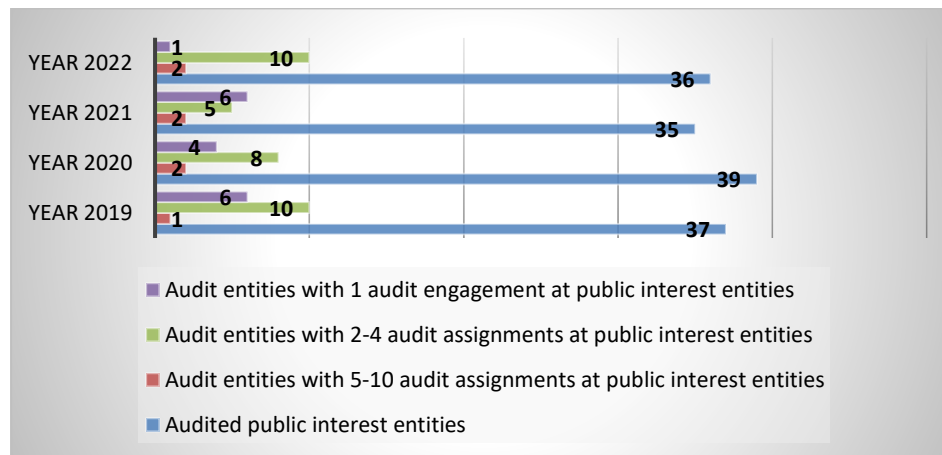


Figure 4. Capabilities of audit entities to audit public interest entities

Source: author processing based on PASB reports. <https://cspa.md/node/58>

In 2019, 37 public interest entities were audited, in 2020 - 39 entities, in 2021 - 35 entities, and in 2022 - 36 entities. According to the data reported by the PASB on the audit market there are audit entities that have demonstrated the ability to perform concurrent audits of 10 entities of public interest, this level was recorded in the period under review by 2 audit entities. At the same time, while in 2019 only one audit entity undertook to perform more than 5 audit assignments at public interest entities, in subsequent years this performance was recorded by 2 audit entities. During the period under review, most of the audit entities have contracted from 1 to 4 audit engagements to public interest entities.

The current efforts of domestic audit entities to meet the requirements of professional standards in the field, which have been significantly revised in recent years in terms of ensuring quality conditions, are a challenge for the domestic business environment to comply with the regulations issued by the IAASB, which have been placed by the Ministry of Finance of the Republic of Moldova on the website. These adjustments are contained in the manual containing the full set of regulations issued by the IAASB on quality control, audit, review, other assurance and related services, as well as International Practice Notes on Auditing. The current

requirements on audit quality management provide opportunities for compliance with best practices in this area, such as those presented in Table 2.

Table 2. Opportunities for modernization of audit activity in the Republic of Moldova in the context of alignment with international best practices

Directions for improving audit practice	Regulatory and methodological support	Subjects supervised and monitored
Adjustment of quality management policies and procedures	ISQM 1, ISQM 2, ISA 220 (Revised) requirements	Quality management system design and implementation actions
Revision of the methodology for exercising external audit quality control	PASB Regulation on external audit quality control	Adjustment of the quality test criteria applied to the exercise of external control
Designing and promoting key elements of an audit quality environment	IAASB framework for audit quality	Allocation of the necessary resources to ensure the conditions for carrying out audit missions

Source: prepared by the author based on the study of the audit regulatory framework. <https://mf.gov.md/ro/lex>

Currently, small audit entities in the Republic of Moldova face a shortage of qualified staff. Often, long-standing relationships between the client and the audit entity, but also due to a smaller labor market in this field, can lead to circumstances that would compromise audit quality and auditor independence. It is therefore important for these entities to ensure that they have sufficient resources when they intend to audit the financial statements of public interest entities and other large companies.

The audit entity must have as employees not less than two auditors for conducting the audit of public interest entities and large entities, established under the Law on Accounting and Financial Reporting No. 287/15-12-2017.

Internal control over audit quality is ensured by the audit entity developing its own internal control policies and procedures. Law no.271/15-12-2017 as well as the auditing standards contain specific provisions on audit quality assurance. Domestic audit entities develop and apply internal quality control procedures in accordance with the provisions of international standards for quality management. The legal framework prescribes a set of requirements, which must be complied with in order to design and implement an internal audit quality control system.

According to Article 24 (5) of the Law no.271/15-12-2017 the quality control of the audit engagement is exercised in public interest entities and large entities. This control shall be carried out until the auditor's report or supplementary report to the audit committee is issued. The engagement quality control is intended to provide an objective assessment, at or before the

date of the report, of the significant judgements made by the engagement team and the conclusions reached by the engagement team. At the same time, engagement quality control should provide the auditor with reasonable assurance regarding compliance with professional standards and applicable legal and regulatory requirements.

Conclusions

The gradual harmonization of the domestic legal framework with international audit quality standards has contributed to the restructuring and modernization of the regulatory process of the audit profession in the Republic of Moldova.

As the CSPA plays an important role in increasing the prestige and recognition of the professionalism of financial audit activities in the Republic of Moldova, we consider it appropriate to consider the following opportunities offered by the current framework in this field:

- cooperation with other supervisory authorities of the audit profession;
- organization of discussions with the audit profession on the findings of inspections carried out to improve the quality of auditing;
- reviewing the approach to external controls and developing the audit inspection methodology.

The development of relations with the audit oversight authorities in other countries and collaboration with the Committee of European Audit Oversight Bodies provides opportunities to exchange experience and identify training needs for inspectors. Interactions with regulators in other countries, including joint inspections, would foster the sharing of experience and the development of quality control methodology.

An ongoing dialogue of PASB with the audit profession will ensure more effective cooperation to develop inspection approaches. We are of the opinion that discussions should be held with the business community on the findings of inspections through the prism of professional standards, and that proposals by audit firms to improve the quality of audit assignments should be considered, which will strengthen trust between them and the supervisory authority.

Organizing meetings with the audit profession once every two or three years would contribute to the development of dialogue with the business community and would be a challenge to co-engage the largest international and European networks of audit firms in discussions on:

- analysis of the database of inspection findings and observations;
- the narrative of the complex approach to quality inspection methodology;
- ensuring and making effective use of communication platforms between the supervisory authority and the audit profession;

- the use of digital technologies in the monitoring and reporting of systemic risks related to the quality of audit engagements.

The development of the domestic legal framework has improved aspects of regulating the effectiveness of audit quality management within the audit entity, which usually takes place through annual assessments, but can also be carried out more frequently. In order to avoid subjectivity, it is advisable to assess audit quality control policies and procedures from the point of view of their effectiveness, the best evidence of which is the record of assessments and proposed measures for their modernization.

It should be noted that the research is limited by ensuring the confidentiality of the analytical data of the inspection findings carried out to improve audit quality. The results of this research are addressed to the regulatory and supervisory authorities of the audit activity in the country, as well as to the participants of the audit services market.

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THREAT PERCEPTION AND MEMORY IN THE BALTICS AND UKRAINE

Joseph ELLIS*¹

Abstract: *The invasion of Ukraine highlights the continued threat Russia poses to Eastern Europe. This essay describes these threats as twofold: investigating both the material realities of soldiers and weapons, as well as abstract notions like the role played by ideas and history. Discussing examples such as the “war of monuments,” the Baltic forest brothers, and the Holodomor, this paper examines how contrasting approaches to history and memory can lead to conflict in the region, particularly when threats are perceived differently by competing actors.*

Keywords: *threat perception, historical memory, memory wars, Baltic states, Ukraine, Estonia, Latvia, Lithuania.*

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Introduction

Since the renewed invasion of Ukraine by Russia in February 2022, many political observers in Eastern Europe have tried to make sense of the threat Russia poses to their own territory. “Is Estonia or Latvia, next?” was an all too common headline in 2022 and 2023. While such fears for the Baltics are perhaps mitigated by the military support of the NATO alliance, how countries and their individual citizens perceive threats – what international relations scholars refer to as threat perception – is an ever-present concern for the countries neighboring Russia. As Harvard professor J. David Singer wrote, threat perception is the process by which, “each [state] perceives the other as a threat to its national security, and such perception is a function of both estimated capability and estimated intent” (Singer, 1958, p. 94).

While many scholars interpret “threats” to be purely physical or material in nature, such as the size of a military or the development of certain weapons caches, in the Baltic states and Ukraine, threat perception is also influenced by how past events are understood. This scholarship is often described as that of historical memory, or the politics of remembering. A great deal of recent scholarship among Baltic and Ukrainian scholars deals with this historical memory, or the manner in which we understand and commemorate (or even ignore) the past. Olga Malinova, using the concept of ontological security, argued that “securitizing national memory, that is, representing its misunderstanding and misrepresenting by other(s) as an existential danger for national identity,” is of central importance to countries such as the Baltics

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and Ukraine, who are trying to carve out a cohesive national identity, after years of feeling threatened by Soviet occupation (Malinova, 2021, p. 1003). The growth in the study of memory politics is itself a result of a more ecumenical and inclusive approach to political science. The influence of constructivism within international relations theory allows for “non-material” components such as identity and memory to play a role in constructing threat. As Douglas Becker wrote: “... [M]emories are contextualized through the collective experiences of the people who recall and give meaning to events” (Becker, 2014, p. 61).

Historical memory – like threat perception – involves an often mentally-taxing exercise of reducing complex political and historical moments into something more understandable for ourselves, and others. Creating memory is itself a complex process, in part propagated by political elites, and then understood and shared by the layperson. More importantly, not all memories are treated the same. In the case of Russia, the Baltic states, and Ukraine, these sides perceive and remember differently. The Baltic and Ukrainian experience as occupied nations under the Soviet Union, with its forced removals to Siberia, the treatment of its national identity and national symbols as illegal, and the political, economic, and educational upheaval which resulted, was deeply felt and experienced by Estonians, Latvians, Lithuanians, and Ukrainians.

Russia, on the other hand, has sought to write its own history as that of the saviors of the Baltic and Ukrainian people. The commemoration of days like May 9th, which for Russians marks the celebration of their victory over fascism, greatly animates Russian nationalism and pride in Russian identity. As Gatis Krūmiņš argued regarding the Baltic states: “The central point [of Russian strategic communication] ‘is the [propagation of the] idea of the ‘ungrateful Baltic people’” (Krūmiņš, 2018, p. 71). Because the Soviet Union defeated the Nazis, the story goes, Balts (and Ukrainians) should be eternally grateful. Russia has long engaged in narratives that craft such perceptions and memories. Vladimir Putin’s pervasive use of the terms “fascist,” and “Nazi” to describe Baltic critics, and his attempt to “de-Nazify” Ukraine through an act of war, are perfect examples of how contemporary politics collides with national memory and history, what numerous scholars have described as “memory wars.” This is especially true in countries such as Estonia, Latvia, and Ukraine, which have sizeable Russian-speaking populations, and who may get their information from Kremlin-sympathetic sources. The intersection of threat perception and memory -- specifically how feelings of the past contribute to decisions made in the present – will be the subject of this essay. Moreover, this essay also seeks to understand threats as an abstraction, rather than directly grounded to material substance. In other words, threats are not only understood as foreign enemies with large weapons, but also domestic and transnational actors harboring particular historical or political points of view. Such an understanding helps to make sense of how a country’s politicians and people behave.

The approach of the paper is comparative in scope. Not only are Estonia, Latvia, Lithuania, and Ukraine compared to one another, these four separate cases can also be seen collectively as a post-Soviet case to compare vis-à-vis Russia. Methodologically speaking, this research is qualitative in nature, investigating primary and secondary sources. Newspaper and journal articles, as well as monographs, are cited in the text for evidence. At its core, the paper takes ideas and memory seriously, especially how elites make choices – such as destroying a statue – which can then reframe how a society thinks about its history. Lastly, this project uses insights from the constructivist literature in international relations to rethink threat perception in the region.

Organizationally, the essay is laid out in two parts. The first section analyzes in detail how threat perception and feelings of security play out in the Baltics and Ukraine as it relates to material issues, especially concerns related to size (both military and land area) and demographic composition. Having a large and aggressive military beside you makes you vulnerable, and having Russian citizens sympathetic to that military living among you also creates cause for concern. This dynamic has influenced policy decisions in the region related to the military and language policy. The second section looks at threat as a concept that can be more abstract in scope: it implies that memory itself can be threatening.

This section investigates domestic and international threats through the auspices of the memory literature, highlighting Russian and Soviet history commemoration within the Baltics and Ukraine, and how such commemoration can act as a threat to those who reside there. One such example is what scholars have referred to as the “war of monuments,” or how the creation, placing, and in some cases, removal of certain monuments aggravates tensions within societies. The question of Russian memory will also be examined: how the current Russian government articulates its past within its own borders, and how Russians living abroad may understand their place in societies increasingly at odds with their culture, values, and ideas. Additionally, this section tackles the question of historical memory in the Baltics and Ukraine through the use of two case studies: that of the Baltic forest brothers, and the Holodomor. These two cases demonstrate how the historical record is used – and abused – by Russian authorities, while also acknowledging that work still needs to be done to unpack complex histories in the region.

Military, Demographic, and Linguistic Threats in the Baltics and Ukraine

What makes Russia objectively a threat to the Baltics is obvious. Russia geographically borders Estonia and Latvia to the west, and Lithuania borders the Kaliningrad Oblast, a Russian enclave to its south. Most straightforward, Russia is large: it is geographically large, has a large population, and a large military with nuclear weapons. All combined, the population of the Baltic states is around 7.5 million to Russia’s 145 million. The combined Baltic military is around 22,000 soldiers. The Russian military is approximately 830,000 troops. Russia has used military power in its past and more recently. Russian imperialism in terms of war and occupation cost millions of lives in the 20th century, and military conflicts in Georgia and Ukraine in the 21st century have killed thousands. Russia has been a bad neighbor, and a threat to those in the region. The Baltic states in particular are part of what international relations scholars refer to as having “small state” problems. The situation Estonia, Latvia, and Lithuania finds itself in is one of balancing the autonomy to act independently while also needing to enmesh the countries into larger organizations, such as NATO and the European Union. As Ole Waever states: “...[S]ecurity problems are developments that threaten the sovereignty or independence of a state in a particularly rapid or dramatic fashion, and deprive it of the capacity to manage by itself. This, in turn, undercuts the political order” (Waever, 1993, p. 6).

The threats to Ukrainian security are qualitatively different from that of the Baltic states. While Ukraine similarly borders Russia, unlike the Baltics, Ukraine is not a small state. Ukraine is the second largest country in Europe in terms of area, and around seven times the combined population of the Baltic states. The Ukrainian army is also considerably larger, around 300,000 troops all told, not counting reservists. Most notably, however, Ukraine does

not have the protection and backing of NATO.² While it should be noted that billions of dollars in aid – both military and humanitarian – have been provided to Ukraine from throughout Europe, the United States, and Canada, Ukraine is primarily bearing the considerable costs of the Russian invasion, in terms of resources, territory, and casualties. One other major difference from the Baltic states is that Ukraine’s transition to democratic elections and practices has been more uneven. Ukraine has consistently scored as a “partly free” or transitional democracy, compared to the Baltics status as “free” countries. Ukraine’s political transition has been marred by frequent corruption scandals, allegations of vote tampering, and a too cozy relationship at times with Vladimir Putin and Russia, something uncommon to the Baltic states, at least at the federal level. The Euromaidan protests, for example, in 2014 were the result of Ukrainian president Viktor Yanukovich reneging on an economic agreement with the European Union in favor of securing a large loan with Russia instead.

One certain commonality between the Baltic states and Ukraine is ethnic tension. This may indeed be the longest-lasting and most notable domestic threat that these countries deal with. In the early 1990s, Russia tried to make sense of what to do about Russian minorities scattered about the landscape of the former Soviet Union. Using the idea of the “near abroad,” Boris Yeltsin and his foreign minister Andrei Kozyrev constructed a civic definition of Russian citizenry which allowed for those identifying as Russian – no matter where they were – to appeal to Moscow for help (Freudenstein, 2015, p. 119). Such an idea is the reasoning for Russian attempts to “protect” its people via foreign intervention, an argument used both in Georgia and Ukraine. Moreover, such a policy has had unintended domestic consequences, as Russians in the former Soviet footprint have been less willing to integrate culturally and socially into their native countries.

Additionally, Estonia, Latvia, and Ukraine also all have large numbers of Russian speakers, some of whom feel little to no connection to their country of residence. In discussing Ukraine, Menon and Rumer noted that the “Soviet legacy... affected Ukrainians’ notion of who they were. Ukraine was now a national state. But the meaning of ‘national’ was ambiguous” (Menon & Rumer, 2015, p. 22). And as Aleksandra Kuczyńska-Zonik remarked about Russian-speakers in Estonia and Latvia: “[they] are large, relatively hermetic, concentrated populations that reside on Russia’s border... [T]hey are not Russians *per se*; they are said to be Euro-Russians with hybrid Baltic-Russian identity” (Kuczyńska-Zonik, 2017, p. 31). The percentage of those identifying as ethnic Russians in Estonia and Latvia is around 25-26 percent, primarily consisting of residents in border communities near Russia, as well as the larger cities of Tallinn and Riga. Those identifying as ethnic Russians in Lithuania is considerably smaller, around 6 percent (Kuczyńska-Zonik, 2017, p. 31).

Citizenship policy toward the Russian minority has been a point of contention for Russians living in these countries, and Russia generally. After the break-up of the Soviet Union, Estonia and Latvia provided automatic citizenship to any persons who could document ancestry prior to 1940, or the year the Soviet Union began their occupation. This ensured that Estonians and Latvians with familial ties from the independence period could seamlessly receive new

² Ukraine has explored deeper ties into Western institutions such as the European Union and NATO for over thirty years, with no success. The Russian invasion of 2022 spurred more formal attempts for Ukraine to join both institutions, with some optimism that the country will be admitted.

passports, but forced those families coming after 1940 – primarily Russian and other Soviet immigrants – to essentially reapply for citizenship with the caveat that they must be able to speak the native language. As Andres Kasekamp noted, this essentially broke the population into three groups: citizens, those who left the Baltics and returned to Russia or other countries, and so-called “stateless persons,” who remained in Estonia and Latvia and either would not, or could not (because of the language barrier), get citizenship (Kasekamp 2018, 168). Kasekamp also remarked that while the initial hope was that such “stateless persons” would leave the countries, “the Estonian and Latvian governments had begun to realize that time alone would not solve the problem and that a more proactive approach was needed” (Kasekamp 2018, 168). Efforts throughout the 2000s have been made to further integrate this population, with somewhat limited success. As Graham Smith pointed out, an inevitable consequence of not allowing ethnic minorities automatic citizenship is that they are marginalized in the political process. “Without citizenship,” Smith wrote, “permanent residents do not have the right to vote in national elections” (Smith, 1996, p. 165). After much intense debate, in 1998, both Estonia and Latvia did allow the children of “stateless” parents to receive citizenship, if born after August 21, 1991 in the case of Latvia, and February 26, 1992 in the case of Estonia (Schulze, 2018, pp. 142, 149). Implied in all of these debates and disputes is the Russian-speaking minority as constituted after the fall of the Soviet Union posed a threat to ethnic Estonians and Latvians.

Ukraine’s relationship to Russian ethnicity and language is somewhat more complex than that of the Baltic states. Like the Baltic states of Estonia and Latvia, around 30-percent of Ukrainians identify as primarily Russian speakers, and many Russian speakers are those closer to the Russian border, and in annexed areas like Crimea. Unlike Estonian and Latvian, whose language groups are distinct from the Russian language, the Ukrainian and Russian language share a Slavic base and the use of the Cyrillic alphabet. Roughly 60-percent of all Ukrainians understand both languages, or use both with some regularity. Additionally, Ukraine took a different approach from Estonia and Latvia when sorting out citizenship policy. While the Baltic states stressed the acquisition of the indigenous (or non-Russian) languages among people living in the territory, Ukraine adopted a more pluralist approach. Becoming a Ukrainian citizen following the collapse of the Soviet Union meant simply residing there: it was open to all nationalities (Duncan, 1996, p. 199). While many Ukrainian speakers can understand Russian and vice versa, the 2022 invasion has renewed interest among some Russian-speaking Ukrainians to learn and use Ukrainian almost exclusively. In an interview with Radio Free Europe/Radio Liberty (RFE/RL), one Russian-speaking respondent stated: “I suddenly realized that we’re living in Ukraine, in our country, but speaking a different language – the language of an occupier” (Zhukova 2023). A June 2023 law passed by the Rada (Ukrainian parliament) has banned Russian-language books for import from Russia, any book printed in Belarus or, any text published in the occupied territories. Even books not imported from those areas, but written in Russian nonetheless, would need special permissions before such a book could enter Ukraine. “The adoption of this draft law,” said Culture minister Oleksandr Tkachenko “will protect the Ukrainian book publishing and distribution sector from the destructive influence of the '[R]ussian world’” (Reuters, 2023). In short, the threat Russia poses is not only one of proximity, but also one of identity. While many Russian-speaking minorities have integrated into the larger societies of the Baltics and Ukraine, participating in social and political life, for example, others have

chosen not to. Such populations are therefore more prone to be seduced by the Russian government's view of the Baltics or Ukraine as the "ungrateful" nations. The next section details how issues of historical memory and commemoration itself threaten the social cohesion of society, and pose additional threats to the region.

Historical Memory: Removing Monuments and Reimagining History

In December 2022, in the Ukrainian city of Kramatorsk, in the Donetsk region, a monument to Russian poet Aleksandr Pushkin was removed by the local mayor. "Here is a place for our [Ukrainian] heroes, our culture and history..." the mayor said. (2022). By April 2023, nearly two dozen Pushkin statues had been taken down throughout Ukraine. While this struck even some liberal Russians as odd – Pushkin himself was exiled to Ukraine as a young writer for criticisms of the Russian government – other Ukrainians saw Pushkin as "a synecdoche for the Russian culture as a whole: take down Pushkin's statue and you are challenging Russia as a whole" (De Waal, 2023, np). Estonia's moving of the Bronze soldier, something of an icon for Russian-speakers living in Estonia, touched off several days of unrest in Tallinn, and led eventually to the cyberattack of Estonia in 2007. More recently, the removal of a World War II-era Soviet tank and the further removal of seven other Soviet monuments led to protests in border city of Narva, Estonia (Olsen, 2022). In 2022, the Latvian parliament passed a bill which allowed for the removal of any monuments or commemorations which celebrated "totalitarian," regimes, obliquely referring to statues raised during the Soviet occupation (Filseth, 2022). Several months later, Latvian demolition crews began removing a Soviet-era monument in Riga, which brought forth criticisms from Russian-speakers in those communities also (Olsen, 2022). In Lithuania, in May 2022, in a small town south of Vilnius called Merkine, a 2-meter high statue of a Soviet soldier was removed from its perch (Fürstenau, 2022).

Before the fall of the Soviet Union, the Baltic states and Ukraine were not in a position to control how history was to be remembered. The Soviet Union – with its educational initiatives, forced migrations, and cultural dominance – made national identity formation among Estonians, Latvians, Lithuanians, and Ukrainians challenging. When the Soviet Union collapsed, each country was free to explore those questions, and cast praise (and blame), where needed. For the first time in nearly 50 years, they got to choose who the "heroes" and "villains" in their story were. The invasion of Ukraine in 2014 and renewed aggression in 2022 – leading to full-scale war -- also marked a turning point for formerly occupied countries. Malinova argued that, "in the last 10-15 years, the conflicts over frames of remembering the tragic events of the twentieth century," were renewed among Eastern Europeans, and became a focal point in their foreign policy strategies, especially as Russian aggression manifested itself in the cyberattack on Estonia, and military involvement in Georgia and Ukraine (Malinova, 2021, p. 1002). It also impacted how each of these countries thought about historical remembrance and commemoration.

Commemoration has indeed been a prominent part of the broader story of collective memory. As Maria Mälksoo has pointed out, the Baltic states (and Poland), "have emerged in the vanguard of the so-called 'new European' commemorative politics, demanding the inclusion of their wartime experiences in the pan-European remembrance of war" (Mälksoo, 2009, p. 654). She describes this a "pluralizing the ways of being European" and [inserting] "a moment of radical heterogeneity" (Mälksoo, 2009, p. 656). And as Eva-Clarita Onken has

argued, European memory politics began to increasingly – if not somewhat begrudgingly – include perspectives from the Baltics and Ukraine, producing publications that condemned the “crimes of totalitarian communist regimes” and asserted the need to “morally assess and unambiguously condemn the crimes committed” in Central and Eastern Europe. (Onken, 2007, p. 30-31). This more inclusive context of how we remember is still of central importance to understanding much of modern politics in the Baltics and Ukraine. “Collective memory,” wrote Meike Wulf, “constitutes a repository of shared cultural resources (such as language), which guarantees continuity of a group. Change lies in the continuous process of reconstruction, reinterpretation and selection of these cultural resources; in the how and what is remembered at any point in time” (Wulf, 2016, p. 12). Historical commemoration through monuments is one way in which cultural memory is preserved but also propagated. In the movement and destruction of monuments, it is implied, for example, that these Soviet soldiers are not who they were purported to be. They were not the heroes.

While many Soviet-era statues and monuments were removed following the 1991 collapse, the continued occupation of Ukraine and the second invasion in 2022 renewed interest in ridding the Baltics and Ukraine of all traces of a Russian or Soviet past. In particular, such moves have been heavily criticized by Russia and Russian-speakers, particularly the removal of monuments depicting the Soviet “victory” over Nazism in World War II. As Jelena Subotić points out in her excellent book *Yellow Star, Red Star*: “World War II remembrance practices in postcommunist Europe, especially in the countries of the former Soviet Union, cannot be properly understood without taking into consideration the role Russia continues to play as a memory entrepreneur in the region” (Subotić, 2019, p. 16). The term “memory entrepreneur” denotes the very real, and very intentional measures the Russian government takes to ensure protection of its legacy.

Of course, it could be argued that removing monuments is simply an act of revenge, or that in doing so you lose the ability to discuss history more fully. As Lithuanian scholar Violeta Davoliūtė argued following the removal of the Merkine statue: “You could use the statue to explain and present complicated history” (Fürstenau, 2022). And as Mälksoo noted: “The political use of the past is hardly specific to totalitarian and authoritarian systems.” (Mälksoo, 2015, p. 11) Democratic regimes, just like authoritarian ones, have an interest in creating narratives that foster trust and warm-feelings about the nation. As Mälksoo, continues, though, she does note that authoritarian and totalitarian governments have a way of presenting history that is not malleable or able to be contested. “[T]heir attempts to mold and manipulate the way people remember,” she wrote, “and relate to their pasts can be distinguished from less sinister ways of ‘engaging the public’ by their level of repressiveness, utter denial of plurality, and the underlying belief in the possibility of remaking human nature” (Mälksoo, 2015, p. 12). In this vein, removing (or moving) Pushkin or the Bronze Soldier is necessary to combat narratives that do not allow for contested perspectives. Former historian and Estonian Prime Minister Mart Laar argued that while Germany, for example, went to great lengths to address its troubled past during World War II, Russia “still refuses to acknowledge historical facts, not to mention apologizing for the injustice committed” (Laar as cited in Hashimoto 2016, p. 174). And as Karsten Brüggeman and Andres Kasekamp pointed out in their essay on memorialization in Estonia: “[Vladimir] Putin’s regime seemed intent on bolstering Russian

nationalism, making particular use of the Great Patriotic War to strengthen Russian pride. After the tribulations of recent history, the victory over Nazi Germany in the Second World War is the one event that forms a central component of contemporary Russian identity and can serve to unite Russians” (Brüggeman & Kasekamp, 2008, p. 437).

Such monuments glorifying the Russian or Soviet cause can serve in their own way as a type of “threat” to local communities. Monuments can be seen and touched, one can take pictures of it or with it, and such sites can be places for gathering and memorialization. As a way to combat such Soviet commemoration, all three Baltic states and Ukraine have built museums and monuments to the victims of the Soviet Union. This includes the Museum of Occupations and Freedom Fights, in Vilnius, the Museum of the Occupation of Latvia, in Riga, the Museum of Occupation and Freedom, in Tallinn, and the Museum of Soviet Occupation, in Kiev.³ Additionally, a recent project in Estonia called “The International Museum for The Victims of Communism,” housed in a former prison in Tallinn, “will introduce crimes committed by both the Soviet and Nazi regimes.”⁴

Additionally, as Dovilė Budrytė has pointed out, diaspora communities themselves became a transnational repository for cataloging the abuses of the Soviet system and memorializing its victims. Using what she describes as the trauma-drama, Budrytė noted how the Lithuanian diaspora in the West was adamant in using the “vocabulary of the ‘genocide’ to describe the deportations and political repression under Stalin” (Budrytė, 2014, p. 172). While the term ‘genocide’ is used judiciously by academics to describe the deliberate and systematic elimination of a group of people, it has not stopped Balts from using this term to describe their (or their families) treatment during Soviet occupation. Simo Mikkonen also noted the role played by émigré communities outside of Estonia and the threat such a group posed to Soviet authorities. For Mikkonen, “... the Estonian emigration was considered a threat due to its uncontrolled collective memory of the Estonian past and resulting interpretation of the present” (Mikkonen, 2014, p. 79). One particular case involved a literary display in Sweden. Following a public program by members of the Estonian diaspora community at the Royal Library of Sweden, the Estonian Communist Party sent historian Leida Loone to Stockholm to curate a collection of titles perhaps more sympathetic to Soviet interests (Mikkonen, 2014). Both Budrytė’s and Mikkonen’s examples demonstrate the power that memory has, and the potential threat counter-narratives posed to the Soviet Union.

Soviet and Post-Soviet Memory Politics in Russia

Like Balts and Ukrainians, the break-up of the Soviet Union allowed for new narratives to be constructed for Russians living near and abroad as well. But the early 1990s in Russia was a period of upheaval. While Russians were free to make sense of the past without political intermediaries, the political and economic collapse of the 1990s in Russia allowed little time for such memory construction, and perhaps made others more sentimental for a bygone era.

³ This is not an exhaustive list of all exhibits and memorials, but provides a small window into the work of de-Russification of museum and memorials in the region.

⁴ *About the project - International Museum for The Victims of Communism (redterrormuseum.com)* [Accessed 6 July, 2023]

Putin's ascension to power would greatly impact remembrance in Russia, led in part by institutions he helped to either design, or that his government would finance. Under the auspices of the Putin regime, a number of institutions meant to foster pride in Russia and Russianness were created, including the development of the Alexander Gorchakov Public Diplomacy Foundation, the Russkiy Mir Foundation, and the Historical Memory Foundation. Such organizations connect Russians and others outside of Russia to positive impressions of the Russian state, promotion of Russian language and culture, and Russian interpretations of a "correct" history (Simons, 2014, pp. 4-5). The Russkiy Mir Foundation in particular established a playbook of sorts for Putin's vision of the world order, and the Historical Memory Foundation was led by Aleksandr Dyukov, a well-known skeptic of the Soviet atrocities committed in the Baltic states.

A particularly interesting case which highlights Russia's general approach to memory is Ekaterina Klimenko's work exploring the lack of commemoration on the 100th anniversary of the 1917 revolution. Klimenko argued that because the revolution did not easily translate into a helpful narrative for President Putin, events commemorating the anniversary were muted. However, a group called Russia--My History, developed in part with the Russian Orthodox church, has sought to turn "Russia's politically problematic revolutionary past into a politically usable one" (Klimenko, 2020, p. 2). This was a very fraught enterprise. Putin himself has called the collapse of the Soviet Union, "the greatest geopolitical disaster of the 20th century," and yet, the very act that created the Soviet Union, the 1917 revolution, evokes memories of dissidents and traitors among Russians. Instead, Russia--My History has focused on national heroes such as the Romanov dynasty and the soldiers of the Great Patriotic War (World War II). In this commemoration, Stalin is presented as a flawed but consequential figure, while Lenin and Trotsky as "destroyers... of the church and state" (Klimenko, 2020, p. 6). Remarkably, noted Klimenko, the Bolsheviks as a group are seen as Russia's saviors, while individual revolutionary actors are viewed more skeptically. "In this ever-repeating drama, (tragic) internal dissent brings on (disastrous in its consequences) failure of the state; however, when the former is overcome (always after unthinkable loss and suffering), the latter returns to its greatness" (Klimenko, 2020, p. 7). In today's telling, for Russia--My History, Putin is the inevitable savior for the current generation, and the Russian Orthodox church plays the role of important memory actor.

Two additional examples from the research of Masha Gessen demonstrate Russia's recalcitrance to deal with historical memory in a way that challenges the state. The first example is the that of the "Memorial" project, which began in the mid-1980s during the Perestroika era. The Memorial group sought to preserve the memory of those victimized by the Soviet state. With the Soviet collapse, Memorial had unprecedented access to once closed-off archives, such as the KGB files. Since 2007, for example, Memorial engaged in "The Return of the Names," an attempt to read the name of every person killed by the Soviet regime. But in 2022, Memorial was shut down. Putin considered Memorial to be a "foreign agent," and the names of several people who were on Memorial's rolls as victims were deemed to be Nazi collaborators, becoming a public embarrassment for the group. Memorial is no longer active.

A second illustration of contemporary Russia's inability to wrestle with challenging historical events comes from Gessen's and photographer Misha Friedman's excellent book *Never Remember: Searching for Stalin's Gulag in Putin's Russia*. In the book, Gessen argued

that Russia has not fully accounted for the traumas inflicted on Russian society by the Gulag. Gessen recalled Victor Shmoyrov, a historian who devoted his life to restoring the Gulag known as Perm-36. It took him and his spouse, Tatyana Kursina, over twenty years to complete the renovation, which soon housed what came to be known as the Sawmill Festival. The Festival, which was organized for singers and artists, drew close to 15,000 attendees. The repurposing of a site of presumed terror to one which could attract jubilant attendees for art or music may seem jarring, but Shmoyrov's and Kursina's purpose for the festival was to reinvigorate the underground spirit of Russian society, creating an annual event that was "part NGO congress, part political prisoner reunion, part rock concert, [and] part curiosity" (Gessen & Friedman, 2018, p. 96).

But an odd thing happened at the Sawmill festival. Increasingly, the festival (and the Perm-36 site) became a cosplay for Stalinists and Soviet nostalgists. Attendees came dressed as Joseph Stalin, and pictures of Laverntiy Beria, Stalin's main henchman, began to appear at the festival. Monies reserved for creating a museum centered around the Gulag dried up, the Perm mayor lost his job, and a new exhibit was developed by the Russian authorities in its place. In this new exhibit, which Gessen toured, the Gulag became neither a place of terror, nor delight. It stood to represent nothing. "The problem with the exhibit," Gessen noted, "is not inaccuracy or inauthenticity. Nor does it glorify the Gulag, as people claimed. The problem is cacophony. How is one to understand a story that tells one, in essence, that great people spent time here, that conditions were bad but got better, that it's a good thing that they couldn't escape, and that the ability to forget is a blessing?" (Gessen & Friedman, 2018, p. 107). This "cacophony," Gessen goes on to note, "conveys the sense that the Gulag meant everything and nothing... [it] says in effect, that it just happened, whatever" (108).

Contested Histories in the Baltics and Ukraine

While Russia has sought to minimize debates about significant historical moments and figures in Russian and Soviet history (or reconstruct narratives out of whole cloth), in the Baltics and Ukraine, persistent questions related to the interwar period and World War II are still being debated by historians, scholars, and political officials. Whether it is the question of Nazi collaboration, or the circumstances surrounding the Holodomor in Ukraine, scholars in the Baltics and Ukraine have worked adamantly to make sense of numerous complicated historical questions. However, at a time where national unity and building consensus is critical for Balts and Ukrainians, Russia has seen this as opportunity to sow discord in the media and general public, highlighting the region as fascists, bandits, and neo-Nazis. Two crucial examples expose Russian attempts to manipulate memory for their purposes: the legacy of the Baltic forest brothers, and the memory of the Holodomor. In one case, Russia attempts to muddy the waters by painting with a broad brush (the forest brothers); while in the second case (the Holodomor), it seeks to dismiss a tragedy as a mere misunderstanding, or overreaction on the part of the victims.

The forest brothers were anti-Soviet partisans (or resistance fighters) who were active in fighting for Baltic independence from 1940 through the early 1950s. All three Baltic countries had such a resistance. Lithuania's and Latvia's numbered over 30,000 members, with Estonia's resistance considerably smaller, perhaps less than 10,000 all told. The term forest brothers was coined because of their primary base of operation – the dense forests of the three countries.

Because of a lack of “internal mobility and external support,” forest brothers’ groups were largely overmatched by the Soviet forces following World War II, though reports of individual forest brothers remaining in the woods into the 1970s were sometimes documented (Taagepera 1993). The collapse of the Soviet Union enabled each country to paint a more complete picture of Baltic history during the occupation period, including stories of heroic Estonians, Latvians, and Lithuanians who had fought valiantly to resist occupation. The prevailing narrative of the forest brothers is that of brave patriots, fighting the good fight for their respective nation.

Russia has no doubt taken aim at this narrative in press releases and social media activity. In 2018, when NATO released a documentary short lionizing the forest brothers, Russian social media accounts (in Russian and English) pounced, alleging that the forest brothers were not who Balts purported them to be. “From the perspective of the Russian government, the forest brothers were Nazi collaborators... and should be remembered as traitors, more so than heroes” (Ellis, 2022, p. 36). The example of the forest brothers is a perfect case study for investigating disinformation, a tried and true tactic of the Russian government. Disinformation, as defined by the European Commission, is “all forms of false, inaccurate, or misleading information designed, presented and promoted to intentionally cause public harm or for profit” (Kapantai, et. al 2020, p. 2). The key word in this definition is intentional. Unlike misinformation, which is wrong information but not intended to be malicious, disinformation campaigns exist to articulate a particular narrative or point of view.

One of the most pressing questions of historical memory in the Baltics is how to best understand the treatment of Jews in the region and whether such Russian allegations amount to mis- or disinformation. While most focus has been on Soviet occupation narratives, following the collapse of the Soviet Union, Estonia and Latvia created historical commissions to investigate “crimes against humanity” which occurred on Estonian and Latvian soil. Eva-Clarita Pettai’s comparative analysis of these commissions reveals that both countries attempted to make sense of their complicity in these atrocities, and while she believed that “fact-finding” missions were largely successful, neither country fully wrestled with this complicated history (Pettai, 2011, pp. 168, 172). “The Holocaust, i.e. the suffering of a local minority with the help of members of the majority population,” Pettai wrote, “did not fit into a general narrative of national victimhood, open and hidden resistance to foreign occupation and lost statehood” (163). Pettai noted that Estonian secondary teachers hardly ever used prepared texts related to the Holocaust in Estonia, and when it was discussed, Nazi and Soviet crimes were grouped together as “one of several genocides” to be understood (172). This issue of conflation of the occupations fueled Dovid Katz’s research into what he called the “double-genocide.” His well-known and controversial article which investigated Lithuania primarily, noted how equating the Holocaust with crimes of the communists – or worse yet, saying communists were more evil -- effectively takes Balts off the hook for their own collaboration with Nazis.

As is well-documented in all three Baltic countries, some anti-Soviet partisans participated in atrocities against Jews. Subotić’s work on Lithuania highlights the “almost complete absence of accounting for massive Lithuanian complicity in the destruction of its Jews” (Subotić, 2019, p. 203). In Latvia, the Arājs Commandos, led by Viktors Arājs, was responsible for the death of 26,000 Jews and Gypsies, and in Estonia, the *Omakaitse*, an Estonian security and police force, worked closely with Germans in arresting and killing Jewish

Estonians (Ellis, 2022, p. 47). As Davoliūtė argued: “[F]or the deeds of the forest brothers to serve as an ethical and political compass... it is essential that this period is addressed lucidly and in its full complexity” (Davoliūtė 2017, 8).

This period of Baltic history is indeed quite messy and complicated. During a period of three different occupations, first Soviet, then Nazi, then Soviet again, Baltic people were tasked with making difficult decisions about loyalties. While accepting that Estonians, Latvians, and Lithuanians did participate in atrocities during this time, Kasekamp, for example, resists the term collaborator in part because Balts “had little opportunity to make morally untainted choices between two evils” (Kasekamp, 2018, p. 121). Most forest brothers did not participate in such acts, but some did. It is in this space that arguments about the “correct” historical narrative exist, and where Russian memory wars can best prosper. The collaboration and neo-Nazi narrative, for example, became a pretext for the Russian invasions of Ukraine in 2014 and 2022, with Putin publicly commenting: “We are again and again forced to repulse the aggression of the collective West. It is unbelievable but it is a fact: we are again being threatened by German Leopard tanks, emblazoned with crosses. And we are again going off to fight on the soil of Ukraine, against the forces of Hitler's last descendants, against the forces of the Banderites” (Griffin, 2024, p. 88).

While how to remember and honor the forest brothers may still be something of a contested matter even among Baltic historians, the trauma surrounding the Holodomor (a Ukrainian word which means to “kill by starvation”) in Ukraine are known and well-understood. Between 1932-1933, a starvation campaign by Josef Stalin resulted in the deaths of somewhere between 4-6 million Ukrainians. While modern scholarship on the issue readily documents the event, “between 1933 and 1991, the USSR simply refused to acknowledge that any famine had ever taken place,” going so far as to destroy local records and other archives of the period (Applebaum, 2017, p. XXX). Following the collapse of the Soviet Union, Ukrainians renewed efforts to investigate in greater detail the traumas of the Holodomor and sought ways to memorialize the victims. “Among the consequences of the birth of civil society,” Menon and Rumer write, “was the exploration of historical topics... on which there was a mandatory official line” (Menon & Rumer, 2015, p. 18). Western scholarship, such as Robert Conquest’s *The Harvest of Sorrow* (1986), articulated what many Ukrainians already believed: not only that the Holodomor happened, but that it was planned (Motyl 2010). Viktor Yushchenko, Ukraine’s third president, the leader of the Orange Revolution, and arguably its most nationalist president to that point, made commemoration of the Holodomor a major piece of administration, calling the famine a “state-organized program of mass starvation” (Menon & Rumer, 2015, p. 40).

While there is widespread agreement on many of the facts surrounding the Holodomor and what this era meant for Ukrainians, there is still a rich and ongoing research agenda about questions related to intentionality, cause and effect, the perpetrators, and the extent of its “genocidal essence” (Grynevych, 2008, p. 19-20). Russia and Russian-speakers in Ukraine have not always approached these questions with the same level of nuance, however. In 2006, a Ukrainian historian of the Holodomor named Volodymyr Kalininchenko had his doors kicked-in in protest of his scholarship by Russian nationalists. In 2015 and 2016, news articles on Russian-backed sites like Sputnik News argued that the Holodomor was nothing more than a fiction of Ukrainian “Nazis” and their Western sympathizers (Applebaum, 2017, pp. 420, 424).

And most notably, upon inauguration in February 2010, Ukrainian president Yanukovich – a Russian speaker with roots in Donetsk – ordered that documentation of the Holodomor on the president’s official website be stricken from the record. This is what scholar Alexander J. Motyl has called “deleting the Holodomor” (Motyl, 2010, p. 25). Like a Pushkin statue, the Holodomor itself has become something of a symbol for how to make sense of Ukrainian identity, and how to remember. Are you with the Russians, or with “us?”

Conclusions

By the end of 2023, it was not only Pushkin statues that were the source of discontent in Ukraine, but statues and memorials dedicated to a host of Russian nationals were taken down, or approved for removal. This included Russian nobleman Prince Vorontsov’s memorial removed in Odessa, and “a statue to the Red Army commander Mykola Shchors, a monument to a crew of a Bolshevik armored train, and a Soviet river warship named after the Russian sailor Anatoli Zhelezniakov,” all removed in nation’s capital, Kyiv. (Court 2023). And it is not only the content of the statues that are significant, but also where the removals were taking place. In the Donetsk region, in Crimea, and in cities like Zaporizhzhia and Kharkiv, where Pushkin statues and others are being dismantled, there are large Russian-speaking populations, many of whom remain under occupation. Monuments in a city like Narva, Estonia, for example, which borders Russia and has a large Russian-speaking population, have been the target of removal before and after the invasion of Ukraine. The decision to remove such statues appears not only to be opportunistic on the part of Ukrainians and Balts, but also strategic. If you can reframe Ukrainian and Baltic history in a way that excludes Russian narratives, can you regain independence? Can you begin to feel safe again?

Deborah Stone, in her classic *Policy Paradox: The Art of Political Decision Making*, argues that, “[s]ecurity and insecurity are feelings or psychological states. Objective circumstances influence these feelings, but to the individual, security is ultimately a feeling” (Stone, 2012, p. 133). How individuals – and subsequently states – perceive their own security, greatly influences the approach domestic political actors take when dealing with threats or enemies. Because threat perception is not necessarily an objective endeavor, owing to feelings and perception, the manner in which one processes threats is varied. In this essay, I argued that threats in the Baltic states and Ukraine can be both material *and* abstract – owing to the construction of contested memories – by differing memory actors and institutions. While the Russian military is still large and possesses nuclear capabilities, for example, threats may also include certain statues or monuments in a local community, or a press release arguing that your local heroes are perceived Nazis. Using the international relations literature, one can see how approaches stressing ontological security and constructivism reimagine threats to be less material, and more abstract, historical, or ideational in content.

Broadening the European story to include the traumas of Baltic and Ukrainian participants has been an ongoing effort of politicians and activists in the region since the collapse of the Soviet Union. Siobhan Kattago points out that this has essentially created three different memory regimes in Europe in relation to trauma and history: a) the Western narrative about the evil of the Holocaust; b) the Soviet and Russian narrative as liberator of Eastern Europe from the Nazis; and c) the post-communist narrative regarding the two occupations and

two evils of communism and Nazism (Kattago, 2009, pp. 7-8). Kattago argues that such memory disputes might require political actors to “agree to disagree” on certain moments of history. But as Nobuya Hashimoto points out, how can you agree to disagree if the other side (Putin, in this case), refuses to acknowledge certain elements of history, through obfuscation, evasion, or outright denial (Hashimoto, 2016, p. 179)?

The cases of the forest brothers and the Holodomor are therefore relevant to consider in light of these differing memory regimes. A political project from the Baltic or Ukrainian perspective which uncritically analyzes the forest brothers or the Holodomor – or the removal of statues and memorials -- may be useful for the regime, but could be considered unsatisfactory not only from a scholarly perspective and also undemocratic. To further Hashimoto’s idea, such an effort would mimic the playbook of Putin and his advocates: if history is uncomfortable, just “delete” it. But not all Baltic and Ukrainian scholars want to do this, and this is where academic freedom for scholars, historians, and curators becomes immensely important. In short, interpreting Russian history as threatening is normal, perhaps even logical, but allowing for tough conversations in social, educational, and political settings is needed.

While it is important to be mindful of the very real costs of war – the physical destruction and the lives lost – Russia’s threat extends beyond that which is measured militarily. Since the fall of the Soviet Union, Russian leadership has posed threats to the Baltics and Ukraine by fomenting uneasiness in the region in an attempt to sow division and discord. This is accomplished by the stoking of ethnic tension, in particular through the commemoration and memorialization of Soviet and Russian history on Russian terms, the waving away of Soviet atrocities committed on Baltic and Ukrainian soil, and the seamless weaving of a narrative that identifies Russia as the saviors of Balts and Ukrainians. The Baltic states and Ukraine have fought back, so to speak, removing those threats in the forms of monuments and crafting their own history to combat Russian narratives. While imperfect, the Balts have done this at a time when their own histories have been contested, forming historical commissions and public hearings to make sense of World War II, the treatment of Jews, and their own role in the Holocaust. All the while, Russia under the leadership of Putin has either been unable or unwilling to wrestle with complicated elements of Russian history. Perhaps the greatest threat Russia poses today is its inability to look inward, call out past mistakes, and find ways to move forward.

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