**Irina Bilan • Constantin-Marius Apostoaie • Elena Rusu Cigu**

(editors)

# FINANCIAL AND MONETARY POLICIES FOR FOSTERING EUROPEAN INTEGRATION

*Proceedings of the EUconomics International Conference*

Jean Monnet Module
"Towards New Paradigms of EU Economics: Financial and Monetary Milestones"
EUCONOMICS
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# THE INFLUENCES OF TAXATION AND OF OTHER MACROECONOMIC INDICATORS ON THE ENTERPRISES AT EUROPEAN UNION LEVEL

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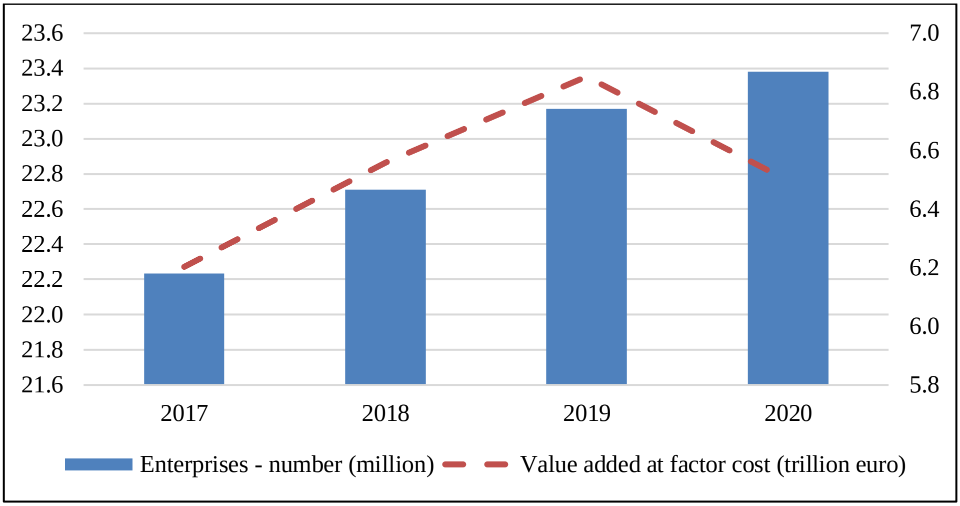
**Abstract**
*Enterprises represent the development engine of any economy, and the governments of the world want to support businesses by improving access to markets, promoting skills, reducing bureaucracy, strengthening the dialogue between employers and the state, last but not least, governments propose the adequacy of corporate taxation not only to cover budgetary needs but also for the development needs of companies. Thus, at the level of the European Union, although the largest share of companies is small and medium-sized enterprises, all companies are seen as applicants and beneficiaries of a business environment that allows them to develop harmoniously over time. Taxation plays an important role, a problem that imposes increasing constraints on companies can lead them to avoid paying taxes and finally even exit from the market, while a low or relatively adequate level of corporate taxation can stimulate them to develop and maybe even attract new companies to that regional market. In this sense, the article tries to trace the connection between a series of indicators regarding the evolution of businesses such as Net return on equity, after taxes, of non-financial corporations and Business demography survival rate after two years, in relation to indicators of the company's taxation, but also of the macroeconomic indicators such as economic growth, inflation, employment and the ability to connect and use the Internet by employees. The study is an econometric one with panel data for EU27 countries and covers the period 2010-2022. The results aim to reveal a series of strengths, but also shortcomings of the factors presented above, which influence the performance of companies at the EU27 level, also suggesting a series of proposals for political decision-makers, especially regarding taxation.*
**Keywords:** *corporate income tax; demography and performance of European Union companies; influencing factors.*
**JEL Classification:** H25, H32, L2

## 1. INTRODUCTION

The recovery of the European Union (EU 27) from the economic crisis of COVID-19 is relatively slow and may prove fragile in the context of the outbreak in early 2022 of the war in Ukraine. In addition to the gradual return to a sustainable fiscal system (with budget fiscal deficits and reduced public debts) and to a stable financial-banking system in the face of crises, European companies are the key to the sustainable recovery of the economy. Thus, EU policies must take into account, more and more, the effects not only at the macro level, but also at the micro level, at the level of companies, of phenomena such as the aging of the population and waves of international migration, of the pressure regarding the reduction of fossil resources and high energy prices, climate change and soil aridity in particular, but also the fastest possible transition to a green economy. Thus, if we look at the beginning of the COVID-19 crisis, it graphically shows us that although the number of non-financial companies at the EU27 level was increasing in 2020, the added value was still reduced at the level of 2018 (see Figure 1), a situation also felt by the European employees.




Source: author's processing based on Eurostat data

**Figure 1. Annual enterprise statistics[1] – number of firms and value-added in the European Union with 27 countries**

In 2019, 98.9 % of EU businesses were micro or small enterprises and they contributed just over one third (35.3 %) of the value added. Also, the 43 000 large enterprises represented just 0.2 % of the total number of enterprises and generated a share of 47.6 % of value added in the EU27 economy (European Commission, 2022).

In this sense, taxation plays an important role in the promotion and survival of businesses, in ensuring an appropriate return for shareholders and in ensuring

[1] There is considered the total business economy; repair of computers, personal and household goods; except financial and insurance activities.

a competitive environment. The corporate income tax rate, through its impact on investments, can undermine a company's ability to obtain increased returns and can have negative effects on productivity, especially in the case of small companies (Romero-Jordán and Sanz-Sanz, 2019), with investment capacities that are already reduced compared to large companies. A taxation inadequate to the market conditions, including with increased rates (Baurer, 2005), can create fiscal burdens on companies that will ultimately be reflected in the final price of the products purchased by European consumers. Thus, the taxation system can have for firms (especially, small and medium-sized enterprises) a dual role: as a tool to assist in overcoming their challenges, but also, as an obstacle (OECD, 2015).

Thus, the article tries to highlight the connection between a series of indicators at the company level such as: Net return on equity, after taxes, of non-financial corporations and Survival rate of the enterprises after two years and Top statutory corporate income tax rates and other macroeconomic indicators (economic growth, inflation, employment and the ability of employees to use technology and internet infrastructure).

## 2. LITERATURE REVIEW

The relationship between taxation and the performance of companies, especially regarding SMEs, is quite limited, generally dealing with regions or countries in Asia or Africa. At the EU level, in Roman *et. al.* (2023), the aim of the authors was to discover the relationship between the taxes that SMEs must also pay for their performance, focusing on European Union countries. Grouped by clusters, their findings (Roman *et al.*, 2023) highlighted that the taxes paid by SMEs significantly influence their performance, but these influences differ significantly depending on the specifics of the countries considered and the specifics of the entrepreneurial activity in particular countries.

The analysis of corporate taxation is multifaceted, there is the perspective of the company, but also of the state, there is the perspective of preserving the company's yield, but also of fiscal efficiency, or the perspective of rents, but also of fiscal equity, etc.

Some studies at the EU level (Bauer, 2019) focus on the analysis of the fairness of the corporate taxation system, emphasizing that the current system of international corporate taxation is fundamentally flawed and in need of substantial reform. Other studies seek to combat the erosion of the tax base and the transfer of profits across borders, by proposing minimum corporate tax levels, thus in the study of Aslam and Coelho (2021), it is examined the role of minimum taxes and the attempts to quantify their impact on economic activity, using a panel dataset that catalogues changes in minimum tax regimes over time around the world. In their study (Aslam and Coelho, 2021), firm-level analysis suggests that the introduction or reform of a minimum tax is associated with an increase in the average effective tax rate of just over 1.5 percentage points with respect to turnover and of around 10 percent with respect to operating income.

In general, the studies that connect the taxation of companies with profitability and investments emphasize that that lower corporate tax rates stimulate a similar increase in investment (e.g., Ohrn, 2018, on a study on firm's effective corporate income tax rate related to financing and investment in the United States).

If we take into account on whom the incidence of corporate taxes falls, the studies analyse the situations, considering commercial integration and capital mobility, in which the incidence falls on the shareholders or on the workers, decreasing wages (McKenzie and Ferede, 2017; Fuest, Peichl, and Siegloch, 2018), but also the way of translation in the price of the products, so the consumers will bear the higher corporate taxes (Baker, Sun, and Yannelis, 2020; Dedola, Osbat and Reinelt, 2022). After-tax returns to capital can be reduced by high corporate tax rates, and thus affect shareholders (Harberger, 1962; Auerbach 2006). The corporate tax incidence is reduced on capital, and it increases on wages, when elasticity of substitution of products is low (Gravelle, 2013; Dedola, Osbat and Reinelt, 2022).

## 3. METHODOLOGY

This paper investigates the impact or rather the connections between some indicators regarding the evolution of businesses such as: Net return on equity, after taxes, of non-financial corporations (NREAT) and Business demography survival rate after two years (SurvivR2), in relation to macroeconomic indicators and an indicator of the company's taxation such as Top statutory corporate income tax rates (including surcharges) (TSCIT). The macroeconomic indicators are: economic growth (RGDPGR), inflation (HICPIR), employment rate (ER) and the ability to connect and use the Internet by employees (EUCI). The description and the source of date are presented in Table 1.

**Table 1. The description of the variables and sources**

| The notation of variables | Variable description | Source |
|---|---|---|
| NREAT | Net return on equity, after taxes, of non-financial corporations | Eurostat |
| SurvivR2 | Survival rate 2: number of enterprises in the reference period (t) newly born in t-2 having survived to t divided by the number of enterprise births in t-2 - percentage | Eurostat |
| TSCIT | Top statutory corporate income tax rates (including surcharges) | EC, DG Taxation and Customs Union, based on Eurostat data |
| RGDPGR | Real GDP growth rate - volume | Eurostat |

| The notation of variables | Variable description | Source |
|---|---|---|
| HICPIR | HICP - inflation rate | Eurostat |
| ER | Employment rate by sex | Eurostat |
| EUCI | Use of computers and the Internet by employees by NACE Rev.2 activity | Eurostat |

Source: author's conception

The study covers the period 2010-2022 and is an econometric study with panel data for EU27 countries. The study uses extrapolations, interpolations and includes proxies for missing data, therefore the results must be viewed with some degree of due caution.

The regression models verified in this article are presented below:

NREAT= f(NREAT(-1), TSCIT, RGDPGR, HICPIR, ER, EUCI) (1)

SurvivR2= f(SurvivR2 (-1), TSCIT, RGDPGR, HICPIR, ER, EUCI) (2)

Generically, the equations are represented as:

$$\boldsymbol{Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon} \quad (3)$$

Where:
Y= the dependent variables chosen successively as NREAT and SurvivR2;
α = constant;
$\beta_{1\text{-}5}$ = slope of $x_1$-$x_5$ coefficients;
$x_{1\text{-}5}$ = the coefficients of the regression or the independent variables: TSCIT, RGDPGR, HICPIR, ER, EUCI;
ε= error term.

Table 2 presents the statistical description of the variables: the mean values of the variables, the median, the standard deviation, the skewness, as well as kurtosis.

The standard deviation, with some exceptions, shows in most cases close to the average, being below the average for the targeted explanatory indicators, except for RGDPGR and HICPIR. Thus, we can notice that the values are grouped around the average. Also, the mean and median are close in value of each other for all the predictive variables investigated, showing a relatively symmetrical distribution.

**Table 2. The statistical description**

| | NREAT | SURVIVR2 | TSCIT | RGDPGR | HICPIR | ER | EUCI |
|---|---|---|---|---|---|---|---|
| Mean | 21.80986 | 69.97316 | 22.37473 | 2.152659 | 2.314150 | 70.80161 | 42.76888 |
| Median | 16.51000 | 70.05000 | 21.00000 | 2.200000 | 1.700000 | 72.00000 | 40.40000 |
| Maximum | 235.5500 | 134.2100 | 44.40000 | 24.40000 | 19.40000 | 81.80000 | 81.10000 |
| Minimum | -60.01000 | 29.47000 | 10.00000 | -11.30000 | -1.600000 | 52.50000 | 15.00000 |
| Std. Dev. | 18.91008 | 11.96999 | 7.026638 | 3.675981 | 2.975537 | 6.478495 | 14.40214 |
| Skewness | 4.465714 | 0.671773 | 0.201237 | 0.094015 | 2.717801 | -0.502631 | 0.455877 |
| Kurtosis | 50.44239 | 6.886118 | 2.418686 | 8.188307 | 12.73249 | 2.475957 | 2.615675 |
| Jarque-Bera | 34084.30 | 247.2653 | 7.311214 | 394.2006 | 1817.407 | 18.79565 | 14.31789 |
| Probability | 0.000000 | 0.000000 | 0.025846 | 0.000000 | 0.000000 | 0.000083 | 0.000778 |
| Sum | 7655.262 | 24560.58 | 7853.530 | 755.5833 | 812.2667 | 24851.37 | 15011.88 |
| Sum Sq. Dev. | 125156.9 | 50148.20 | 17280.77 | 4729.494 | 3098.837 | 14689.81 | 72597.62 |
| Observations | 351 | 351 | 351 | 351 | 351 | 351 | 351 |

Source: author's processing based on Eurostat data

Considering the skewness, we notice that the independent variables: TSCIT, RGDPGR and EUCI are above the value of 0 and less than 0.5, which indicates that they are roughly skewed, the ER is negative, so it is skewed adversely, only HICPIR is above 1, which means that it is substantially and positively skewed.

The kurtosis is above 3 for RGDPGR and HICPIR, which indicates that the distribution is leptokurtic, producing more extreme values than a normal distribution. For TSCIT, ER and EUCI, the distribution is less than 3, so it is platykurtic, having less extreme values and a fewer than a distribution that is normal.

## 4. RESULTS

In Table 3 – in the correlation matrix – it is shown that all of correlation coefficients are well below 0.75, which could suggest this is not the case for the multicorrelation problem between variables.

From the correlation matrix we observe that the explanatory variables generally have a weak correlation with the dependent variable, so the Net return on equity, after taxes, of non-financial firms is little affected by the proposed variables, but TSCIT (Top statutory corporate income tax rates) has a stronger correlation with it than the selected macroeconomic independent variables. The SurvivR2 has stronger correlations with EUCI (Use of computers and the internet by employees) and ER (Employment rate). With ER the correlation of SurvivR2 is negative suggesting generally the opposite direction action between independent and dependent variable, and a pressure from labour market on companies survival. The negative correlation with the inflation rate may suggest that, in adverse times with high inflation, the capacity of surviving of the firms is reduced. As expected, the degree of computer and Internet use by employees (EUCI) can be an additional positive factor in ensuring the survival of companies at the EU27 level.

**Table 3. The correlation matrix of dependent and independent variables**

| | NREAT | SurvivR2 | TSCIT | RGDPGR | HICPIR | ER | EUCI |
|---|---|---|---|---|---|---|---|
| **NREAT** | 1 | | | | | | |
| **SurvivR2** | -0.041 | 1 | | | | | |
| **TSCIT** | 0.179 | 0.088 | 1 | | | | |
| **RGDPGR** | 0.082 | 0.021 | -0.161 | 1 | | | |
| **HICPIR** | 0.002 | -0.067 | -0.107 | 0.150 | 1 | | |
| **ER** | 0.080 | -0.103 | -0.048 | 0.184 | 0.176 | 1 | |
| **EUCI** | 0.027 | 0.197 | 0.310 | 0.013 | 0.078 | 0.519 | 1 |

Source: author's calculations based on Eurostat data

Table 4 demonstrates that all of the variables utilized in this investigation are stable at order 1.

**Table 4. Unit root test**

| Variables tested for ADF | T-statistic | Mackinnon critical value at 5% | P-value | Order of integration | Observation |
|---|---|---|---|---|---|
| NREAT | -18.5564 | -2.8697 | 0.0000 | I(1) | Stationary |
| SurvivR2 | -17.4971 | -2.8696 | 0.0000 | I(1) | Stationary |
| TSCIT | -19.3543 | -2.8696 | 0.0000 | I(1) | Stationary |
| RGDPGR | -8.3976 | -2.8699 | 0.0000 | I(1) | Stationary |
| HICPIR | -11.5411 | -2.8699 | 0.0000 | I(1) | Stationary |
| ER | -5.4091 | -2.8699 | 0.0000 | I(1) | Stationary |
| EUCI | -19.2868 | -2.8696 | 0.0000 | I(1) | Stationary |

Source: author's calculations based on Eurostat data

In Tables 5, 6, 7 and 8, there are presented the results and their assessment regarding heteroskedasticity, multi-collinearity. Thus, we can consider that the models used in this study are firm and appropriate. For multi-collinearity the VIF values are less than 10, which mean that no interconnectivity can be considered between the independent variables. Tables 5 and 7 present the selected final equations results, connecting the dependent variables with the independent ones: TSCIT, RGDPGR, HICPIR, ER and EUCI.

The R-squared of 0.198471 for NREAT (Net return on equity, after taxes, of non-financial corporation), and of 0.544600 for SURVIVR2 (Survival rate 2: number of enterprises in the reference period (t) newly born in t-2 having survived to t divided by the number of enterprise births in t-2) are relatively moderate, but they indicate a positive relationship. As a result of this finding, it is possible to conclude that the independent variables determine moderately the evolution of the followed company indicators.

The F-statistics p-value is less than 5%, indicating that the models are acceptable. The p-value under 0.05 is only suitable for the TSCIT (Top statutory corporate income tax rates) in explaining the evolution of the NREAT (Net return on equity, after taxes, of non-financial corporation).

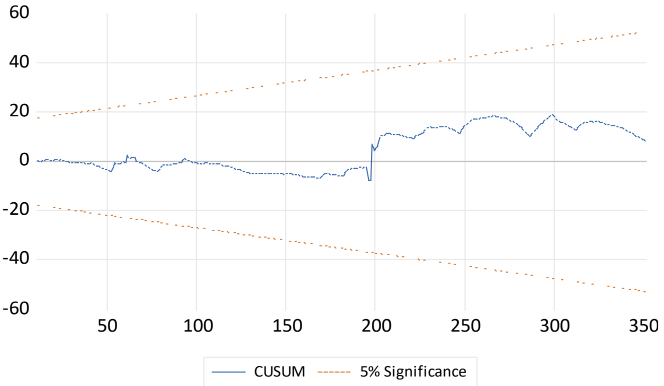
**Table 5. The Regression equation results for Net return on equity, after taxes (NREAT)**

| Dependent Variable: NREAT | | | | |
|---|---|---|---|---|
| Method: Least Squares | | | | |
| Date:03/29/23 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -8.777410 | 11.624230 | -0.755096 | 0.4507 |
| NREAT(-1) | 0.383195 | 0.049548 | 7.733788 | 0.0000 |
| TSCIT | 0.426295 | 0.146610 | 2.907676 | 0.0039 |
| RGDPGR | 0.402441 | 0.258109 | 1.559188 | 0.1199 |
| HICPIR | 0.040351 | 0.315725 | 0.127805 | 0.8984 |
| ER | 0.227291 | 0.175762 | 1.293169 | 0.1968 |
| EUCI | -0.101647 | 0.081131 | -1.252872 | 0.2111 |
| R-squared | 0.198471 | Akaike info criterion | | 8.535718 |
| Adjusted R-squared | 0.184450 | Schwarz criterion | | 8.612876 |
| F-statisc | 14.155390 | Hannan-Quinn criter. | | 8.566430 |
| Prob(F-statistic) | 0.000000 | Durbin-Watson stat | | 2.085611 |

Source: author's calculations based on Eurostat data

**Table 6. The Assessment of results for Net return on equity, after taxes (NREAT)**

| Fact-findings verifications | F - Statistics | P-value | Result analysis | Observations |
|---|---|---|---|---|
| Ramsey RESET - Stability test | 6.3525 | 0.1222 | p>0.05 | Firm model |
| Heteroskedasticity Test: Breusch-Pagan-Godfrey | 1.6020 | 0.1457 | p>0.05 | No Heteroskedasticity |

| Multi-Collinearity test for initial equation | Coefficient variance | Centered VIF | Result analysis | Observations |
|---|---|---|---|---|
| TSCIT | 0.0215 | 1.2605 | VIF<10 | No interconnectivity of independent variables |
| RGDPGR | 0.0666 | 1.0775 | VIF<10 | No interconnectivity of independent variables |
| HICPIR | 0.0997 | 1.0564 | VIF<10 | No interconnectivity of independent variables |
| ER | 0.0309 | 1.5510 | VIF<10 | No interconnectivity of independent variables |
| EUCI | 0.0066 | 1.6343 | VIF<10 | No interconnectivity of independent variables |
| CUSUM test |  | | | |



Source: author's calculations based on Eurostat data

For the SURVIVR2 (Survival rate 2), the p-value under 0.05 can be seen only for ER (Employment rate by sex) and EUCI (Use of computers and the internet by employees by NACE Rev.2 activity), which makes them good predictors for the evolution of SURVIVR2.

It should be noted that, if the other explanatory variables have a positive correlation with the survival rate of companies, the same cannot be said about the Top statutory corporate income tax rates (TSCIT), which, although it does not have a coefficient much different from zero, still has a correlation negative with the survival rate of companies. This aspect says that, upon a rearrangement of the model, so that taxation becomes relevant for the survival of companies (a p-value below 0.05), the increase of the upper rate of the corporate tax can lead to the decrease of the survival capacity of the companies.

**Table 7. The Regression equation results for Survival rate 2 (SurvivR2)**

| | | | | |
|---|---|---|---|---|
| Dependent Variable: SURVIVR2 | | | | |
| Method: Least Squares | | | | |
| Date:03/29/23 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 31.523480 | 6.533363 | 4.825000 | 0.0000 |
| SURVIVR2(-1) | 0.682184 | 0.037604 | 18.141160 | 0.0000 |
| TSCIT | -0.064559 | 0.067357 | -0.958453 | 0.3385 |
| RGDPGR | 0.135541 | 0.120868 | 1.121399 | 0.2629 |
| HICPIR | 0.142388 | 0.147943 | -0.962452 | 0.3365 |
| ER | 0.184800 | 0.084085 | -2.197783 | 0.0286 |
| EUCI | 0.121511 | 0.039210 | 3.098952 | 0.0021 |
| R-squared | 0.544600 | Akaike info criterion | | 7.018253 |
| Adjusted R-squared | 0.536633 | Schwarz criterion | | 7.095412 |
| F-statisc | 68.36389 | Hannan-Quinn criterion | | 7.048965 |
| Prob(F-statistic) | 0.000000 | Durbin-Watson stat | | 2.003618 |

Source: author’s calculations based on Eurostat data

The Granger causality test (see Table 9) with a probability below 0.05, shows that rather the influence comes from independent indicators on each other, and close to the level of 0.05, but above it is the Granger cause of TSCIT on NREAT. This is suggesting that the taxation of companies is an indicator that may influence the Net return on equity, after taxes, of non-financial corporations in the future. It should be noted that inflation (HICPIR) has the highest incidence on the other independent variables, Granger causing TSCIT, ER, RGDPGR and EUCI. This aspect once again raises before the monetary authorities the need for a good controllability of the increase in prices in the economy and of its reflection, direct and indirect, at the level of the real economy.

**Table 8. The Assessment of results for Survival rate 2 (SurvivR2)**

| **Fact-findings verifications** | **F - Statistics** | **P-value** | **Result analysis** | **Observations** |
|---|---|---|---|---|
| Ramsey RESET - Stability test | 2.527486 | 0.1128 | p>0.05 | Firm model |
| Heteroskedasticity Test: Breusch-Pagan-Godfrey | 2.134508 | 0.059 | p>0.05 | No Heteroskedasticity |
| **Multi-Collinearity test for initial equation** | **Coefficient variance** | **Centered VIF** | **Result analysis** | **Observations** |
| TSCIT | 0.0045 | 1.2134 | VIF<10 | No interconnectivity of independent variables |
| RGDPGR | 0.0146 | 1.0776 | VIF<10 | No interconnectivity of independent variables |
| HICPIR | 0.0219 | 1.0579 | VIF<10 | No interconnectivity of independent variables |
| ER | 0.0071 | 1.6189 | VIF<10 | No interconnectivity of independent variables |
| EUCI | 0.0015 | 1.7410 | VIF<10 | No interconnectivity of independent variables |
| CUSUM test |   | | | |

Source: author's calculations based on Eurostat data

**Table 9. The Granger Causality Test Results**

| Pairwise Granger Causality Tests | | |
|---|---|---|
| Date:03/29/23 | | |
| Sample:1351 | | |
| Lags 2 Obs. 349 | | |
| **Null Hypothesis:** | **F-Statistic** | **Prob.** |
| TSCIT does not Granger Cause RGDPGR | 3.48871 | 0.0316 |
| HICPIR does not Granger Cause TSCIT | 6.55217 | 0.0016 |
| HICPIR does not Granger Cause RGDPGR | 6.88085 | 0.0012 |
| HICPIR does not Granger Cause ER | 104.605 | 3.E-36 |
| HICPIR does not Granger Cause EUCI | 29.4358 | 2.E-12 |
| RGDPGR does not Granger Cause HICPIR | 44.0918 | 9.E-18 |
| RGDPGR does not Granger Cause EUCI | 7.60669 | 0.0006 |
| ER does not Granger Cause HICPIR | 8.56866 | 0.0002 |

* Only results with a probability below 0.05 are presented above.

Source: author's calculations based on Eurostat data

## 5. CONCLUSIONS

In the context of increasingly scarce resources for public budgets, of crises with a high degree of repetition, the reform of the taxation system is in perpetual actuality. In this sense, at EU27 level, the impact of corporate taxation on companies returns to public attention. Thus, the public discussion follows the controversy regarding ensuring the sustainability of public finances by adjusting tax rates and bases or by adjusting public expenditure. As public expenditures are in a perpetual expansion, against the background of challenges and risks, updating almost with an annual frequency, the adjustment of tax rates and the standardization of corporate taxation at the level of minimum rates at the global level seems an unavoidable reality for the near future.

Thus, the study, analysing on the basis of panel data, for the period 2010-2022, at the level of EU27 countries, analyses the impact of Top statutory corporate income tax rates and other important macroeconomic variables such as economic growth, inflation, employment, as well as the ability of employees to use computers and internet on Net return on equity, after taxes, of non-financial corporations and Survival rate of the enterprises after two years.

The results obtained after the regression analysis reflect the fact that Top statutory corporate income tax rates (TSCIT) have an influence on Net return on equity, after taxes, of non-financial corporations (NREAT) but not on Survival rate 2 (SurvivR2). On SurvivR2, two other variables have a significant influence: Employment rate (ER) and Use of computers and the internet by employees (EUCI).

The analysis of the correlations is also interesting. So, if on NREAT the explanatory variables have a weak but positive correlation, regarding the survival rate of the companies after two years, inflation and the employment rate have negative influences, although still limited. The use of technology, especially computers, and the Internet, has increased importance in terms of the survival capacity of companies, but it also contributes to the adequacy of the corporate taxation level and to the increase of the employment rate.

Regarding the authorities, the monetary authorities should intervene more actively and more promptly to stabilize prices and reduce inflation, and the fiscal authorities should take into account the setting of tax rates on the incomes of companies so that there is no translation of the tax rate increases on capital holders, on workers or on consumers, through the transfer of the tax increase in the price of products.

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# ARE YOU OPEN TO FORGIVENESS? INVESTIGATING SERVICE RECOVERY STRATEGIES IN THE BANKING SECTOR

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**Abstract**
*In the highly competitive banking sector, providing quality customer service is crucial for retaining customers and maintaining a positive reputation. However, despite the best efforts of banks to deliver flawless service, service failures can occur. Therefore, banks employ suitable strategies to recover from service errors and problems, encouraging customers to continue their transactions with the bank and expanding their tolerance zone level. As a result, this study explores the correlation between service recovery strategies (SRS) (compensation (COM), apology (AP), Empathy (EMP), customer forgiveness (CF), and repurchase intentions (RI) in the banking sector. A quantitative-based administrative questionnaire was used to statistically test the relationships between SRS, CF, and RI. The data was obtained from 190 banking customers in Alicante City, Spain, who had experienced a service failure and responded using a five-point Likert scale. Simple and multiple regression analyses were conducted to analyse the results. The findings indicate that SRS such as AP, COM, and EMP positively impact CF and RI. Additionally, a positive relationship was found between CF and RI. Furthermore, the results concluded that CF mediates the relationship between COM and RI.*
*The findings from the research can aid bank managers in formulating focused recovery strategies and attaining a competitive advantage. Consequently, this study provides concrete suggestions for banks to manage and operate banking services offered to their customers and effective service recovery strategies that enhance customer forgiveness behavior and repurchase intentions. The study highlights the significance of service recovery strategies in the banking industry and recommends investing in marketing strategies and campaigns to improve consumers' favorable attitudes toward the banks. Besides, it also highlights the relevance of customer forgiveness in the service recovery process. Consequently, it emphasises the importance of addressing this issue in the banking service recovery process, as it enhances customer repurchase intentions.*
**Keywords:** *service recovery strategies; customer forgiveness; repurchase intentions; banking sector; Spain.*
**JEL Classification:** M31, G21

## 1. INTRODUCTION

Delivering a "zero-defect" experience has been the most challenging problem for any service provider before the COVID-19 outbreak and in the two years after that (Florido-Benítez, 2022; Cusin and Flacandji, 2022). Therefore, problems can occur at any time or location during a service encounter due to a wide range of factors, both under the control of the service provider and those that are not (Koc, Boz and Boz, 2019). Consequently, because of these shortcomings, the provider experiences undesirable effects such as negative word-of-mouth (NWoM) (Chang and Cheng, 2021) and consumer switching behavior (Harrison-Walker, 2019). Furthermore, a consumer's repetitive encounters with service failure would likely exacerbate these undesirable consequences. According to Joireman *et al.* (2013), service failures are seen as unfortunate.

Therefore, the issue that banks need to pay attention to when competing is how to reduce the number of customer complaints and reports through appropriate service recovery procedures, reduce customer switching intentions, and further improve the service recovery quality to increase repurchase intention (RI). Consequently, by taking effective service recovery measures immediately after a service failure occurs, it is possible to improve the service recovery quality, realise customer satisfaction, and recover customer relationships, thereby inducing customers to repurchase and further preventing customer churn. Thus, according to the "service recovery paradox" proposed by many researchers, companies can achieve higher satisfaction by actively providing high-level service recovery measures to customers after intentionally making or neglecting service mistakes (Spreng *et al.*, 1995; Smith and Bolton, 1998; Ali and Mohamed, 2020).

Service recovery effectively reduces customer dissatisfaction by making up for service mistakes. Recently, however, more and more researchers are questioning the validity of the service recovery paradox. Buttle and Burton, (2002) found that customers' dissatisfaction remained despite receiving excellent service restoration measures. According to Magnini *et al.*, (2007), customer forgiveness (CF) rather than the timeliness of service restoration strategies (SRS) plays a key role in improving the service recovery quality in companies. Consequently, in an unavoidable service mistake, companies take service recovery measures to obtain customer forgiveness by eliciting the customer's internal response. Therefore, CF is the key for companies to improve service recovery quality in the long term, and it not only creates very high corporate value but also plays significant role in the present era in customer relationships, increasing RI and customer attraction.

Recovery strategies have been the subject of extensive scholarly research (Ali, 2022; Wang, Chih and Honora, 2023). However, recovery techniques rarely focus on the emotions of forgiveness that lead to RI. Consequently, it is still necessary to research how COM, APO, and EMP service recovery techniques affect repurchase intention through the mechanism of forgiveness.

Moreover, Wang, Chih and Honora, (2023) suggested employing different settings to search for these combinations and observe their impact on CF to explore the trade-offs among emotional and economic recovery tactics to see whether an ideal balance exists among them. Thus, the present research provided a theoretical understanding of how different service recovery mechanisms affect consumers' propensity to repurchase. Moreover, CF has been proposed as a mediator between SRS and consequences like RI (Li, Ma and Bai, 2020).

CF replaces negative feelings such as wrath or fears with more positive ones after thinking deeply about the injustice done and pondering appropriate responses (Berry and Worthington Jr, 2001). It has also been found that CF significantly allows consumers to lessen the negative emotions caused by lousy performance (Li, Ma and Bai, 2020). Moreover, the higher the service recovery quality, the more likely customers will experience positive emotions and develop stronger intents to purchase again. Thus, customers will find repurchasing reasonably simple (Xie, Qi and Zu, 2020). Additionally, banks must cultivate an atmosphere or "emotional climate" for their consumers and may engage with the brand's consumers and service suppliers and develop valuable networks and partnerships (Cropanzano and Dasborough, 2015).

This research aims to make a few significant contributions to the literature. First, this study contributed to the knowledge of service recovery techniques and repurchased intent in Spain. Second, this model stresses the significance of CF as a good feeling induced by customers who get COM, AP, and EMP from the banking sector in case of a service failure. Furthermore, the present study's conceptual framework is backed by Affective Events Theory (Weiss and Cropanzano, 1996). It describes how consumers react to the service recovery mechanisms deployed by service providers, with COM, AP, and EMP functioning as events. Besides, the incidents elicit an emotional reaction from CF, which is then used to complete the RI form.

## 2. LITERATURE REVIEW

In the following sections, we describe our study model and a set of hypotheses explaining the impact of SRS on CF and desirable intents and outcomes (RI). Specifically, the model explores the effect of COM, AP, and EMP as recovery techniques on intentions to forgive (CF) and RI. Furthermore, it further investigates CF impact on RI intended outcomes. In addition, the mediator influence of CF on the link between (COM, AP, EMP) and RI is investigated. Thus, beginning with the effect of service recovery measures on forgiveness, we next analyse the impact of CF on desired results.

### 2.1 COM and CF relationships

Companies may provide customers with financial resources to recuperate as compensation for a service failure (Smith, Bolton and Wagner, 1999).

Consequently, COM is considered an acceptable service recovery method (Hoffman, Kelley and Chung, 2003) and may be the most prevalent (Inyang, 2015). Walster, Berscheid and Walster, (1973) show that COM is meant to restore fairness to the links when one party has been harmed by the other. Moreover, a payment proposal might be a discount on future purchases, a product exchange, a complete or partial refund (Hui and Au, 2001), or a different product. Besides, it is very unusual for a restaurant owner to discount a meal, issue a ticket for a future visit, or provide a complimentary dessert to compensate for a poor service experience. Thus, it is considered that offering compensation conveys a message of respect (Conlon and Murray, 1996) and reflects an effort to overcome the loss (Walster, Berscheid and Walster, 1973; Tax, Brown and Chandrashekaran, 1998; Gelbrich, Gäthke and Grégoire, 2016). As a result, financial compensation enhances the organisation's dedication to the customer (Vázquez-Casielles, Iglesias and Varela-Neira, 2012).

Regarding CF, Vázquez-Casielles, Iglesias and Varela-Neira, (2012) propose that COM favorably influences post-purchase behavior intentions (such as repurchase probability and positive WOM) by diminishing the unpleasant emotions caused by the service failure experience. Consequently, this decrease in negative sentiment and good feelings toward the service provider illustrates customer forgiveness. Accordingly, COM is anticipated to have a favorable effect on CF.

Research has shown that even if a consumer gets a monetary COM, they may be unable to forgive their service provider entirely. Therefore, clients encounter several obstacles to overcoming anger or bad feelings that prevent them from obtaining forgiveness. Consequently, to verify the effectiveness of the COM, service providers may monitor customer replies throughout the process (Tsarenko, Strizhakova and Otnes, 2019). According to Xie, Qi and Zu, (2020) organisations with excellent customer service recovery attempts might elicit good consumer sentiments. Consequently, customers assess the swiftness and efficacy of the recovery and the tangibility of the compensation supplied. Therefore, when standard procedures such as return or exchange are inadequate to compensate for the service failure, actual compensation might ease consumers' bad emotions. Therefore, by giving a suitable amount of physical payment, such as coupons or cash refunds, businesses may successfully mend broken relationships with dissatisfied consumers, keeping them in the long run.

Consequently, this strategy is a tried-and-true method for service providers to lessen negative feelings and elicit good customer emotions. Moreover, if service providers use successful service recovery procedures, consumers will probably feel fewer negative and more pleasant emotions, resulting in enhanced customer satisfaction. Consequently, suggests that using compensation provision (COM) as a service recovery technique might result in emotional forgiveness (Babin, Zhuang and Borges, 2021a). As noted, the primary premise of the

Affective Events hypothesis Weiss and Cropanzano, (1996) is that an event induces an emotion in the affected person. In this instance, an event is the service recovery mechanism the brand applies as COM. Thus, the CF reaction is triggered when they regain the individual's monetary or non-monetary loss. Consequently, it is hypothesised:

**H1**. COM will positively influence CF.

### 2.2 AP and CF relationships

AP expresses corporate responsibility and regret (Conlon and Murray, 1996; Blodgett, Hill and Tax, 1997). According to Barlow and Møller (1996), AP expresses regret for an unfortunate event. Furthermore, apologising for the service failure enhances the customer's evaluation of the interaction by communicating civility, kindness, care, and effort to those who have suffered a service failure (Hart, Heskett and Sasser Jr., 1990; Kelley *et al.,* 1993; Smith, Bolton and Wagner, 1999). In addition, the victim's acceptance of AP is essential to obtaining forgiveness from the offended party (Kearns and Fincham, 2004; Friesen and Fletcher, 2007). Therefore, customers see that the company's expression of remorse and AP for the failure of the service is necessary for their forgiveness for this failure (Younger *et al.*, 2004; Barber, Maltby and Macaskill, 2005; Williamson and Gonzales, 2007; Exline *et al.*, 2008; Rapske *et al.,* 2010). According to Lazare (1997), AP is one of the most potent means of promoting healing and forgiveness. Thus, argue that the service recovery technique of apologising will have a favorable effect on CF.

Therefore, most customers choose sympathetic and apologetic service recovery tactics (Azemi *et al.*, 2019). Wei, Liu and and Keh, (2020) recommend that businesses provide honest apologies that kindly explain the circumstance to win consumer forgiveness. Moreover, Zhang *et al.,* (2020) propose that emotional and personal apologies drive consumer forgiveness more successfully than monetary compensation, as compensating tactics might be complicated and unsuitable in some settings (Harrison-Walker, 2020). In contrast, research indicates that when customers face money losses due to service failure, they prefer compensation-based coping techniques (Azemi *et al.*, 2019). In addition, the research emphasises the significance of enabling customers to express their concerns and negative comments, highlighting its power to generate constructive post-failure resolutions McQuilken and Robertson, (2011), according to the preceding and the findings of prior studies that emphasised the significant role of AP for service failure to customers in affecting CF. Therefore, can assume that AP positively affect CF for the mistakes of the service provided. Thus, the following hypothesis can be formulated:

**H2.** AP will positively influence CF.

### 2.3 EMP and CF relationships

The SOR theory can be used to explain the relationship between EMP and CF. Stimulus organisation response (S-O-R) theory asserts that the external world is a stimulus that influences individual cognition and emotion, affecting person behavior (Qiu *et al.*, 2021; Wei *et al.*, 2022). Stimulation refers to any external impact that might alter a person's psychological state and elicit a response. Thus, stimulation influences psychology through the receiver's awareness the recipient is an organism. Therefore, the organism generates a conscious or unconscious psychological reaction after being stimulated (Jacoby, 2002; Meilhan, 2019). Numerous academics use the S-O-R theory on consumer cognition, perception, and behavior intention (Escalas, 2004; Graessley *et al.*, 2019; Rydell and Kucera, 2021; Watson and Popescu, 2021). Consequently, this study is also appropriate for analysing the S-O-R theory. The purpose of the service recovery provided by the bank to the customer after the failure of the banking service is to excite the consumer and elicit empathy to encourage the establishment of CF and consumer RI. Consequently, the ability to accurately discern another person's present feelings is referred to as empathy, and it may encourage people to act with altruistic motives and promote prosocial conduct. Thus, its objective is to make other people's struggles easier and to improve their well-being (Batson, 2014). Therefore, EMP refers to consumers' emotional integration and connection with external stimuli that occur both consciously and unconsciously and shows up as passionate reactions to those stimuli (Escalas and Stern, 2003). Li *et al.*, (2016) feel empathy influences an individual's moral thinking style, but empathy is not the only component influencing ethical thought.

According to Enright, Gassin and Wu, (1992), CF refers to the victim's desire and actions to understand, be sympathetic to, and accept the perpetrator after being harmed by the offender. Furthermore, consumer forgiveness is a psychological process in which consumers demonstrate tolerance and understanding for service provider faults or reprehensible behavior by letting go of unpleasant emotions after experiencing banking service issues. Thus, this procedure seeks to increase CF propensity and enhance their bond with the service provider (Ho, 2020; Huang and Chang, 2020). Therefore, a person's cognitive, emotional, relationship quality and detailed aspects might influence their willingness to forgive others (Sun, 2012; Ran, Wei and Li, 2016). In addition, using a genuine personification approach after a catastrophe increases customers' propensity to forgive more than an ability brand personification strategy. Moreover, if customers already have a strong feeling of devotion towards the brand, the effect of the brand personification technique on consumers' readiness to forgive is diminished (Sun and Guo, 2019; Siamagka, 2023).

Babin, Zhuang and Borges, (2021a) verified that the perception of fairness influences behavioral forgiveness via emotional forgiveness by conducting empirical research on older American customers (55 years and older). Moreover, Bast and Barnes-Holmes, (2015) conducted a cross-cultural and cross-situ empirical investigation and concluded that EMP is a key factor in helping individuals forgive one another somewhat, even when they engage in unpleasant conduct. Furthermore, in the service recovery context, Wei, Liu and Keh, (2020) demonstrated that emotional healing has a more significant impact on evoking consumers' empathy and forgiveness towards service providers than economic recovery. Consequently, when a service failure occurs, effective service recovery strategies can foster empathy in consumers, leading them to consciously diminish negative feelings such as resentment and the desire for revenge while promoting greater forgiveness and kindness (McCullough *et al.*, 1998). Sun and Sun, 2021) used the study frameworks of attribution, S-O-R theories, and empirical research to establish that consumer empathy significantly impacts their propensity to forgive. Thus, in the context of service recovery in banking, when customers demonstrate empathy for the bank, they can better appreciate the underlying reasons for service failures and are more forgiving of the bank's conduct. Based on these data, the following hypothesis has been developed:

**H3.** EMP will positively influence CF.

## 2.4 COM and RI relationships

COM is a required recovery method used in service settings to mitigate the loss of consumers that may result from a service failure (Liu *et al.*, 2019). Therefore, this method entails providing consumers vouchers, refunds, or discounts, which are more cost-effective and allow customers to see the brand as having value after an unpleasant encounter. Consequently, it increases repetition intentions (RI) and other good behavioral intents (Jeong and Lee, 2017). According to Tang *et al.*, (2018), when provided by the responsible firm, economic COM may help mitigate consumers' negative reactions to a service failure, favorably influencing their RI. In addition, Xie, Qi and Zu, (2020) discovered that COM in the form of coupons, refunds, or other compensation proportional to the customer's loss might successfully restore the brand-customer connection, resulting in a favorable change in consumer attitude and behavior. Based on these observations, the following hypothesis may be developed:

**H4.** COM will positively influence RI.

## 2.5 AP and RI relationships

According to Liu *et al.*, (2019), AP is a formal declaration that expresses remorse and acknowledges a failure or transgression. Therefore, the service provider must apologise to anyone impacted in a service failure. Consequently, by apologising, the service provider takes responsibility for any customer complaints or difficulties, which may result in good sentiments and customer satisfaction, eventually having a favorable effect on the customer's desire to repurchase (RI).

Therefore, successfully deploying service recovery techniques is essential for customer retention and purchasing intentions (Ali, Gilal and Shah, 2018). Moreover, AP is the most cost-effective service recovery solution for service failure. Thus, a true and heartfelt apology may evoke favorable attitudinal and behavioral reactions from consumers, such as RI (Jung and Seock, 2017). According to Tang *et al.*, (2018) consumers are more likely to express powerful emotions after a service failure if the firm truly apologises, resulting in a rise in RI. Thus, AP to consumers fosters a good connection with them, resulting in beneficial consequences such as repurchase behavior (Li, Ma and Bai, 2020). In addition, Sciarelli *et al.*, (2017) demonstrated that when a business swiftly apologises, consumers tend to display good intentions, such as repurchasing and continued patronage. Based on these observations, the following hypothesis may be developed:

**H5.** AP will positively influence RI.

## 2.6 EMP and RI relationships

EMP is the ability to comprehend, recognise, and react to the thoughts, behaviors, feelings, and experiences of others (Murray, Elms and Curran, 2019). In light of this, EMP might be considered a multifaceted concept involving affective, cognitive, and compassionate perspectives (Powell and Roberts, 2017). In addition, EMP describes how customer service representative conducts themselves while listening to client concerns (Liao, 2007). As a result, customers may become more at ease, more satisfied, and more likely to make repeat purchases from businesses. Additionally, empathy-based behavior enables customers to openly share the firm's shortcomings in delivering high-quality services, allowing the firms to better please customers by promptly addressing their complaints. Therefore, previous studies have found that companies that excel in EMP are more likely to generate higher customer repurchase intentions (Alzoubi *et al.*, 2020). Based on these observations, the following hypothesis may be developed:

**H6.** EMP will positively influence RI.

## 2.7 CF and RI relationships

When a customer buys a product or service, their emotions are triggered, and if they feel favorable emotions, they are more likely to purchase the same brand again. Conversely, customers may stop buying from that brand if they have unfavorable feelings. Xie, Qi and Zu, (2020) noted that changes in customer emotions significantly impact their intentions and behavior regarding online purchases. Therefore, according to the literature on consumer behavior, brand forgiveness occurs when a customer wishes to preserve a connection with the brand despite the company's failure. Consequently, this motivates consumers to maintain brand loyalty, demonstrate a readiness to make future purchases and suggest the firm, mainly when a service recovery approach generates good feelings. Therefore, consumers may show either good responses, such as forgiveness and repurchase, or negative reactions, such as complaints and switching (Babin, Zhuang and Borges, 2021b). Tsarenko, Strizhakova and Otnes, (2019) offer data supporting the link between CF, RI, and other outcomes. In addition, Waheed and Khan, (2019) found that CF substantially influenced RI and had a modest effect on different results. According to the Affective Events theory (Weiss and Cropanzano, 1996), emotions produce behavioral or attitudinal responses. Thus, once people acknowledge the feeling, they respond to the experience with a particular action or attitude.

According to Wang, Zhang and Wong, (2022), customer purchase intention refers to a consumer's propensity to acquire a product or service. On the other hand, consumers' RI relates to their likelihood to continue buying items or services from a particular company. Thus, it often includes repeat purchases and readiness to promote Zeithaml, Berry and Parasuraman, (1996). Therefore, customers who are psychologically committed to buying a brand's goods for a certain amount of time in the future do so when they develop a feeling of attachment or dependence on those goods. Zhang *et al.*, (2020) show that forgiveness favorably impacts customers' desire to make repeat purchases.

Moreover, some studies have shown that CF greatly influences RI based on the service recovery situation (Huang and Chang, 2020). In this case, CF is an emotion that resulted in the behavioral response of RI. Based on these observations, the following hypothesis may be developed.

**H6.** CF will positively influence RI.

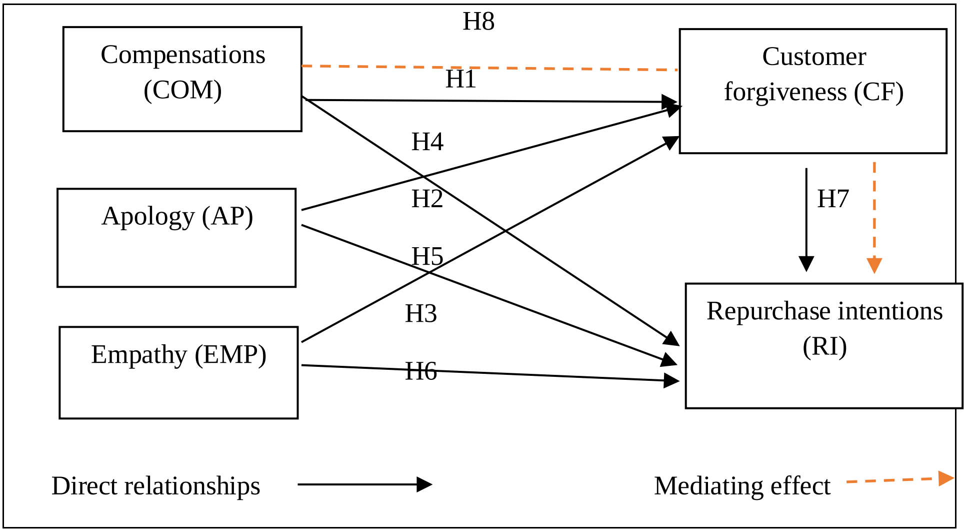
### 2.8 SRS and CF, and RI relationships

CF can mediate the relationship between SRS and RI. Therefore, Huang and Chang, (2020) investigated the function of CF as a mediator between customers' perceptions of justice and their future banking activity in the Pakistani banking sector. In contrast, a different study confirmed their hypothesised relationship between CF serving as a mediator between SRS and positive behavioral outcomes among the participants, and it recommended incorporating CF as a mediator in future service recovery studies (Harrison-Walker, 2019). Thus, CF has been highlighted as a possible result of unpleasant experiences in marketing literature, and characteristics that influence CF have been discovered. Tsarenko, Strizhakova and Otnes, (2019) investigated the effects of service recovery activities by firms on CF and confirmed forgiveness's moderating effect on customer loyalty. According to the Affective Events Theory Weiss and Cropanzano, (1996), an experience cannot cause a behavioral or attitude reaction. Before forming an attitude or conduct, it's vital to identify the underlying emotional process. In the context of service recovery techniques such as AP, COM, and EMP, the event induces in persons the feeling of CF, which functions as a mediator.

Consequently, the consumer's propensity to intend a repurchase is the subsequent behavioral reaction. Quan and Li, (2021) found that CF is a significant mediator between RI and characteristics such as attribution, severity, brand trust, intimacy, and empathy. Consequently, when customers forgive a service breakdown in the context of banking service recovery, their repurchase intent improves. Additionally, the introduction of service recovery techniques has an indirect effect on CF. According to previous discussions, it can be hypothesised that CF can mediate the link between SRS and RI. Hence CF is hypothesised as a mediating mechanism:

**H8.** SRS (COM, AP, EMP) will indirectly affect RI by mediating CF.

Figure 1 depicts a suggested model for establishing hypotheses based on theoretical considerations and explaining the causal link between the researched variables. Consequently, this model explores the connection between the three-dimensional service recovery strategies (COM, AP, EMP) and CF and RI. Besides, the research examined the impact of CF on SRS with RI. Therefore, increasing consumer complaints about the banking industry's inability to satisfy their demands served as the background for this study. For this investigation, the following model was established:




Source: the author

**Figure 1. Model of the study**

## 3. RESEARCH DESIGN AND METHODS

The quantitative study was conducted to verify the relationship between the components of SRS (COM, AP, and EMP), CF, and RI. Moreover, demonstrates the impact of CF on the link between SRS and RI. Therefore, due to the importance of complaints management in the banking industry, the study focused on customers of Spanish banks who had experienced service failures or filed complaints regarding inadequate service provision. Consequently, this industry was selected because customer retention is crucial for bank survival and expansion. Moreover, despite being a significant and expanding sector within service firms, financial service providers often receive reports of problems and mistakes in service delivery. The research population comprised clients who had undergone the service recovery process after filing complaints about service interruptions.

Furthermore, purposive sampling was employed to gather data from Spanish bank customers who met the inclusion criteria. Besides, Web-based questionnaires were used to collect data, and the questionnaires were modified from previous research to suit the current investigation. The questionnaire was chosen because it is based on actual marketing transactions, has better generalizability and higher external dependability, and allows for evaluating essential factors.

Additionally, it is a convenient, fast, and cost-effective method for obtaining respondent replies (Churchill and Iacobucci, 2006; Fresco *et al.*, 2007). Moreover, data were collected from 190 bank customers using a questionnaire consisting of 25 questions. In addition, to ensure that responses belonged to the desired audience, screening questions (4, 5, and 6) were used to determine if respondents were linked to a bank, had previously encountered a service failure, or had filed a complaint against the bank. Thus, the respondent could not finish the questionnaire if any of these questions were answered negatively. These questions helped recall service failures and recovery occurrences, and their responses to the remaining questions were record. In addition, the questionnaire included data on the kind of bank the respondent uses (public or private), the nature of their account (individual, business, or joint), and complaints. Moreover, other demographic questions include age, gender, and educational levels. The research variables were evaluated using an scales except for demographic questions.

All variables use literature-based scales, which are briefly discussed below. Regarding the service recovery strategies, most of the measuring items for the dimensions of SRS were taken or altered from another research. Overall, 11 questions were utilised to measure the SRS, adopted 4 items to measure COM (Liao, 2007; Varela-Neira, Vázquez-Casielles and Iglesias, 2010; Bradley and Sparks, 2012). Moreover, 4 more to measure AP (Liao, 2007; Bradley and Sparks, 2012), and 3 items used to measure EMP adopted from (Boshoff, 2005; Kau and Loh, 2006; Liao, 2007; del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009). Moreover, 4 items were used to measure CF adapted from (Finkel *et al.*, 2002; Zhang *et al.*, 2020). Moreover, 4 items to measure RI were adopted (Zeithaml, 2000; Bacile *et al.*, 2018).

A 5-point Likert scale was used to measure the responses, and each question in the survey was rated on a scale of 1 to 5, where 5 represented "strongly agree," and 1 represented "strongly disagree." Moreover, the survey was divided into two parts, with the first consisting of demographic variables and the second questions about SRS, CF, and RI. The participants were characterised by being young and well-educated. Moreover, the researcher used objective and rigorous measurements to establish the study variables to ensure the questionnaire's validity and reliability. Furthermore, Cronbach's alpha, a reliable measure of questionnaire validity and reliability, was utilised with a score close to +1, indicating greater precision.

Additionally, descriptive statistical techniques were employed to describe the sample characteristics. Furthermore, simple and multiple linear regression analyses (stepwise) were utilised to test the research hypotheses, utilising SPSS v25. Besides, the survey's reliability was evaluated using composite reliability, which should be greater than (0.70). Consequently, the rate is more than 0.70, showing internal consistency. Cronbach's alpha was used to assess internal consistency. As the value Cronbach's alpha (0.841) so, these data support the reliability of the study. Thus, findings indicate the validity and reliability of the measurement tool and its statistical validity for collecting field study data.

## 4. RESULTS' DISCUSSION

### 4.1 Sample profile

The demographic information revealed the overall composition and features of the research participants and (47.4%) of respondents were male, while (52.6%) were female. Most respondents were between the ages of 21 and 30 (42.6%), followed by those more than 40 (26.8%), followed by those between 31-40 (18.4%) and 18 to 20 (12.1%). Regarding the education level, the majority (45.8%) had a bachelor's degree, while (38.9%) held a postgraduate degree, and (15.3%) held a high school diploma. Most responders were well-educated, and each participant in this survey qualified for the research. Table 1 provides descriptive information on respondent characteristics.

**Table1. Demographic statistics**

| **Gender** | **Frequency** | **Percentage** |
|---|---|---|
| Male | 90 | 47.4 |
| Female | 100 | 52.6 |
| **Age** | | |
| 18-20 | 23 | 12.1 |
| 21-30 | 81 | 42.6 |
| 31-40 | 35 | 18.4 |
| More than 40 | 51 | 26.8 |

| **Gender** | **Frequency** | **Percentage** |
|---|---|---|
| **Education** | | |
| High school | 29 | 15.3 |
| Bachelor's degree | 87 | 45.8 |
| Postgraduate degree | 74 | 38.9 |

Source: results of the author's study

### 4.2 Data analysis

This part provides the outcomes of validating and testing the hypotheses and statistical methodologies. Hypothesis H1 test the effect of COM on CF and is examined using simple regression analysis. Table 2 presents the simple regression analysis results.

**Table 2. Simple regression analysis for the effect of COM on CF**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.556[a] | 0.310 | 0.306 | 0.67204 |

a. Predictors: (Constant), COM

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 38.075 | 1 | 38.075 | 84.305 | .000[b] |
| | Residual | 84.907 | 188 | 0.452 | | |
| | Total | 122.982 | 189 | | | |

a. Dependent Variable: CF b. Predictors: (Constant), COM

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.029 | 0.300 | | 3.432 | .001 |
| | COM | 0.869 | 0.095 | 0.556 | 9.182 | .000 |

a. Dependent Variable: CF

Source: results of the author's study

Table 2 presents an overview of the simple regression analysis findings conducted to investigate the impact of COM on CF, showing that the prediction model was statistically significant ($F = 84.305$, p-value $< 0.01$), with 0.310% of CF variability (R Square = 0.310) explained by the positive effect of COM (Beta = 0.556, T = 9.182). As a result, the positive impact of COM on CF is expected. Consequently, indicates that H1 is supported. The H2 hypothesis states that AP has a positive effect on CF. Therefore, using simple regression analysis, this hypothesis was tested. Table 3 presents the results of the analysis.

**Table 3. Simple regression analysis for the effect of AP on CF**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.653[a] | 0.426 | 0.419 | 0.78248 |

a. Predictors: (Constant), AP

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 7.875 | 1 | 7.875 | 12.863 | .000[b] |
| | Residual | 115.107 | 188 | 0.612 | | |
| | Total | 122.982 | 189 | | | |

a. Dependent Variable: CF
b. Predictors: (Constant), AP

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.647 | 0.311 | | 8.500 | .000 |
| | AP | 0.751 | 0.098 | 0.653 | 3.586 | .000 |

a. Dependent Variable: CF

Source: results of the author's study

Table 3 presents an overview of the simple regression analysis findings conducted to examine the impact of AP on CF, showing that the prediction model was statistically significant (F = 12.863, p-value < 0.01), with (0.426%) of CF variability (R Square = 0.426) explained by the positive effect of AP (Beta = 0.653, T= 3.586). As a result, the positive influence of AP on CF is expected. Consequently, indicates that H2 is supported. The H3 hypothesis states that EMP positively affects CF, so this hypothesis was tested using simple regression analysis. Table 4 presents the findings of the analysis.

**Table 4. Simple regression analysis for the effect of EMP on CF**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.618[a] | 0.381 | 0.378 | .63614 |

a. Predictors: (Constant), EMP

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 46.904 | 1 | 46.904 | 115.904 | .000[b] |
| | Residual | 76.079 | 188 | 0.405 | | |
| | Total | 122.982 | 189 | | | |

a. Dependent Variable: CF
b. Predictors: (Constant), EMP

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.178 | 0.243 | | 4.847 | .000 |
| | EMP | 0.786 | 0.073 | 0.618 | 10.766 | .000 |

a. Dependent Variable: CF

Source: results of the author's study

Table 4 presents an overview of the simple regression analysis findings conducted to investigate the influence of EMP on CF, showing that the prediction model was statistically significant (F = 115.904, p-value < 0.01), with (0.381%) of CF variability (R Square = 0.381) explained by the positive effect of EMP (Beta = 0.618; T= 4.847). Therefore, the positive impact of EMP on CF is expected. Consequently, H3 is supported. H4 hypothesis that examines the influence of COM on RI. Simple regression analysis was used to test this hypothesis. Table 5 presents the results of the analysis.

**Table 5. Simple regression analysis for the effect of COM on RI**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.579[a] | 0.335 | 0.331 | 0.69884 |

a. Predictors: (Constant), COM

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 46.253 | 1 | 46.253 | 94.709 | .000[b] |
| | Residual | 91.814 | 188 | 0.488 | | |
| | Total | 138.067 | 189 | | | |

a. Dependent Variable: RI
b. Predictors: (Constant), COM

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.277 | 0.312 | | 0.890 | .375 |
| | COM | 0.957 | 0.098 | 0.579 | 9.732 | .000 |

a. Dependent Variable: RI

Source: results of the author's study

Table 5 presents an overview of the simple regression analysis findings conducted to investigate the influence of COM on RI, showing that the prediction model was statistically significant (F = 94.709, p-value < 0.01), with 0.335% of RI variability (R Square = 0.335) explained by the positive effect of COM (Beta = 0.579; T= 9.732). Therefore, the positive influence of COM on RI is expected. Thus, indicates that H4 is supported. Additionally, simple regression analysis was used to test the H5 hypothesis, which examines AP influence on RI. The findings of the simple regression analysis are shown in Table 6.

**Table 6. Simple regression analysis for the effect of AP on RI**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.613[a] | 0.375 | 0.371 | .80505 |

a. Predictors: (Constant), AP

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 16.223 | 1 | 16.223 | 25.031 | .000[b] |
| | Residual | 121.844 | 188 | 0.648 | | |
| | Total | 138.067 | 189 | | | |

a. Dependent Variable: RI
b. Predictors: (Constant), AP

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.695 | 0.320 | | 5.291 | .000 |
| | AP | 0.703 | 0.101 | 0.613 | 5.003 | .000 |

a. Dependent Variable: RI

Source: results of the author's study

Table 6 presents an overview of the simple regression analysis findings conducted to investigate the influence of AP on RI, showing that the prediction model was statistically significant (F = 25.031, p-value < 0.01), with (0.375%) of RI variability (R Square = 0.375) explained by the positive effect of AP (Beta = 0.613; T= 5.003). Therefore, the positive influence of AP on RI is expected. Thus, this indicates that H5 is supported. Additionally, simple regression analysis was used to test the H6 hypothesis, which examines EMP influence on RI. The findings of the simple regression analysis are shown in Table 7.

**Table 7. Simple regression analysis for the effect of EMP on RI**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.497[a] | 0.247 | 0.243 | 0.74373 |

a. Predictors: (Constant), EMP

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 34.077 | 1 | 34.077 | 61.606 | .000[b] |
| | Residual | 103.990 | 188 | 0.553 | | |
| | Total | 138.067 | 189 | | | |

a. Dependent Variable: RI

b. Predictors: (Constant), EMP

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.083 | 0.284 | | 3.812 | .000 |
| | EMP | 0.670 | 0.085 | 0.497 | 7.849 | .000 |

a. Dependent Variable: RI

Source: results of the author's study

Table 7 presents an overview of the simple regression analysis findings conducted to investigate the influence of EMP on RI, showing that the prediction model was statistically significant (F = 61.606, p-value < 0.01), with (0. .247%) of RI variability (R Square = 0.247) explained by the positive effect of EMP (Beta = 0.497; T= 7.849). Therefore, the positive influence of EMP on RI is expected. Thus, this indicates that H6 is supported. Additionally, simple regression analysis was used to test the H7 hypothesis, which examines CF influence on RI. The findings of the simple regression analysis are shown in Table 8.

**Table 8. Simple regression analysis for the effect of CF on RI**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.666[a] | 0.444 | 0.441 | 0.63901 |

a. Predictors: (Constant), CF

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 61.300 | 1 | 61.300 | 150.122 | .000[b] |
| | Residual | 76.767 | 188 | 0.408 | | |
| | Total | 138.067 | 189 | | | |

a. Dependent Variable: RI
b. Predictors: (Constant), CF

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.627 | 0.221 | | 2.841 | .005 |
| | CF | 0.706 | 0.058 | 0.666 | 12.252 | .000 |

a. Dependent Variable: RI

Source: results of the author's study

Table 8 presents an overview of the simple regression analysis findings conducted to investigate the influence of CF on RI, showing that the prediction model was statistically significant ($F = 150.122$, p-value $< 0.01$), with (0.444%) of RI variability (R Square = 0.444) explained by the positive influence of CF (Beta = 0.666; T = 12.252). Therefore, the positive effect of CF on RI is expected. Consequently, this indicates that H7 is supported. Additionally, regarding the H8 hypothesis, we used multiple regression (stepwise) to test the mediating role of CF in the link between SRS (COM, AP, EMP) and RI. Table 9 presents the results of the analysis.

**Table 9. Findings of multiple regression analysis for the effect of CF**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.666[a] | 0.444 | 0.441 | 0.63901 |
| 2 | 0.712[b] | 0.507 | 0.501 | 0.60352 |

a. Predictors: (Constant), CF
b. Predictors: (Constant), CF, COM

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 61.300 | 1 | 61.300 | 150.122 | .000[b] |
| | Residual | 76.767 | 188 | 0.408 | | |
| | Total | 138.067 | 189 | | | |
| 2 | Regression | 69.955 | 2 | 34.978 | 96.032 | .000[c] |
| | Residual | 68.111 | 187 | 0.364 | | |
| | Total | 138.067 | 189 | | | |

a. Dependent Variable: RI
b. Predictors: (Constant), CF
c. Predictors: (Constant), CF, COM

**Coefficients[a]**

| Model | | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.627 | 0.221 | | 2.841 | .005 |
| | CF | 0.706 | 0.058 | 0.666 | 12.252 | .000 |
| 2 | (Constant) | -.266- | 0.278 | | -.959- | .339 |
| | CF | 0.528 | 0.065 | 0.499 | 8.067 | .000 |
| | COM | 0.498 | 0.102 | 0.301 | 4.875 | .000 |

a. Dependent Variable: RI

**Excluded Variables[a]**

| Model | | Beta In | T | Sig. | Partial Correlation | Collinearity Statistics |
|---|---|---|---|---|---|---|
| | | | | | | Tolerance |
| 1 | EMP | 0.138[b] | 2.010 | 0.046 | 0.145 | 0.619 |
| | COM | 0.301[b] | 4.875 | 0.000 | 0.336 | 0.690 |
| | AP | 0.186[b] | 3.402 | 0.001 | 0.241 | 0.936 |
| 2 | EMP | 0.061[c] | 0.910 | 0.364 | 0.067 | 0.579 |
| | AP | 0.100[c] | 1.751 | 0.082 | 0.127 | 0.794 |

a. Dependent Variable: RI
b. Predictors in the Model: (Constant), CF
c. Predictors in the Model: (Constant), CF, COM

Source: results of the author's study

Table 9 offers an overview of the multiple regression analysis findings (Stepwise) conducted on the role of CF in the link among SRS dimensions (COM, AP, EMP) and RI. As shown in model 2, the prediction model was statistically significant (F= 96.032, p-value < 0.01), with (0.507%) of RI variability (R Square= 0.507%) explained by the positive influence of COM and CF on RI (Beta = CF (0.499), COM (0.301), T = CF (8.067), COM (4.875). As shown in model 2, the AP variable and EMP have been removed from the regression analysis according to the standardised Coefficients (Beta) equal to (0.100, 0.061), meaning the CF mediates the link between COM and RI. Moreover, CF has no role in the relationship between (AP and EMP) and RI, so H8 is supported partially because AP and EMP have been removed from the regression analysis. As shown in Model 1, CF is the most significant predictor of RI variance. CF remained the most influential on the dependent variable according to the standardised Coefficients (Beta) equal to (0.666 and T=12.252). Therefore, (F= 150.122, P-value < 0.01), with (R Square 0.444), indicates that the CF dimension explains 0.444 % of the variance in RI.

## 5. DISCUSSIONS

Due to the expansion of financial services, service failures have become unavoidable. Consequently, these failures often involve mishandled consumer requests, insufficient disclosure of crucial transaction information, technological issues caused by financial professionals, and more (Wang, Hsu and Chih, 2014). Therefore, service managers need to know how to fix these issues and establish efficient recovery methods effectively. However, there is a knowledge gap regarding how banks can implement service recovery strategies and how this impacts customer emotions, forgiveness, and intentions to repurchase. Thus, due to this gap in the existing literature, this study aimed to investigate the effect of (COM, AP, and EMP) as recovery methods on enhancing CF and increasing RI Additionally, the study examined whether CF mediates between SRS and RI.

The author has put forward 8 hypotheses in this research to shed light on the causal connections between our study variables (SRS, CF, and RI). According to the findings, Hypotheses H1 and H2 were corroborated, indicating that emotional recovery strategies (AP) and economic recovery strategies (COM) directly contribute to eliciting forgiveness emotions in consumers. This finding aligns with previous research (Wei, Liu and Keh, 2020). Consequently, in banking, customers often express dissatisfaction by leaving negative feedback or reviews on various platforms. Subsequently, customer service representatives engage with these customers, inquiring about their situation and promptly apologising. Thus, this step represents one of the key hypothesised relationships that can instigate a positive emotional response regarding CF.

Furthermore, the results of this research indicate that EMP plays a crucial role in fostering CF within the context of banking service recovery, thereby supporting Hypothesis 3. Thus, it contends that when consumers exhibit empathy towards the bank involved in the service failure, they are more likely to consider the situation from the bank's perspective. For instance, consumers may understand that service failures are sometimes unavoidable and that any actions the bank takes carry the risk of errors. Consequently, consumers may refrain from placing excessive blame on the bank. Therefore, in the context of banking service recovery, the tendency of consumers to empathise positively influences their ability to forgive the bank.

Furthermore, the study's findings supported hypotheses 4, 5, and 6, indicating a positive connection between (COM, AP, EMP), and RI. According to the Affective Events Theory's theoretical framework, an Event can directly elicit a behavioral or attitudinal response by triggering an underlying mechanism of emotion. In this context, the occurrence of COM, AP and EMP as service recovery strategies employed by the bank leads directly to the attitudinal response of RI. Existing literature also supports the notion that service recovery strategies directly affect customers' recovery outcomes (Li, Ma and Bai, 2020). Similarly, in line with the same findings, COM outcomes were consistent when customers perceived that their loss was adequately addressed and expressed a willingness to make future purchases from the company. Consequently, this suggests that there is a possibility that COM strategies are sometimes designed to incentivise customers to engage in another transaction, such as by offering discounts or coupons, which ultimately enhances their user experience and positively influences their future purchasing decisions.

The findings also confirm that CF significantly and positively impacts RI in banking service recovery, thereby supporting H7. Consequently, the research above indicates that within the banking service recovery framework, when consumers opt to forgive the service failure, it reduces or eliminates their psychological grievances and negative feedback toward the bank. Thus, this, in turn, strengthens consumers' inclination to repurchase. Lastly, the findings confirmed that CF meditates the relationship between COM and RI, so H8 has been supported partially because AP and EMP have been excluded from the regression analysis. Therefore, the theory of affective emotions proposes that individuals experience emotions in response to events, subsequently leading to attitudinal or behavioral responses. It is crucial to consider the mediating role of CF to determine if Spanish bank customers, who may have experienced setbacks previously, are willing to engage with the bank again when the bank takes proactive steps to offer compensation for their losses. Moreover, recognising that these financial service recovery strategies positively impact customers' emotional well-being and their propensity to associate their intentions with the service provider holds significance.

## 6. THEORETICAL AND PRACTICAL IMPLICATIONS

On the theoretical side, this study validates the significant influence of (COM, AP, and EMP) on CF and RI in banking service recovery. As a result, the conclusions above support prior research indicating that consumers driven by emotional and economic factors tend to exhibit positive motivations, such as forgiveness and kindness and repurchase intentions, to facilitate mending a damaged relationship (McCullough *et al.*, 1998). However, there is a scarcity of existing studies focusing on the impact of SRS on CF, specifically in the realm of banking service recovery in Spain. Consequently, this study expands the research perspective on SRS and CF, delving deeper into the relationship between the two and contributing to the theoretical understanding of banking service recovery. Furthermore, this study establishes that within the context of banking service recovery, CF can effectively impact RI, with CF mediating between COM and RI. However, there is a lack of research on the interplay between SRS, CF, and RI, specifically in banking service recovery. Consequently, existing research predominantly relies on studies conducted in other contexts and rarely incorporates COM, AP, and EMP into their research frameworks (Weng *et al.*, 2016; Quan and Li, 2021). Thus, this research demonstrates the novelty of investigating the relationship within the banking service recovery scenario, broadens the scope of research scenarios, and expands the research framework and perspectives.

On the practical side, in the aftermath of a service failure, banks should prioritise creating conditions that foster CF. Therefore, during service recovery, banks should effectively communicate the challenges associated with service work and the inevitability of occasional service failures. For instance, through direct interactions with consumers, they can highlight the complexities of achieving flawless management in customer service within the current banking landscape. Consequently, by drawing comparisons with other banks and industries, banks can elicit consumer empathy towards the demanding nature of banking services and encourage them to view problems from the banks' perspective. Consequently, for impatient consumers, banks should genuinely apologise, provide appropriate compensation, demonstrate respect, offer emotional support, and treat their customers fairly. Therefore, these actions aim to mitigate negative emotions, strengthen the inclination to forgive and increase repurchase intentions.

Additionally, banks should employ various approaches to enhance consumers' willingness to forgive. Therefore, this study reveals that CF is pivotal in fostering RI, mediating between COM and RI. Therefore, following a service failure, banks need to implement targeted service recovery strategies that involve different methods and types of compensation tailored to address the specific service failure. Thus, this approach ensures customer satisfaction and enhances the bank's service recovery capabilities. Moreover, banks should guide consumers towards forgiving service failures by offering appropriate compensation. Furthermore, banks should prioritise resolving customer complaints and anger after a service failure, actively preventing the escalation of negative emotions, and cultivating a greater willingness among customers to forgive.

## 7. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The present study has its limitations, providing valuable avenues for future research. Firstly, regarding sample acquisition, data for this study were obtained through a questionnaire from bank customers primarily located in Alicante City, Spain. However, there was a lack of representation from other cities and regions in Spain. Therefore, future studies should aim to diversify the sample sources and include participants from various cities and regions in Spain. Thus, this would enable researchers to adapt the model to different contexts, such as cultures, nations, and industries, thereby validating and extending the study's findings. It should be noted that the applicability of the results to all sectors may be limited, as complaint issues, solutions, and perceptions of service recovery strategies and customer forgiveness can vary across service types and cultures (Mattila, 2001). Additionally, convenience sampling may impede the generalizability of research outcomes (Malhotra, 2006).

Future studies should also explore the linear and moderating effects of emotional and rational customer commitment on other key constructs, such as justice perceptions, emotions, and other behavioral intentions, to advance our understanding of the service recovery literature. Furthermore, investigating the predicted correlations between e-banking and conventional banking would be valuable, considering the increasing mobile banking usage among different educational and age groups. Lastly, extending this study to the e-commerce industry is recommended, incorporating concepts of loyalty and security. Thus, this would provide insights for online businesses to understand this new customer profile and identify strategies to enhance their loyalty towards online purchases.

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# THE FISCAL DIMENSION OF THE ECONOMIC INTEGRATION

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**Abstract**
*Previously to the "Euro currency's birth" there was even more than a debate about; there was a real fight of ideas between pro- and against the new currency and its "renewed" Union around. Then, there came the moment around the year 2000 (i.e. the Euro currency in 1999, then the effective Euro in 2002) when the pro-Euro and pro-Union won the match – e.g. the "Happy new Euro!" and its fire-works feast – this Programme came to be successful, as previously drawn. The EU was done, as resulted from the Maästricht Treaty (1992); so was the Euro and its Euro-Area/Euro-Zone/Euro-land. This was equally a new step taken into the integration process, as previously indicated by the "old" theory of economic integration. However, on the one hand this was not more than the euphoric end of an old period, on the other just the start of a new one that was going to be quite different and not entirely predictable. So, 2004-2005 was coming to be the moment of the French, Danish and Dutch voters' rejection of the EU Constitution project on the very ground, 2008-2009 was the one of Lehman Brothers' economic crisis, as international, and 2020-2021 the one called "Brexit" – the UK leaving the EU. Along this same period (2000-2023) context, first, singular voices came up in the literature for a presumable "fiscal union to accompany the monetary one", but then such an idea, although not exactly disappeared, stays quite far from the current EU activities and projects. And from the literature, as well.*

**Keywords:** *monetary policy; central banks; fiscal policy; modern monetary theory; economic integration & theory about.*
**JEL Classification:** E02, E52, E58, E62, F15

## 1. INTRODUCTION

This paper belongs to the *synthesis* category of papers and actually is about a theme that the literature proved not quite generous with so far. This is the presumable perspective of the *fiscal union* in the EU States' Organization. Vaknin (2000) - who is not even an economist, but an Israeli psychologist and blogger- looks to have been the one revealing some previous experiences of the monetary unions' side and concluding like: *"...No monetary union lasting without a fiscal* *union backing"*. Or the plot of our below story is rather that, unlike the precedent such unions around in Europe or elsewhere, this EU one is the single and even unprecedented one with several countries sharing a common currency – i.e. it will be about such coupled unions all the more in this case.

## 2. THE FISCAL UNION, AS APPARENTLY

All people, here including those in Europe and in the EU member countries, are supposed to work, the common way of earning life, and pay taxes – it is the same that they will/would be supposed to do in the *fiscal union* circumstances. They pay taxes to: Paris, Berlin, Madrid, Athens, Bucharest and so on. The difference that is supposed to make the fiscal union status is that these taxes paid will belong to the *local category* of taxes – i.e. the other part of taxes, the *central* ones --, will be paid to Brussels – i.e. and these will be not the Brussels-Belgium, but Brussels-the capital of the EU States formation. The taxation responsibilities will shift between EU member States' authorities to the ones of individual citizens and companies, as legal entities. On the contrary, in the current state of the EU taxation is like described in Diagram 1.

**Diagram 1. Taxation in the EU: a synthesis**

| |
|---|
| (1) Taxation belongs to the member States and there is no "European fiscality", except for some terms and rules imposed by the Union to its member-States (see below); |
| (2) As consequently, the EU budget is an additional one to the member-States' individual budgets, as for a 1.2% weight in the cumulated Gross National Incomes of member States* and being formed by direct contributions of the same member-States; |
| (3) The EU's main policies -- as for a Keynesian view: the fiscal-budgetary and monetary ones, respectively –, are working in a complex picture. Only the monetary policy is central, whereas the fiscal policy stays on the member States side and the budgetary policy shares between member States and the EC. |
| (4) A context in which the relationship between the two policy categories is ruled mainly by the Convergence Criteria of the Maastricht Treaty and the Pact of Stability and Growth. |
| (5) A context in which, concomitantly, the EC governing position sees itself weakened enough. |

*Here considering the EU-28 long-term budget of €1,082.5 billion for the period 2014-2020, according to European Union: Integrated Financial Reporting Package Overview, Financial year 2017. 2018.

Source: (European Commission, 2020)

Another aspect to be here noticed is that such a description calls another taxes' classification criterion – i.e. they refer to *direct* taxation, the one that is directly current income related (i.e. of citizens) and/or current revenue related (i.e. of legal entities). The other part of the taxation table belongs to the *indirect* taxes

– i.e. those related to other than the current incomes-revenues and, of course, the fiscal union will be about these either. The well-known *value added tax* belongs here, in its turn (we will develop on in the below 7. paragraph).

## 3. THE TAXATION-BUDGET RELATIONSHIP AND THE CURRENT EU'S BUDGET

Diagram 1 equally regards the other connection of taxation, the one with the afferent administrative *budget* – i.e. the one related to (3) and the following points inside the Diagram. And now it is the moment of equally considering – i.e. besides the fiscal union landscape – the current EU situation, in parallel.

Or, in the EU administrative area the specific taxation does not exist, despite that the EU budget does. And this budget, besides not directly dealing with taxation, has at least three significant characteristics to be here discussed.

**A)** The EU budget deals directly with the Member State's authorities – i.e. instead of dealing with individual citizens and companies, once more – that stay directly responsible in context. Plus, these authorities' responsibility extends for their own national budget up to both keeping limited deficit and related to the EU/EC's budget provisions – i.e. actually, in the EU specific language this means that the Organization's (EC's) central budget is an *additional* one to those of Member States.

**B)** See Diagram 1 again at point (2) for the Member States' contribution to the EU budget as high/low as 1.2% of cumulated member States' Gross National Incomes (GNI). This is usually the result of negotiations between that EU member State and the *EC*, this last in a proper *EU Government* position. Or, the idea is that a very low budget in the Commission's hands says enough about this EU-Government's real significance in question. The EC might be able to manage the Organization's inventory of financing funds aimed to fight specific situations that she couldn't admit, by status, under the threaten of dissolution – i.e. persisting differences in welfare and development between regions that are supposed to be member countries' territories –, despite that individual States could, in similar position and in the same market economy conditions. But what is even more obvious here is what the EC – i.e. the formal EU Government – wouldn't be able to do, as it is: supporting the euro currency or, at least, participating in such a mission. And this is while all ordinary governments currently do. Even more precisely, the EC has nothing to do with the common currency by job description. In context, part of such a responsibility remains on the Euro Member States' side, as will be deepened below.

**C)** Thirdly, there comes the aspect directly confirming/verifying this: the current *EU budget* is banned for any deficit and surplus alternative – i.e., this is for no resulting pressure on the euro currency's value-price. Actually, the EU budget must remain within the limits set out in the Multi-annual Financial

Framework (MFF) and the Own Resource Ceiling (usually seven years). The MFF is the EU's long-term budget to be established for at least five years (European Union, 2016).

**D)** Finally, the fiscal union perspective/ alternative for the EU could solve these current problems of its budget by here remaking the ordinary State's administrative structure. However, the more the *budget of the fiscal union* will do, as compared to the present day one, the more it will stay active and never ignore, neglect, or just relax on the current Organization's preoccupation for fighting development and welfare intra-area disparities.

## 4. THE BUDGETARY-MONETARY POLICIES' RELATIONSHIP. THE STATES' HISTORICAL EXPERIENCE

The State is supposed to miss all proper interests against its citizens (Madison, 1787) - but this is more than an aspiration; this is reality. The presumable State's interest comes up *vis-à-vis* the same State's equals, i.e. other States. Not even the examples of corrupted States and dictatorships contradict this assertion - i.e. the State serves the others' interests anyway, here including those in its power and the dictator's freedom in acting (Andrei, 2019, pp. 351-355).

Or, such an assertion might be extended at least on two floor levels: (i) for the same State that makes economy and/or becomes an *economic entity* and acts as such; (ii) and so, for companies joining the citizens' position vis-à-vis the State. In other words, the State might be assumed to do in its economy making the same as in all its other statutory positions. And this is exactly what makes the State act economically differently than individuals and firms – i.e. the other economic entities in the same area. This activity moves between collecting revenue – i.e. through taxation -- previously to spending for its specific working, and usually rejecting profits and budget surplus, as non-specific to its acting.

And it is so that *taxation* – i.e. the *fiscal* function – comes back to the State's priorities. It is concomitant with the budget foundation, while money might here come later on or even not – i.e. *taxation* is a topic that appears unique by not too much changing its principles and acting since the antique era, when currencies issued by States might even be missing, e.g. in the ancient Egypt. The old "*Principles of Taxation*" of Adam Smith (1776), in his first treaty of economics ever, are still found applicable. When and where currencies were born and issued, in the antique era – e.g. in the Persian Empire, the Greek City-States, the Roman Empire – this was as the basic accounting facility for the State's both revenues and spending. Even much later on, in the modern and contemporary eras – e.g. in which money and credit have become inseparable, despite their also initial separation in the antique era – taxation stays prior to the money proper State's management.

In exchange, the contemporary era – i.e. more exactly, immediately after World War two – brings in a new money management formula: the *central bank*, versus commercial banks, as for the *banking system,* nearly all over the world (Patat, 1991), here including in a certain measure the communist part of the world at that time. A non-liberal (i.e. no private capital for the central bank anywhere/ibidem), but efficiency proved maneuver – i.e. management and political decision made – assigns the central bank for the *monetary policy* and so for working about on equal foot with the Government – i.e. the monetary policy also becoming the lonely national level policy that the same Government conveys to somebody else, who isn't a subordinate agency or something; and this despite also unprecedented difficulties implied by this to both institutions. Then, this is exactly the context in which the new *euro* currency was coming to be born in 1999 – i.e. be it as an unprecedented currency common to several States in a new Organization and paradigm.

## 5. THE EU INTEGRATION PROCESS WITH NO CENTRAL BUDGETARY- MONETARY POLICIES' RELATIONSHIP JUST YET

Or, the problem for the EU isn't exactly the fact that the *euro currency* was born under the auspices of the *European Central Bank (ECB)* – all the less for the common currency new option, instead of its precedent EMS kept in force – but just that it is the ECB's Government counterpart here missing, unless through contradicting the "old" Organization's status entitling the European Commission (EC) as such. The European Monetary System (EMS/1979-1999) is seen too similar to the Bretton Woods international monetary system (IMS) structure for being suitable to the EU by McKinnon (1992).

Here recall from above (3.) the competence limits of the European Commission (EC) which prevent it from being the ECB's collaborator in the matter of the euro currency. The reality is both that the EC is missing from the "*euro-mission*" – i.e. together with its EU budget -- and that the European Central Bank (ECB) here finds somebody else to deal with in such a respect.

But such anomaly apparently results directly from the basic *theory of integration* (Balassa, 1962), unless for a monetary union supposed to stay in the European Monetary System (EMS/1979-1999) stage. We dare to call it ¨*Balassa-5¨, as the five-stage foreseeing model* for a full integration process, as imagined as: [1] free-trade area, [2] customs union, [3] common market, [4] economic union, [5] economic & monetary union. Apart from referring to previous works in economics that belong to J. E. Meade (1955), Jacob Viner (1950) and even to Alfred Marshall (1956), the author does here analyse what he here calls ¨*projects of integration*¨ at least in Europe (the Economic Community, that was the name of the today European Union at that time, and European Free Trade Area) and in Latin America (the Central American Common Market and the Free Trade Area of the South America), but only the EU perceive without interruption these written lines as a kind of ¨*programmatic document*¨ – e.g. CVCE, European NAvigator

(2016); European Parliament (1986) and Treaty of Maastricht (1992). Plus, to be here mentioned that national currencies in place, as a money plurality for the EMS, would apparently not need the central bank, as specific to just one currency to be managed.

And two aspects came to be unanimously considered so far: (i) just the Euro-zone, as the ¨economic and monetary union¨ of Balassa (1962); (ii) despite its model accomplished, *¨Balassa-5¨* did not bring the real/full integration – i.e. not even in the limited Euro-Zone – in and the fiscal union does not fit into this model, either. Then, in its new *updated/adapted* form (Andrei, 2014) that the theory of integration meets the difference between "*man pushing events*" – for the *incipient* integration of free trade area and customs union – and the opposite "*events pushing...*" – for the *advanced* integration of the common-unique market, economic and monetary unions, here including the euro-common currency and clearing the way for further presumable integration exigencies – and this seems to be essential for reconsidering the fiscal union condition, as also presumable – i.e. actually, for correcting the work anomaly shown here, above.

Andrei (2014) is for free trade area, customs union and common market reconsidered; just two stages – i.e. incipient & advanced integration –, instead of the previously considered five, then criticized in the literature (Tsoukalis, 2000) and convergence and optimum currency area (Mundell, 1962; Mundell, 1973), as coordinates for the last/ advanced integration great stage. Arguments in favour of this renewed form (except for criticism collected on the *"Balassa-5"* side): (I) just the EU on both the *incipient* and *advanced* integration stages done; the other State formations just for the incipient integration done (II) in the incipient integration circumstances there might be easy for new member States added and conversely, corresponding ruptures. As compared to such multiple structural changes of integration in Central America, but even in Europe(in the European Free Trade Area case), following the requirements of national interests, "Brexit", the leaving of the EU by Great Britain, was a kind of "painful amputation" for both sides; (III) directly on the ground, the criterion of distinction between incipient and advanced integration parts/stages is the one making "man pushing events" for the previous and "events pushing…" for the latter.

For the full picture of the current EU, in its budgetary-monetary policies' junction dimension, the *maximum 3% of GDP budget deficit for a presumably stable (euro) currency* requirement looks to be accomplished/ensured at present since considering the whole / large EU's budget as formed by the EC's central one and the member States' ones together – i.e. here considering the Euro-Zone member States and candidate States. However, this is just theory, as vis-à-vis the permanence of such a requirement in concrete year-by-year economic conditions (e.g. the recent 2008-2009 crisis, when hearing not the specific EU's voices, but the ones of German and French officials, like before the War) and correspondingly weak rule of the "Pact of Stability and Growth" facing the Euro-Zone member States.

## 6. THE EU: PRESENT AND PERSPECTIVES OF THE EURO COMMON CURRENCY

The true problem actually comes even before this above "equation" ensured – i.e. it is about the question asked: "*to whom does the euro-common currency belong?*" with its alternative answer that is, of course, the EU, versus the member States of the Euro-Zone. Or the previous EU alternative is entirely the one of the EC, as discussed above.

Instead, the alternative of the Euro-Zone *member States owning the Euro-currency* is a really interesting one. On the one hand, the ECB currently works with these States for the Euro-currency management, but in too difficult work and rule specific circumstances to be expected to go on. On the other, when here imagining such a problem solved – e.g. by an imaginary professional prolongation of the European Council's acting into the monetary topic and management activity -- a new and even deeper problem will here arise: how about the Union, with its spirit and unity of decision built and in its given advanced integration stage, while it is still the member States who decide instead? And these States even belong to just a part of the Union area. Unfortunately, no theory of integration for this new issue, either.

Or just here remember the Euro's birth in the 1999-2002 interval – it was so smooth, happy and honourable for those who proven able to make it – i.e. here including for the previous end of the EMS that was by far not similar to the ones of its previous IMS of Gold Standard (1931-33) and Bretton-Woods international agreement (1971). It is true that the Euro's survival now, two decades after that happy event, sounds different. But equally do not omit that the same euro's making has taken a little longer than that moment around the year 2000 – i.e. during the period since 1971 with actions and measures taken by the European Community further on, all of these also proving the Organization's ability to conduct such a long-term project.

Shortly, the perspectives of the Euro currency here in debate are just two. The one is its ceasing existence – i.e. with harsh consequences for the integration process managed so far and step back into at least before the year 2000 time. The other might be clearing the way for the presumable *fiscal union* – i.e. here also in debate and with other complex consequences to be developed in the next and final 7. – and continuing from what the theory of accounting calls the *break-even point* and that the EU already over-passed in its integration project. We here refer to the historical moment of distinguishing between what were called above the incipient and the advanced integration stages – and in our view that might have been the moment of deciding on the EMS founding (1979). Note from above also that the

EU is the single/unique integration project so far preferring the full variant of economic integration viewed by Balassa (1962).

## 7. CONCLUSIONS FOR THE EU: SOME MODERATE OPTIMISM. THE FISCAL UNION APPROACH IS POSSIBLE, AND IT MIGHT BE ALREADY STARTED

Continuing from above, the *fiscal union comes in favour of the economic and monetary union* – i.e. in favour of the economic integration process in its advanced stage – and implicitly in favour of the *Euro,* as both currency and previous long-term enterprise. The Vaknin (2000)'s assertion appears as justified, in context, while the Krugman (1993)'s reference looks symbolic for this topic's unpopularity even in just theoretical terms. Diagram 2 lists some factual and mental factors opposed to the fiscal union alternative future – i.e. actually, this paper of ours isn't for inventorying or examining the pro- and/or anti-fiscal union positions in the EU. Plus, not at all interested in the political thinking we prefer to appreciate, for the theorists opposed to fiscal union (not for politicians), a certain reservation to the idea that the federal State might be the restricted future, unique and this-way mandatory alternative for the EU Organization.

So, staying on the theory of integration's side and in consistency with our (above) text so far, let us have at least two points optimistically related to the fiscal union alternative of future. First, *fiscal union* appears feasible in the EU now, in the 21st Century, the same as the *monetary union* during the last half of the previous 20th Century, here including as multi-decade implementing/development. The Union proved experienced already in this kind of projects managed.

Second, see the example of European Union's common system of value added tax -VAT- (EU-Council Directive 2006/112/EC) with its subsequent additions and correction up to the current post-pandemic time. This Act is aimed to adjust the current VAT legislation in the EU-multi-country area, naturally, in the sense of fighting the harmful phenomenon called "fiscal competition" (among member States) in the unique/common market. As in its primary details this Directive provides a 5-15% application of VAT rates to a list of goods-products traded. Or let us here see a correspondence of this rule, in its current time, with those "Smithsonian" and "Basel" Agreements in 1971-72, as the primary steps taken by the "Monetary Snake/in the Tunnel" for the monetary union which was gone effective three decades later (European Parliament, 2015) - i.e. despite the so important differences between these events.

**Diagram 2. A brief inventory of factual and mental obstacles to the presumable EU fiscal union**

| |
|---|
| (1) the adverse effects of the EU extension. |
| (2) the same for a presumable *federalization* – meaning centralism strengthened and separatism fuelled, here included anti-European policies run by member States and political movements developed around. |
| (3) the same for a presumable *"communitarisation"* of the member States' accumulated debts – i.e. EU, as a "union of debts" (Duff,2021) |
| (4) influent politicians inside their own nations fearing their presumable "provincial" (new) status and afferent frustrations. |
| (5) the gap viewed between the "center" and "periphery" of the Union, as for different levels of welfare. |
| (6) beyond "Brexit"(UK and so much reticence in Denmark, Sweden, and, more recently, even in France and Ireland, against the EU extension initiative), any further (real and/or imaginable) "leaving the Union" event, as the beginning of a large and destructive rupture; |
| (7) keeping in mind the McKinnon(1992)'s theory of: *the nominal anchor in bankruptcy* — the Euro keeps its *larger area* around the so called "*Euro Area*" or "*Euroland*". |

Source: (Duff, 2021)

This double exemplification – i.e. from the monetary and fiscal unions (to be) implemented – might be able to complete the above general comparison between these real and possible EU projects, at least in the sense that the above EC's Directive on VAT might stay debatable for being, or not part of a really existent/ future fiscal union in the EU. So were the "Smithsonian" & "Basel" Agreements, at their time, for the later monetary union in place.

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# DO EUROPEAN GREEN BONDS IMPACT FINANCIAL STABILITY?

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**Abstract**
*In the context of migration from a brown to a green economy in connection with global events, the way that transition to a green economy can impact the financial systems is a topic of interest and also Green Bonds are one of the main tools to fund that transition. In this article, I aim to study the relationship between European Green Bonds and Financial Stability. The goal of the research is to explore and explain the implication of the European Green Bonds in financial stability. To examine the financial stability, I use three systemic risk measures: CoVaR & Delta CoVaR (Conditional Value at Risk) and MES (Marginal Expected Shortfall). To allow to quantify the Green Bonds, I create a Green Bonds Index, which contains 13 most important Green Bonds indices for the European market. The data used to quantify the systemic risk is the mean of the processed returns of the banking sector (38 companies) listed on STOXX600. The study employed data starting from April 2017 until April 2022, a period with important global events: the implementation of the Paris Agreement began in 2015, the Covid-19 Pandemic at the beginning of 2020, the European Green Deal which was signed in 2020 and begging of the Ukrainian – Russian War on February 24th 2022. To examine, in a richer way the relation between variables, I use Quantile Regression. I estimate the quantile regression model for many quantiles between 0.05 and 0.95 and compare the best-fit line from each of these models. Also, I use lead-lag effects to o arrange if the effects of the modification of the Green Bonds Index can affect the financial stability. I also measure the quantile dependence between variables, using the Cross-Quantilogram model.*

**Keywords:** *green bonds; financial stability; systemic risk; quantile regression; cross-quantilogram.*
**JEL Classification:** C5, G0, G1, Q5

## 1. INTRODUCTION

Climate change is a real challenge for society and the financial systems. The importance of a well-designed plan and the measures that society adopts is the only way to reduce carbon dioxide emissions.

In the last years, the focus of society on the environment and the effects of climate change was a priority for the European Union especially. Also, the context for this study, with legislative changes in CO2 reduction, the Covid-19 pandemic and the crisis as a result of the war Russian – Ukrainian war, affects stability and generates problems in the stock market.

The growth of the Green Bonds market has been hailed as a critical component of the transition to a more sustainable global economy. While Green Bonds offer a promising opportunity for investors to finance environmentally beneficial projects, concerns have been raised about their potential impact on financial stability. Specifically, there are concerns that the rapid growth of the green bond market may lead to market distortions, misallocation of resources, and increased systemic risk. The purpose of the present paper is to critically examine the potential impact of green bonds on financial stability, drawing on existing literature and empirical evidence. Also, the research will try to measure and establish which systemic risk measure has the most significant relationship with the European Green Bonds.

## 2. LITERATURE REVIEW

Lavrinenko *et al.* (2019) provide an evaluation of the status of sustainable development across European Union members. A key focus of the analysis is to assess the relevance of the green economy factor in achieving sustainable development objectives within the European Union. Furthermore, Lavrinenko *et al.* (2019) propose a new paradigm that challenges the notion of environment and economic growth as incompatible goals. Through an analytical approach that considers the interplay between economic and environmental factors, the author aims to advance a more integrated understanding of sustainable development, which acknowledges the importance of balancing economic growth with environmental protection. The work of Bolton and Kacperczyk (2021) involves a cross-sectional examination of green and brown assets, with a focus on identifying any discrepancies in the pricing of carbon risk within financial markets. The authors contend that the current pricing of carbon risk is inefficient and fails to adequately account for the true risks associated with carbon emissions.

Monnin (2018) found that the financial risk generated by the issuance of instruments such as green bonds represents an economic aspect that must be taken seriously. A macroprudential approach to establishing clear criteria for accessing this type of instrument is paramount.

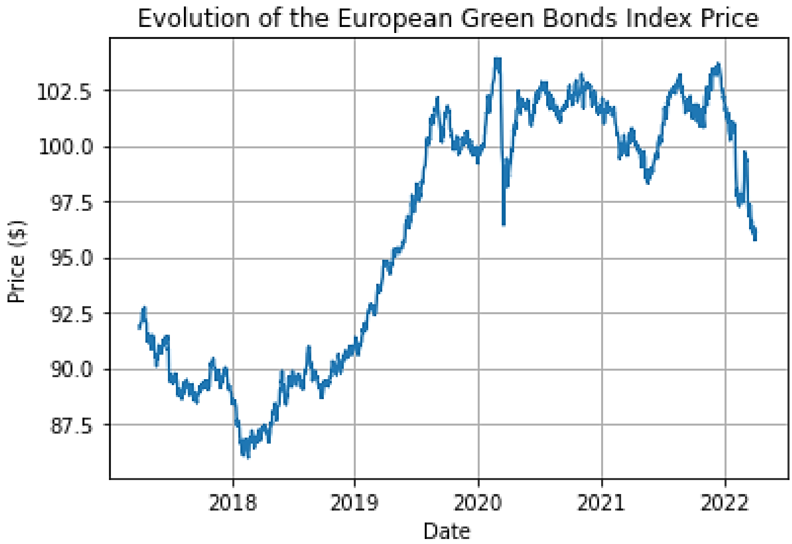
The measurement of systemic risk was identified by Harun and Gunadi (2022) as the core of financial stability and macroprudential policy. In their paper, they developed an overview of the financial system with a good approach of systemic risk.

## 3. METHODOLOGY

The article methodology relies on two main datasets. For the quantitative analyses, I will employ as an independent variable the daily logarithmic returns for 13 European Green Bonds Idexes and, as dependent variables, I will use the

European Banking sector – 38 banks from STOXX600. All the data were obtained from the Bloomberg Terminal database. The whole study will be processed using Python. All the above variables cover the interval between 15th April 2017 – 15th April 2022 and focus on the relation between European Green Bonds and Financial Stability – represented by the selected Systemic Risk measures.

After collecting the data, I will pre-process it: find the missing values, replace the NaNs values with the value from the next row using "bfill" method and create an Index with the mean of the previous European Green Bonds Indexes. In Figure 1 is represented graphically the evolution of the European Green Bonds Index from April 2017 to April 2022. Next, I will calculate the daily logarithmic returns of the Index.




Source: author's own research results – extracted from Bloomberg Terminal

**Figure 1. Evolution of the European Green Bonds Index Price**

Also, to calculate the selected systemic risk measures (CoVaR, Delta CoVaR and MES), I will create a Stability Index using the previous methodology. In Figure 2 is represented graphically the evolution of the European Banks listed in STOXX600. Using the previous methodology, I will calculate the dependent variables for the quantitative analysis.


Source: author's own research results – extracted from Bloomberg Terminal

**Figure 2. Evolution of the European Banks Index Price**

Adrian and Brunnermeier (2009) propose a methodology for quantifying systemic risk. Also, they construct two countercyclical measures which help to predict future systemic risk. CoVaR (Conditional Value-at-Risk) measure has the ability to identify risks to the stability of the financial system. These risks are generated by the selected banking sector and can cause imbalances in the financial system. CoVaR is not dependent on the price level of the selected assets. Also, it measures the contribution that certain assets have in anticipating systemic risk. Delta CoVaR measure represents the difference between the CoVaR during the period when a banking institution is unstable and the CoVaR for the less volatile periods with reduced systemic risk.

Acharya *et al.*, (2010) present their contribution to systemic risk measures and show how each financial institution contributes to systemic risk by creating the Marginal Expected Shortfall – MES measure. MES is a simple way to calculate the losses that a bank can record. MES is calculated as the average return of an asset for the most non-performing 5% days of the period covered. This measure shows the contribution of that asset to the generation of a financial crisis.

In Table 1 is presented the statistical properties of logharitmical returns and information about the sample size for each selected variable used in the study.

**Table 1. Descriptive statistics of the selected variables**

| | logRets_Green | logRets_Stab | CoVaR | Delta_CoVaR | MES |
|---|---|---|---|---|---|
| count | 1277.000000 | 1277.000000 | 1277.000000 | 1277.000000 | 1277.000000 |
| mean | 0.000028 | -0.000068 | 0.023167 | 0.010203 | 0.024466 |
| std | 0.002819 | 0.014568 | 0.003491 | 0.003476 | 0.010313 |
| min | -0.019232 | -0.125841 | 0.019871 | 0.006938 | 0.012056 |
| 25% | -0.001627 | -0.006683 | 0.021245 | 0.008303 | 0.018663 |
| 50% | 0.000101 | 0.000317 | 0.022117 | 0.009145 | 0.021568 |
| 75% | 0.001643 | 0.006375 | 0.023709 | 0.010692 | 0.026047 |
| max | 0.013664 | 0.093658 | 0.043987 | 0.031042 | 0.093565 |

Source: author’s own research results – extracted from Bloomberg Terminal

A Quantile is a cut point, that splits a probability distribution into continuous intervals with equal probabilities. In most statistics analysis, the Quantile Regression is used as an elaboration of the linear regression model and associated estimation method of last squares. Mosteller and Tukey (1977) used Quantile Regression to explain in a richer way the relationship between independent and dependent variables that are distant from the mean. Koenker and Bassett (1978) developed a Quantile Regression methodology which aims to extend the ideas to the estimation of conditional quantile functions, models in which quantiles of the conditional distribution of the response variable are expressed as functions of observed covariants. Anywise, Koenker and Hallock (2001) develop an exhaustive overview of quantile regression and how the model works in different situations. Thus, a good explanation of the variables and results are presented in their paper.

The structure of the quantile regression model equation for the π (quantile regression formula is presented below).

$$Q_\tau(y_i) = \beta_0(\tau) + \beta_1(\tau)x_{i1} + \cdots + \beta_p(\tau)x_{ip} \quad i = 1, \dots, n \tag{1}$$

For the next part of the quantitative analysis, the cross-quantile dependence between the returns of the European Green Bonds Index and Financial Stability (Systemic Risk measures) returns will be examined to determine how the strength and duration of the spreads between the indices will change under the up and down market movements. Cross-correlation is one of the most frequently used methods to estimate the correlation between variables in time series. Han *et al.* (2016) introduced cross-quantilogram, a powerful methodology that measures and investigates the quantile dependence between two-time series. The structure of the cross-quantilogram model equation is presented below.

$$\rho_\alpha(k) = \frac{\mathbf{E}[\psi_{\alpha_1}(x_{1,t} - q_1(\alpha_1))\psi_{\alpha_2}(x_{2,t-k} - q_2(\alpha_2))]}{\sqrt{\psi^2_{\alpha_1}(x_{1,t} - q_1(\alpha_1))}\sqrt{\psi^2_{\alpha_2}(x_{2,t-k} - q_2(\alpha_2))}} \qquad (2)$$

To construct the network, we use the algorithm outlined in Han *et al.* (2016), following which the Cross Quantilogram is calculated directly based on quantile hit functions instead of OLS quantile regressions. These latter may be used to define a conditional probability distribution for the pair of stationary time series to be analysed. In the present case, the focus is on the primary unconditional case. For one time series at time t, the quantile hits are evaluated against the lags of the other time series. This procedure allows for the identification of directional dependence at various quantile levels in the return distribution. I consider 15 lags to evaluate the quantile dependence.

Following Jiang *et al.* (2016), I apply the methodology and explore the cross-quantilogram heatmaps for the 13 days lag. In summary, a cross-quantilogram heatmap provides a visual representation of the dependence structure between two-time series, and you can use it to identify patterns, trends and asymmetries in the joint distribution. While Baumöhl *et al.* (2017) focused on the dependence of gold from different stocks price variations, we will consider the relationship between European Green Bonds and Financial Stability.

## 4. RESULTS

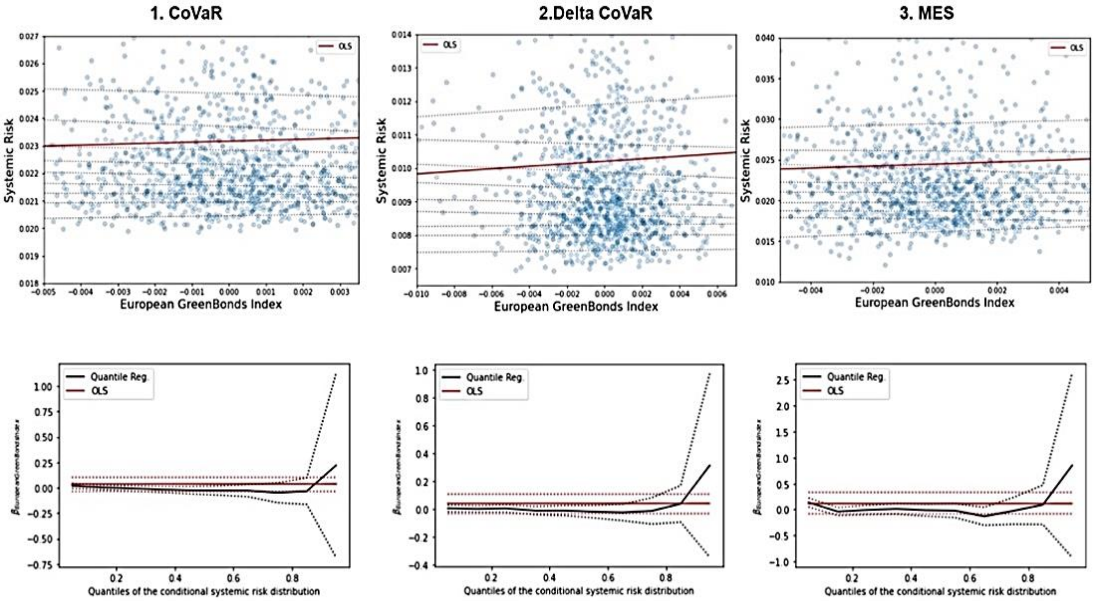
In total, there are 1277 observations used in all regression, for the period mentioned in the previous part (15th April 2017 – 15th April 2022). The main interesting observation for the Quantile Regression in comparison with the Ordinary Least Squares regressions is that the result improved, the R-squared is still at a very low level, the relationship between the evolution of the European Green Bonds Index and measures of the systemic risk (CoVaR, Delta CoVaR and MES) cannot be explained.

The model estimates the quantile regression model for 10 quantiles between 0.05 and 0.95 and compares the best-fit line from each of these models to Ordinary Least Squares results. The bandwidth value varies from 0.000825 and 0.002408. However, a very small bandwidth may result in overfitting, causing the estimated quantile to be too sensitive to individual data points.

Also, a sparsity value between 0.00412 and 0.01264 indicates a relatively small proportion of the coefficients are non-zero and most of the modification of the European Green Bonds Index prices has little or no effect on the quantile being estimated. This sparsity can be interpreted as a form of the European Green Bonds

Index, where the regression model is effectively ignoring many of the predictor variables that are not relevant for predicting the conditional quantile. It is important to note that sparsity does not necessarily imply that the selected variables are the most important predictors of the quantile. It may also be useful to consider additional data sources or imputation methods to fill in the missing values and improve the accuracy of the present model.

In Figure 3 it can be seen on the first row the comparison between the best-fit lines for 10 quantile regression models to the least squares fit and on the second row the figures for the quantile regression analysis for each systemic risk measure. The dispersion of all systemic risk measures returns (CoVaR, Delta CoVaR and MES) remains constant with the European Green Bonds Index returns variation.

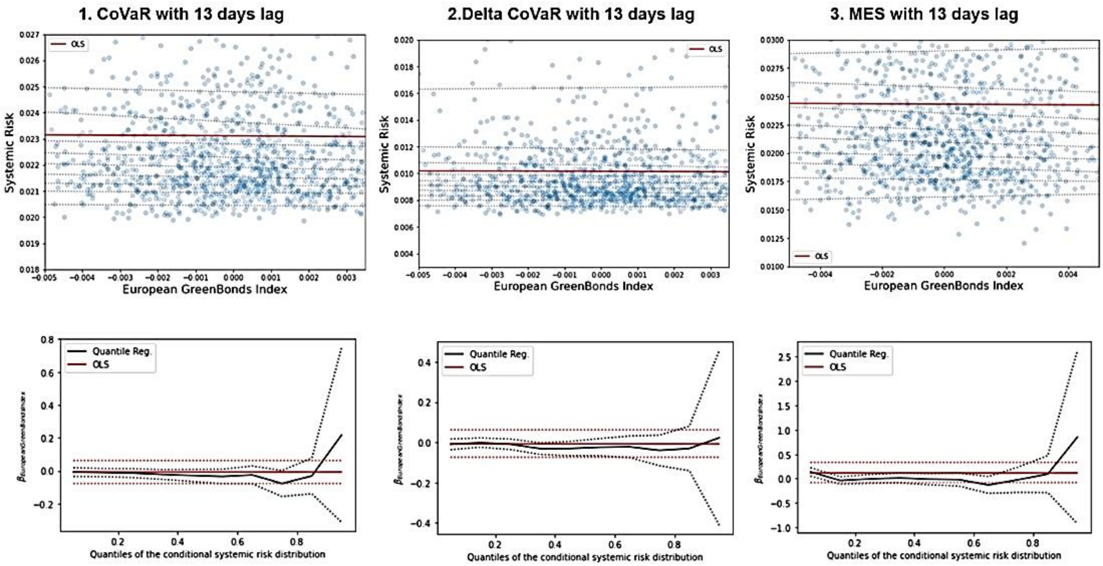



Source: author's own research results – extracted from Bloomberg Terminal

**Figure 3. Quantile Regression results without lag**

On the second row, it can be seen the dotted black lines from a 95% point-wise confidence band around 10 quantile regression estimates (solid black line). The red ones represent Ordinary Least Squares regression results along with their 95% confidence interval. The paper also notes that the quantile regression point estimates lie outside the OLS confidence interval, which suggests that the effect of the Systemic risk on the European Green Bonds Index price may not be constant across the distribution.

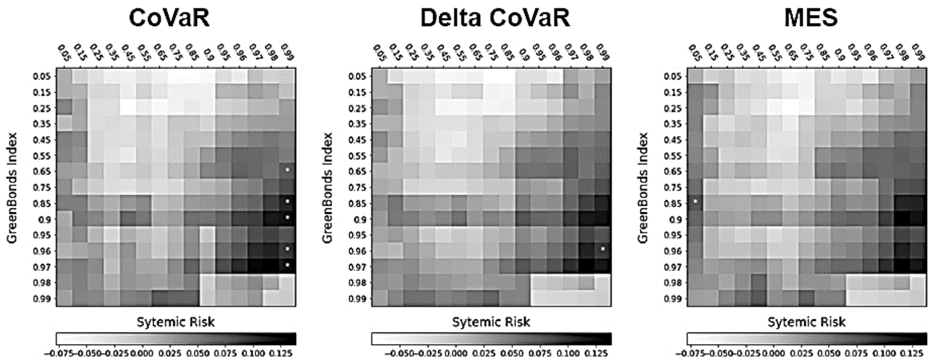
After running multiple Quantile Regressions with multiple lags, it can be seen a significant improvement by using the 13 days lag for the European Green Bonds Index. The consequences of the systemic risk variation can be better observed 13 days after the European Green Bonds Index price variation. Figure 4 shows the improvement for all three systemic risk measures. As can be noticed in the figures, slight modification in the relationship between European Green Bonds and Financial Stability.




Source: author's own research results – extracted from Bloomberg Terminal

**Figure 4. Quantile Regression results with 13 days lag**

The next step of the present paper is to check for the quantile causality of the influence of the European Green Bonds Index on Financial Stability. Figure 5 presents the heatmap results for the cross-quantile at quantiles mention in the methodology part with 13 days lag. From left to right, CoVaR – European Green Bonds Index heatmap, Delta CoVaR – European Green Bonds Index heatmap and MES - European Green Bonds Index heatmap, with x-axis corresponding to a quantile of the measure of systemic risk and y-axis to a quantile of the European Green Bonds Index. In the case of all the sets, the heatmap shows the cross-quantilogram at the following quantiles: {0.05, 0.15, 0.25, 0.35, 0.45, 0.55, 0.65, 0.75, 0.85, 0.9, 0.95, 0.96, 0.97, 0.98, 0.99} for both variables with a 13 days lag. The reason for choosing the highest quantiles was determined by the improving results shown in the first tests.




Source: author's own research results – extracted from Bloomberg Terminal

**Figure 5. Heatmap results for the Cross-Quantilogram**

For CoVaR, the most significant scenario for the cross-quantilogram was marked with a star. The strongest association between the European Green Bonds Index logarithmic returns and CoVaR is present in the 0.99 quantile. In the next heatmap, with the dependent variable the Delta CoVaR the shape looks similar to the previous one, the significant relationship is also at the 0.99 quantile. The last heatmap shows the highest dependence between variables at the 0.05 quantile of the Marginal Expected Shortfall. One plot is capable of simultaneously capturing 256 measures of dependence across the whole range of quantiles of the bi-variate distribution of returns as well as the magnitude of the dependency measures.

## 5. CONCLUSIONS

The recent events in the field of climate change, corroborate with the global events, determined to study the dependence between the Green Bonds movement and Financial Stability.

For the present analysis, I selected 13 European Green Bonds Idexes and the European Banking sector – 38 banks from STOXX600. The quantitative analysis was focused on a period spanning from 15$^{th}$ April 2017 to 15$^{th}$ April 2022. First, I created a European Green Bonds Index with the mean of the previously selected bonds. After, I created a Banking Index, which I used to calculate, with the mentioned methodology, CoVaR, Delta CoVaR and MES. Using Quantile Regression (Koenker and Hallock, 2001) and Cross-Quantilogram (Han *et al.*, 2016) methodologies, I studied the hypothesis of the study. Also, for a better understanding, I tried to study the dependence between variables with lags from 1 to 15 days. Finally, I used the 13 days lag with dependent variable the logarithmic returns of the European Green Bonds Index and as independent variables the systemic risk measures (CoVaR, Delta CoVaR and MES).

The findings of the present paper highlights the non-linear relationship constant across the entire distribution between the evolution of the European Green Bonds and the Financial Stability. This result suggests the importance of using a quantile regression approach, as it provides a more nuanced and detailed understanding of the relationship between the European Green Bonds and the Systemic Risk measures. Also, after the analysis, we underline that the best measure of Financial Stability in explication of the European Green Bonds movement is CoVaR. The strongest relation between European Green Bonds and Financial Stability is with a 13 days lag.

The main contribution of the analysis is rooted in quantifying the financial stability and the dependence between the European Green Bonds with the Systemic Risk. One of the impediments for current research was the period full of events that disrupted financial stability.

In future studies, could be used different methods for quantifying financial stability, also it could be collected a large database using more Green Bonds Indexes.

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# BANKING PHISHING – PROPOSED SOLUTIONS IN ORDER TO REDUCE THE NUMBER OF CYBER ATTACKS VICTIMS


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**Abstract**

*The financial sector is one of the main targets of cybercriminals, who often use phishing attacks to avoid banks' security protocols in order to attract victims and convince them of the legitimacy of their actions. They use various social engineering tricks by creating some scenarios (like fake account updates, security upgrades, etc.) and specific techniques (like imitation of images, logos and the identity of banking institutions, etc.). This article aims to identify and evaluate these actions, then review existing techniques. Because phishing susceptibility depends on user's awareness, cyber criminals often exploit human nature* *instead of using sophisticated technologies. As a result, even if security protocols are embedded in banking sites and applications, the human element often fails to detect these fraud without the basic knowledge of digital ethics that would have made them more aware of potential risks so that intruders would not he steals their money and sensitive personal data. This article contains information quite close to the technical area and also relevant explanations on possible ways to reduce the victims of attacks number.*

**Keywords:** *cybercrime; impact; crisis; awareness; prevention; cybernetics analysis; incident response.*
**JEL Classification:** D83, K22, I21

## 1. INTRODUCTION

Since the significant expansion of cyberspace, the online users are increasingly sharing their personal information and, as a result, an enormous amount of data related to identification or financial transactions is exposed to cyber-criminals. Phishing is one of the examples of crime by which criminals deceive their victims, in order to later exploit the exfiltrated elements. From the first attack reported in 1990 the method has evolved, as well as the delivery vectors which becoming particularly sophisticated.

This article provides a brief overview of cyber security in the banking sector through phishing, as well as its impact on bank users, regardless of the geographical area we want to refer to. Because the competent authorities have been informed that the main methods of fraud are phishing and vishing, we want to support them in finalizing the measures already implemented by most of the banks by adding concrete examples and proposals to counter these types of attacks.

The purpose of this article is also to raise the awareness of the employees of financial-banking companies and users of online banking, by presenting recommendations on the risks they face when responding to the phishing messages, as well as, improving the security of systems which they are using in their bank commercial relations. Last but not least, we want to make easier for the average user to understand the criminal phenomenon, the gravity and the ever-increasing complexity of the cybercrime.

We want to draw everyone's attention to the criminal activity in the web area, trying to support the education of providers of products, services and end-users about accessing and operating the Internet safely. Online security and privacy, adjusting the legislative framework and enforcing sanctions as a mechanism to block cyber attackers, are just normal measures which must be implemented as soon as possible globally.

Therefore, at the end of the article, the authors point out that while cybercrime can never be eradicated, phishing awareness campaigns could be a natural way to avoid losses and reduce the impact of a successful attack. If against cybercriminals will not be applied legal measures for their actions, this will lead to discouragement and failure in creating a way to stop, or reduce this phenomenon.

In the Literature Review chapter, the authors mention some of the recent materials developed by companies and organizations specialized in monitoring, preventing and combating cybercrime, in relation to the general trends of escalation and intensification of attacks. The Methodology chapter presents the approach to this subject in the context in which the technical team has over ten years of experience in behavioral monitoring of cybercriminals and the techniques developed by them. The next chapter sets out the stages of a phishing attack, so that the recommendations to be exposed in the Proposals chapter.

The whole article is intended to be seen as a small guide for banks, institutions, private companies and for individuals, in the sense of warning and warning about the dangers to which they may be exposed and how to avoid them. Awareness-raising efforts must be complemented by procedures for the implementation of prevention and protection measures. We can say without doubt that there are no universal solutions and that the most exposed element in the entire operational chain is man.

## 2. LITERATURE REVIEW

Unfortunately, the literature has become quite rich in information lately. We present some of these in the following.

According to PwC's Global Economic Crime Survey, 46% of the organizations surveyed reported having faced fraud, corruption or other economic crimes in the last 24 months. (PwC, 2020)

The survey of 1,296 executives in 53 countries and regions found a growing threat from cybercriminals whose methods of deception are constantly evolving in effectiveness. Nearly 70% of fraudulent organizations reported that the most disruptive incident was an external attack. ESET research in 2021 "found a 7.3% increase in email attacks between May and August 2021, most of which were part of phishing campaigns." (ESET, 2021)

IBM's 2021 research also confirmed this trend, citing a 2-percentage point increase in phishing attacks between 2019 and 2020, partly due to COVID-19 and supply chain uncertainty (IBM, 2022). The CISCO report on trends in cyber security threats in 2021 suggests that at least one person has accessed a phishing link in about 86% of organizations. Company information indicates that phishing is found in about 90% of data breaches. (CISCO, 2022)

Symantec's (2020) research indicates that during 2020, the ratio of 1 in 4,200 as the number of phishing emails. In the case of targeted attacks, 65% represent spear phishing as the main activity of organized groups and vector of infection.

Users, although they must be prepared to face the attack, should not be the last line of defense. To achieve this goal, investments in technology must be increased to prevent phishing attacks. The increasing frequency of attacks from year to year clearly indicates that spam filters, antivirus software and other security solutions need to be complemented by alternative technologies.

We have carefully studied what has been published so far and we have identified exactly the area not covered so far by the specialized literature, namely the one related to the unambiguous relationship between financial and banking institution, versus client. Exposure to attacks can be unilateral or bilateral, with contagiousness elements that can lead to chain reactions and financial losses, image damage, etc.

## 3. METHODOLOGY

We have built the structure of this document based on our own studies, research and investigations, to provide readers with real-life examples and to be able to propose concrete methods to combat crime, which have been validated over several years by the authors' article.

Cyber attack analysis is performed in our own laboratories, using both advanced technologies and devices that simulate the behavior of traditional users, to mimic the real environment in which protection systems and those used by attackers are misled.

The number of malware samples and fake pages analyzed provided a clear view of favorite targets, final purpose, scenarios, evolution of cybercrime and the impact on potential targets.

## 4. STAGES OF THE PHISHING CAMPAIGN

At the initiation stage, the attacker sends a fraudulent e-mail claiming to come from the victim's bank asking the recipient to confirm the bank account details, with a warning that if the requested information is not provided, the account may be suspended. The user can consider the e-mail as legitimate because it uses the same graphics, trademarks and colors as the real bank. The collected data is transmited directly to the cybercriminal, who can then use it to commit other frauds, or resell them on the dark web.

An indication of susceptibility may be the sender's e-mail address, unknown to the recipient. Because phishing messages can often include receipts, invoices, or other types of documents that you may want to download in certain circumstances, we encourage you to be careful and consider whether the request makes sense before downloading the attachment and confirming first the identity of the sender. It is not normal to resolve banking issues through e-mail addresses that are at least visually unrelated to the institution and then, using the "*View Message*" button, direct the user to an illegal login area, providing attackers with bank credentials (Hong, 2012).

For this reason, websites and e-mail files should be run in environments isolated from the main operating system (sandbox), examining possible changes made to the system and checked for hidden, often harmful, activities.

The cybercriminal tries to mislead the potential victim by using the phrase "very important / urgent" in the subject of the email, so as to trigger a psychological reaction to cause her to click on the "View message" button, a button behind which a web address is attached. When you hover your mouse over this button, or when you press for 3 seconds on mobile devices, that built-in address (URL type) appears that does not match the official bank address.

Exploiting this human vulnerability could allow an attacker to use DHTML Edit ActiveX control (ActiveX control of the DHTML editing component in Microsoft Windows 2000 SP4 and Windows Server 2003 SP2 does not format HTML markup correctly, allowing remote attackers to execute arbitrary code) uploaded from the malicious website to modify content in a browser window in a different domain. Therefore, verify that the site URL starts with 'https', indicating that the site is secured with TLS / SSL encryption. A phisher can trick a user into clicking on a malicious URL that loads the DHTML Edit control, opens a new browser window for the trusted site, and then uses the vulnerable control to replace the content in the browser window that contains the reliable site. All other attributes of the browser window (SSL certificate information, page properties) would be for the legitimate website.

Attackers often register domain names that contain the name of the target institution to deceive customers who are satisfied that they see a legitimate name appearing in an address. A widely implemented version of this type of attack uses parts of a legitimate URL to develop a new address / domain name, very similar to the official address. The items in the email address will be modified so that they are sufficiently similar to a legitimate email address (numbers added, or letters changed).

Most phishing campaigns have a few things in common, which creates the premise of a valid construction in combating cyber attacks and reducing the number of victims. Here are some of them.

### 4.1 Using the bank resources

In order to promote a false identity as close as possible to that of the bank, attackers sometimes use its resources (Figure 1):

Logo;

The image / banner that appears on the front page of the bank;

Elements of the source code that support access protocols.


Source: authors' processing

**Figure 1. Examples of resource exploitation function**

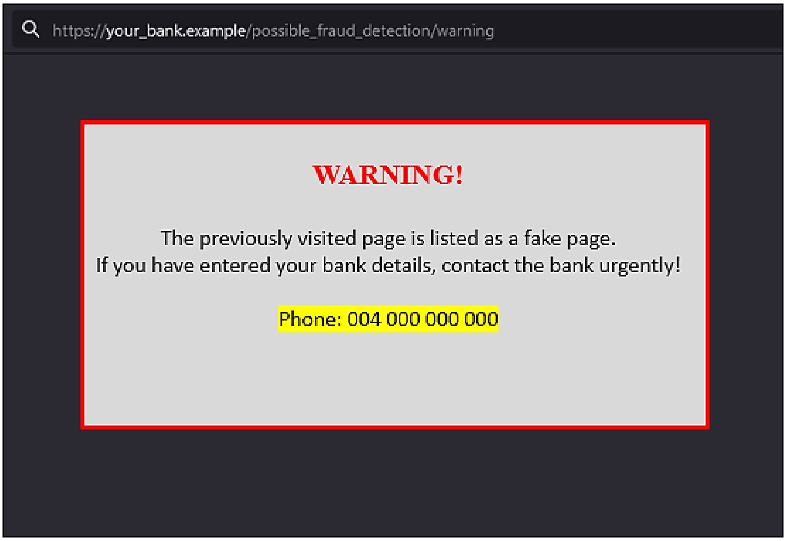
### 4.2 The victim visitors

Another common feature of phishing attacks is that immediately after the data collection is complete, most of the fake pages redirect the victim to the legitimate pages, in order to maintain his sense of security (Figure 2). It should be noted that the bank's servers identify and record the sources from which visitors connected, or from which page they were directed to them.


Source: authors' processing

**Figure 2. Examples of redirect**

If several customers reach the bank's page from such a common source, a mechanism (red flag) should be triggered to alert the bank's security department, to warn the customer that he may be a target of a cyber-attack and advise him to contact the bank to block the card, to check the online payment application, etc. (Figure 3).




Source: authors' processing

**Figure 3. Example of warning page**

It is also recommended to collaborate with external resources specialized in the detection of cyber-attacks and phishing pages, so that through an API (Application Platform Interface) suspicious pages to be included in the list of potentially malicious traffic sources.

This method will significantly reduce the number of victims, as customers will be notified in a timely manner that they have reached the bank's page after accessing a fake page, and if they have been persuaded to enter their bank details, to notify the bank immediately in order to receive support from its part.

### 4.3 Impersonating the customer

The success of a classic phishing attack is largely based on the credulity of customers and aims to obtain credentials, but without guaranteeing the access to bank accounts and implicitly to the transferring of existing amounts of money. The obstacles encountered are the difficulty of accessing stolen accounts, due to the security systems and procedures implemented by banking institutions for authorizing the client.

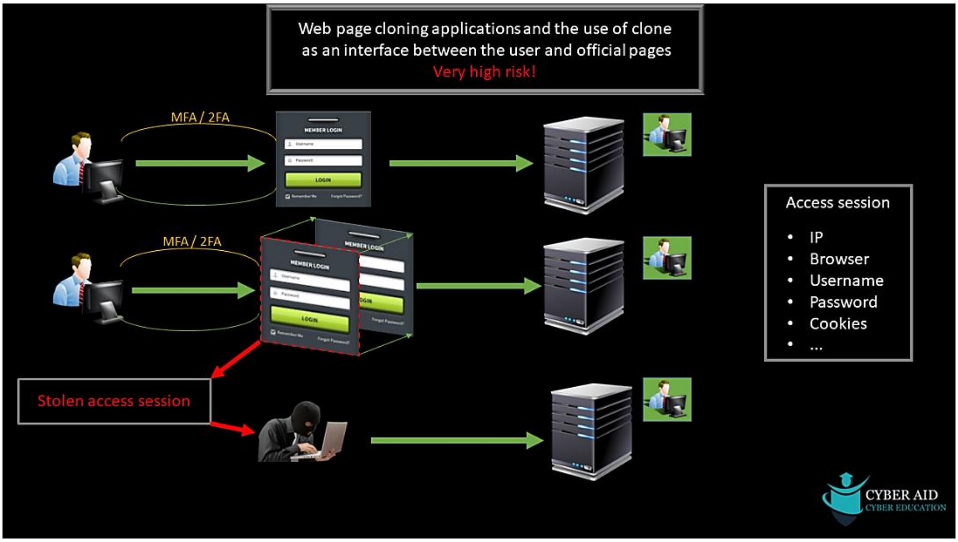
Resistance factors (education, procedures, technologies, etc.) against cyber-attacks lead criminals to develop new methods and technologies of attack. One of these methods is to try to fool not only the customer, but also the technological infrastructure of the banking institution, through the technical impersonating of the customer, through a communication / interception / maintenance API, so that the bank's server keeps in touch with what he thinks is the client's device, while the attacker has full access to the client's account.

Regarding the use of the API for intercepting / communicating / maintaining the authorization of access to the banking system (2FA - 2 Factor Authentication / MFA - Multi Factor Authentication), as mentioned above, the connection of the customer with the bank is done through a fake page that intercepts and stores the access data to the bank account, and after the completion of the client's activities the fake page to continue to keep the client's connection with the server active, even if he has left the banking platform (Figure 4).

The customer does not realize at this stage that he has become a victim and neither the banking technology can detect this, because the customer has validated the access to the account by providing user and password, plus additional authentication via SMS or authentication application (2FA / MFA).

The complexity, impact and involvement of both decision makers (customer and banking infrastructure) in the conduct and success of this cyber attack requires certain changes in the communication between the parties and it is:

- Limiting the number of transactions;
- Reduced access time to the system;
- Using a double SMS authentication (in response to SMS, not by completing the code on the platform);
- Using an authentication / confirmation application installed on a customer's mobile terminal.




Source: (Cyber AID, 2022)

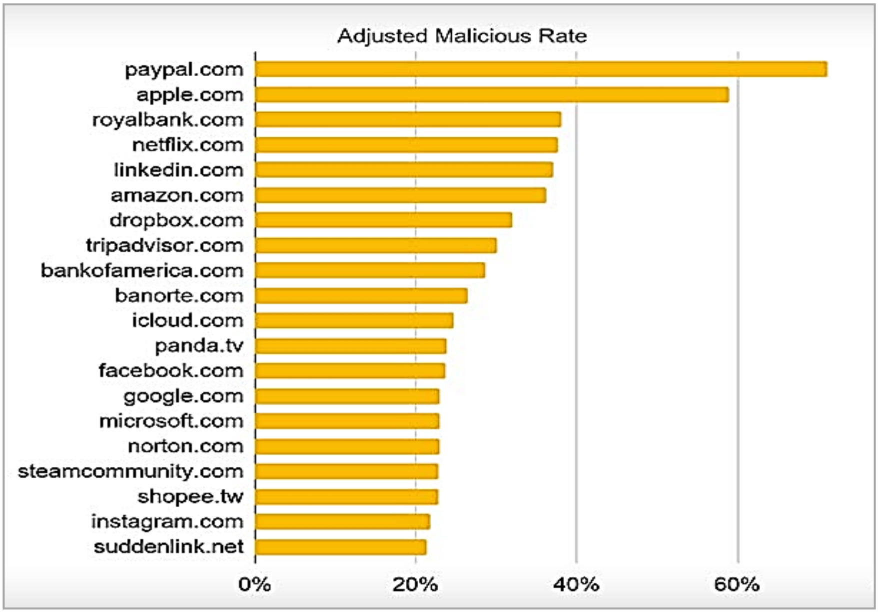
**Figure 4. Run a phishing attack using the client impersonation API**

All these additional actions are time consuming, but they can prevent losses for customers, expenses for institutions, or altering the image of the bank, etc.

### 4.4 Page-by-page attack

According to the previous descriptions, an important element, but problematic at the same time for the attackers, is the address of the fake page, which can be very similar to that of the banking institution (favoorite_bank.com), may contain components from the official address (your_favorite_bank.com), numbers instead of letters (fav0rite_bank.com), or may be an address of a compromised web page to which are added "persuasive" visuals (compromised_page.com/ favorite_bank / com / secure / authentication), but which at a glance more careful can create suspicion on the authenticity of the page they have reached.

Although this phenomenon of using compound domains or subdomains that imitate a legitimate domain name is not new, having a history of almost two decades (derived from cybersquatting and typosquatting), it has manifested itself more and more with the development of online payments and with the widespread adoption of e-government systems. Thus, international statistics place financial institutions in a major risk position.



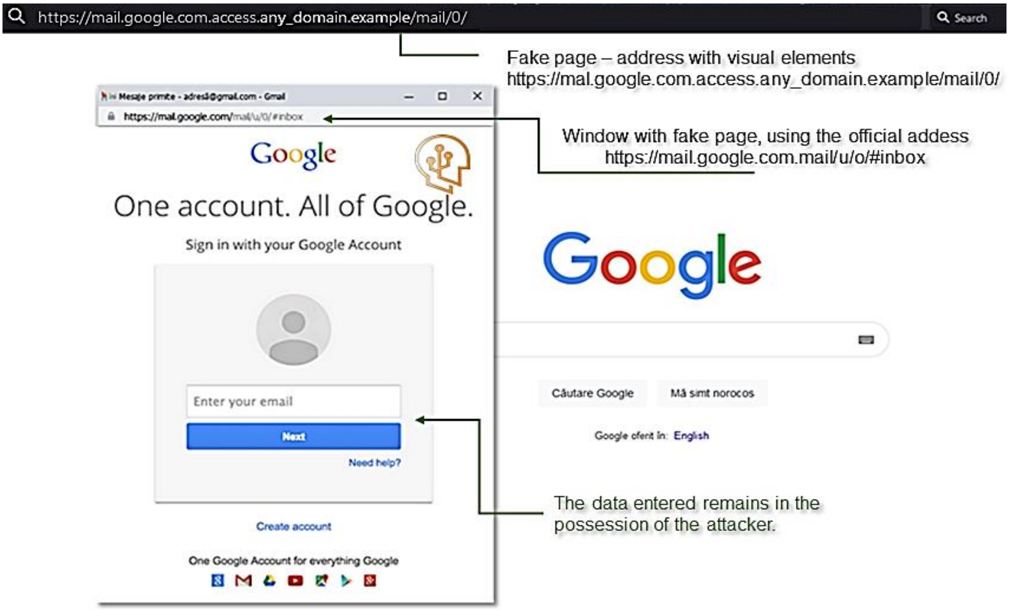

Source: (Olenik, 2020)

**Figure 5. Areas subject to cybersquatting attacks**

Variants of deception techniques can be of the combosquatting type which includes the name of the bank along with keywords such as “security” (bank-security [.] Com), homographsquatting, which uses Unicode characters with similar spelling (microsoft [.] Com), soundsquatting which uses phonetic similarities (4ever21 [.] com instead of forever21 [.] com), bitsquatting that modifies / replaces a character (0racle [.] com or mybenk [.] com), or levelsquatting (safety.microsoft.com.prepay .mdmfmztwjj.l6kan7uf04p102xmpq [.] bid).

Attackers use social engineering solutions that are not just based on cybersquatting, developing an attack method through which the success rate is higher. Regardless of the address from which the attack starts, whether similar or not, when accessing the fake page the user will open a second fake window, which contains the official address of the banking institution, as well as all the visual elements in the access area. If the main address of the fake page could alert the visitor, the second page displays exactly what the official login page contains, giving more credibility (Figure 6). Once the access data has been entered, it will enter the attacker's database and the victim will be directed to the bank's infrastructure.

The fight against this type of attack is done in the same way as in the previous cases - by blocking the exploitation of resources and implicitly identifying the source from which the client connects.




Source: authors' processing

**Figure 6. Example of false / fake page**

The strategies of cybercriminals are changing very quickly, including, among others, improvements to already existing malware codes. Flexibility in modifying the code sequences is particularly important because viruses are "customized" depending on the target, the type, and the mode of operation. In this way, the attack capabilities and the pressures to which the cyber defense systems and, last but not least, the employees are subjected, increase.

More specifically, as Paganini (2023) also mentions, some versions of the Xenomorph malware have targeted and are targeting hundreds of banks and companies, being "capable of completely automating the entire chain of fraud, from infection to the exfiltration of funds, making it one of the more advanced and dangerous Trojans". Artificial Intelligence is used both to strengthen protection systems and to increase the penetration power of viruses and to diversify the ways in which they act.

In this regard, according to a study carried out by PwC (2023), based on a particularly complex and well-developed questionnaire, over 45% of the experts and executives from the interviewed companies expect an increase in ransomware attacks (including phishing attacks), 29% of large companies expect an increase in OT (Operational Technology) attacks, over 38% expect serious attacks on Clou-type structures, but only 9% of respondents declared that they are in compliance with the regulations in the field and were able to meet most of the norms imposed by cyber security requirements.

## 5. PROPOSED MEASURES

The first line of defense in the overall strategy to protect assets and liabilities is built by educating end users. The second line of defense is represented by technical solutions, which can prevent certain attacks in the early stages, such as analyzing the level of vulnerability to prevent the materialization of threats, which leads to a decrease in the level of exposure of the human factor. The third line of defense is the adjustment of the legislative framework and the application of sanctions as a deterrent.

All these approaches can be combined to create powerful anti-phishing solutions.

One of the banks roles is to help their customers, from their first contact with banking technology, understand the reality and perceive the degree of danger through warning campaigns.

The advantage that digital criminals have over users with poor training in the field must be combated. Gaps in banking policies and procedures regarding customer contact and how to deal with crime should also be addressed, with some of the measures proposed below:

- to periodically distribute (by e-mail, or directly on the bank's website) general information about phishing;
- to send customers alerts about phishing scams, especially when a certain bank is directly targeted;
- to send reminders about customer contact policies and procedures, so that they can recognize unusual requests;
- customers to be trained to use only trusted Wi-Fi networks in banking transactions that use advanced encryption (minimum WPA2) to prevent DNS poisoning attacks.

When banks choose to implement a customer awareness program regarding phishing, it is important to educate their employees as well - especially employees who interact with customers and who should have solid information on this topic, so that they can respond to the full range of questions.

Users should be educated / instructed to report to the bank and subsequently to the institutions engaged in the fight against crime any suspicious transaction or operation. The bank must explain in detail the steps to be followed in case a customer suspects that he has become a victim and to support him in his approach.

The bank must inform customers that the reports are made in parallel or simultaneously with those to the DNSC (National Directorate of Cyber Security) by calling the telephone number 1911, or through the contact e-mail addresses on the site and to the specialized departments of the Ministry of the Interior. These issues are particularly important because more reporting can lead agencies to issue cyber security alerts nationwide and prevent new victims from registering. Depending on the severity of the phenomenon, mechanisms can be activated to train the Cyberint Department within the Romanian Intelligence Service, together with other competent institutions.

Constant e-mail and SMS alerts can remind customers that the bank does not request confidential information and does not send "urgent" account blocking messages. Sustained efforts are needed to change the mindset of the user and to support the development of a cybersecurity-oriented culture (Crossler *et al.*, 2013).

The banking system in relation to customers must radically change its approach to the subject, because users tend to treat certain rules superficially, either because they do not know them, or because they do not understand them.

## 6. CONCLUSIONS

In the end, a conclusion section is required. Although cyber education is one of the most effective barriers to protection against phishing, this threat will be difficult to completely eliminate due to its increasing complexity, refined attacks, social engineering elements and constantly evolving technical tools. There is a repositioning of abusers who switch from traditional emails to social media-based phishing, there is a permanent gap between sophisticated phishing attacks and implemented countermeasures (Jansson and Solms, 2013).

Phishing awareness campaigns need to be promoted not only to bank customers and employees, but also to law enforcement personnel who are able to investigate economic and financial crimes online. Customers need to know the level of potential financial impact resulting from a successful cyber attack. Banks must try to combat the ever-changing capabilities of cyber attackers by creating safer and tailored online applications with the potential to detect phishing scams faster. Employees who transfer funds on a regular basis, manage sensitive data, or engage in high-risk operational activities need additional training on how to detect and avoid more sophisticated phishing scams. Law enforcement officials should also be familiar with the tools used in phishing attacks and understand how they work, in order to properly attribute the attacks to perpetrators and propose more effective countermeasures.

Continuous training on cybersecurity risks can be a key to avoiding losses and reducing impact. It is necessary to reduce the intervals between training periods in terms of updating cybersecurity skills, increasing their pace from a few months to a maximum of 1-2 years compared to other areas where technological developments and slower legislative changes allow for refresher rates of training / certifications every 5 years.

In this article we wanted to emphasize the importance of developing several anti-phishing techniques, with the role of detecting and blocking attacks, as well as a clear taxonomy to understand as much as possible of the phishing life cycle.

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# PUBLIC SPENDING AND OUTPUT GROWTH IN EASTERN EUROPE. A STRUCTURAL VAR APPROACH

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**Abstract**
*The transmission of the impact of public spending on GDP growth is determined directly or indirectly by different structural characteristics of economies. The realization of the economic and social objectives in Eastern European countries was significantly influenced by the fiscal policy, especially the expansionist one. In this article, we studied the impact of public spending policies on GDP growth for six Eastern European economies: Bulgaria, Croatia, Hungary, Poland, Romania and Slovakia, starting from the idea that their common communist past and the organization of the economy determine the effectiveness of fiscal policy. The methodology used in the analysis assumed Structural VAR, the analyzed period being 1999Q1-2022Q3, with quarterly data. The obtained results confirmed the fact that public expenditures significantly influence the level of output growth for all six countries, but with essential differences. The effectiveness of fiscal incentives is positive and significant for all analyzed countries, playing an important role. For Bulgaria, in the first quarter the fiscal shock is maximum (0.174), following which it may gradually decrease to reach 0.164 after 12 quarters. For Czechia, the impact of the fiscal shock is minor in the first 2 quarters (below 0.01), and then increases to 0.06 after 2 years. For Hungary, the initial fiscal shock has a low value of 0.01, to later increase to 0.039. For Poland, the impact of the fiscal policy is higher in the first quarters, reaching 0.174, to then decrease to 0.164 after 12 quarters. For Romania, the public spending policy has a lower impact in the first two quarters of 0.081, so that it subsequently improves to 0.082. But the biggest impact of public spending is manifested in Slovakia, where it starts for the first semester from 0.655 and subsequently decreases to 0.520 in 12 quarter. The subsequent discussions that will take into account the effectiveness of the public spending policy in Eastern Europe can use the results of this study as a starting point in order to identify the determinants of the budgetary characteristics for the respective economies.*
**Keywords:** *public spending; output growth; Structural VAR; Eastern Europe countries.*
**JEL Classification:** C22, C32, E62, G18

## 1. INTRODUCTION

The structural characteristics of economies directly or indirectly influence the way to transmit the impact of public spending on GDP. In European countries, the fiscal policy and especially the expansionist one significantly influences the fulfilment of economic and social objectives. In this article we set out to study the impact of public expenditure policies on the evolution of GDP for six Eastern European economies: Bulgaria, Croatia, Hungary, Poland, Romania and Slovakia. The motivation for choosing the six eastern communist countries is based on their common communist past and the similar organization of the economy, essential factors in the effectiveness of fiscal policy (Stoian and Campeanu, 2010). Eastern European countries have a long history of using expansionary budget policies. In the 90s, during the transition to the market economy, the authorities' use of fiscal expansion generated a hyperinflationary spiral, which was later tempered by controlling exchange rate fluctuations (Ianc and Turcu, 2020). After the year 2000 and the accession to the EU, through large capital increases and rapid privatizations, a strong increase in domestic demand and domestic GDP was determined. However, a negative thing that happened to all Eastern countries was the use of pro-cyclical fiscal policies during economic boom periods (Boiciuc, 2015). The strong economic growth generated an increase in the incomes of the population and companies and implicitly in the tax base of the state, which led to an increase in public expenditures. During the recession periods, the exact opposite happened: the financial crises caused a sharp drop in domestic demand, economic activity and state revenues. The previously realized state expenditures remained at the same level or less low, which implied the contracting of loans and the increase of the public debt (Deskar-Škrbić and Šimović, 2017).

The methodology used in the empirical approach is structural VAR, developed by Blanchard and Peroti (2002), methodology becoming standard in the analysis of structural shocks applied in the economy. The period used in the analysis is 1999Q1-2022Q3, the longest period for which we had available data, the data frequency being the quarter. The most important thing to achieve in the study of the impact of public spending on GDP is the correct identification of shocks in the economy. The identification of government expenditure shocks centers around the approach commonly used in Blanchard and Perotti (2002). The analysed period is a long period that includes four important events for Eastern European economies: two periods of strong growth, the one related to the level of EU accession (2000-2007), full integration and the adoption of the euro (2011-2019), but also two strong periods of the crisis that hit these countries hard: the great financial crisis of 2008-2010 and the Covid19 crisis of 2020-2021. Throughout this period, interest in public spending policy was extremely high, citizens and politicians expecting it to be effective in economic recovery (Kilponen *et al.*, 2015). Due to the wide possibilities of using incentives in different branches of the economy and the possibilities of thus influencing the economic cycles, public spending policy has become the most important tool used in practice. All the world's economies have used public spending policy instruments for economic recovery, but in a different way: developed countries have implemented massive stimulus packages, and emerging countries have used programs to increase the efficiency of spending, especially achieving pro-cyclical increases in them previously (Ilzetzki, Mendoza and Végh, 2013). Until now, at the level of empirical studies, there is no consensus regarding the effect of public spending policy on macroeconomic variables, there are two main schools of thought: Keynesian and neoclassical (Auerbach and Gorodnichenko, 2012). The Keynesian theory starts from the idea that the temporary increase in public spending generates a positive shock in the economy by increasing aggregate demand and labour demand, which in turn lead to an increase in consumption and wages. The neoclassical theory starts from the interdependence between public expenditures and taxes; the current increase in public spending will generate higher taxes in the future. But the increase in taxes to cope with the increase in expenses will be followed by negative effects: the reduction of households' consumption and the demand for work. However, what unites the two theories is the fact that both predict an increase in production, but through different instruments (Ćorić, Šimović and Deskar-Škrbić, 2015). The results obtained from the study confirm with essential differences for each of the Eastern European countries that public expenditures considerably influence the output level. For all six analysed countries, the effectiveness of financial incentives achieved through public spending has an important role in the economy and is positive and significant.

## 2. LITERATURE REVIEW

The impact of public expenditure policies on economic variables has not yet established a unanimous consensus in the specialized literature. Mainly, empirical studies take into account two main points of view that have developed two theories in economics: the New Keynesian theory and the neoclassical theory. From the point of view of the methodology used, three main applications have been applied in the literature: VAR, structural VAR and DSGE. In all these methods, different ways of identifying shocks are practiced in order to be able to estimate the effects of fiscal policy on economic activity. Lately, numerous studies are starting to use boom and recession periods and show that the impact of fiscal measures is different, being greater in recession periods (Fatás and Mihov, 2001; Mountford and Uhlig, 2009; Corsetti, Meier and Müller, 2012).

The correct identification of fiscal policy shocks is the main problem in VAR type analysis. The main and most famous method is the one developed by Blanchard and Perotti (2002) who take into account the decisional gaps between fiscal and institutional policies starting from the automatic stabilizers of the macroeconomic variables. The second category involves the use of a dummy variable for unforeseen and exogenous fiscal events, such as the strong increase in public spending (Auerbach and Gorodnichenko, 2012). The third category involves, within the VAR models, the imposition of sign restrictions starting from macroeconomic fundamentals in a direct way on the impulse response functions (Corsetti, Meier and Müller, 2012). The fourth category identifies the shocks through the Cholesky decomposition and later uses these identifications to analyze the impact of the shocks at the macroeconomic level (Mountford and Uhlig, 2009). However, the article by Blanchard and Perotti (2002) remains the fundamental work for the study of the impact of fiscal policy on macroeconomic variables.

Blanchard and Perotti (2002) analyze the impact on the US economy in the post-war period by shocks in public spending and taxes. The authors use a Structural VAR model and discover that the two variables, expenses and taxes, have a different impact on the economy: the former have a positive effect, and the others have a negative effect.

Mirdala (2009) analyzes for the first time the countries of Eastern Europe (Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia) in a study on the effects of discretionary fiscal policy for public spending. The authors show that public spending has a positive impact on GDP, but differently for the studied states: stronger in Czechia and Bulgaria, and weaker for the other states.

Cuaresma, Eller and Mehrotra (2011) analyze the transmission of fiscal shocks between the two parts of the EU: West - East for five countries (Czechia, Hungary, Poland, Slovakia and Slovenia). Starting from the external stimulus, the authors also study the effect of internal fiscal shocks on macroeconomic variables. The authors discover that at the domestic level, the response of the eastern countries to the external fiscal expansion was fiscal relaxation, with stronger effects on public expenditures than on revenues. On the other hand, for the domestic fiscal policy, the effects of public spending shocks on GDP are different depending on the time horizon: short (negative for Hungary, Poland and Slovakia) and long (positive for Hungary, Slovenia and Slovakia).

Deskar-Škrbić and Šimović (2017) analyze three former Yugoslav countries (Croatia, Slovenia and Serbia) using an extended SVAR model by using macroeconomic variables (trade openness and debt). The authors show that the effects of discretionary shocks such as public spending are significantly influenced by these macroeconomic variables taken into account, being higher for those countries that present higher values of them.

## 3. MODEL AND DATA

The sample of countries analysed consists of six eastern communist countries, currently members of the EU: Bulgaria, Croatia, Hungary, Poland, Romania and Slovakia. The studied period is the longest period for which there are available data, namely 1999Q1 – 2022Q3, the frequency of the data series being quarterly. For some countries in the sample, there were data from 1995, but for a uniform perspective approach on all countries, the period starting with 1999 was considered. The source of the data is the EUROSTAT and IMF databases. All data series were seasonally adjusted and subsequently transformed using the logarithm. To create the economic model, the following five macroeconomic variables were taken into account: real GDP, public spending, domestic prices (inflation), the share of consumption and the share of wages. The series were seasonally adjusted using the ARIMA Eurostat method and stationarity was obtained using the Hamilton filter. The choice of the five macroeconomic variables was made from the consideration of capturing the effects for the propagation of exogenous shocks of government spending in the economy. Real GDP represents total economic activity, and private consumption is the most important component of domestic demand. The level of prices and the share of wages show the effects of shocks on the level of aggregate supply, but also because they have a higher level of rigidity compared to the other macroeconomic components.

The model used in the analysis is a classic VAR, but in a reduced form (Caldara and Kamps, 2017):

$$Ax_t = C(L)X_{t-1} + B\varepsilon_t \qquad (1)$$

Where: A is the matrix of contemporary relationships between variables; xt is the vector of macroeconomic variables composed of public expenditures, GDP, inflation, private consumption and the level of wages in the economy; C(L) is a matrix for the duration of the lag between macroeconomic variables; B is the way in which structural shocks influence the variables in the model. Equation (1) represents a general equation and involves identification problems so that it must be rewritten in the form of an unrestricted VAR as follows (Mountford and Uhlig, 2009):

$$X_t = A^{-1} C(L)X_{t-1} + A^{-1} B\varepsilon_t \qquad (2)$$

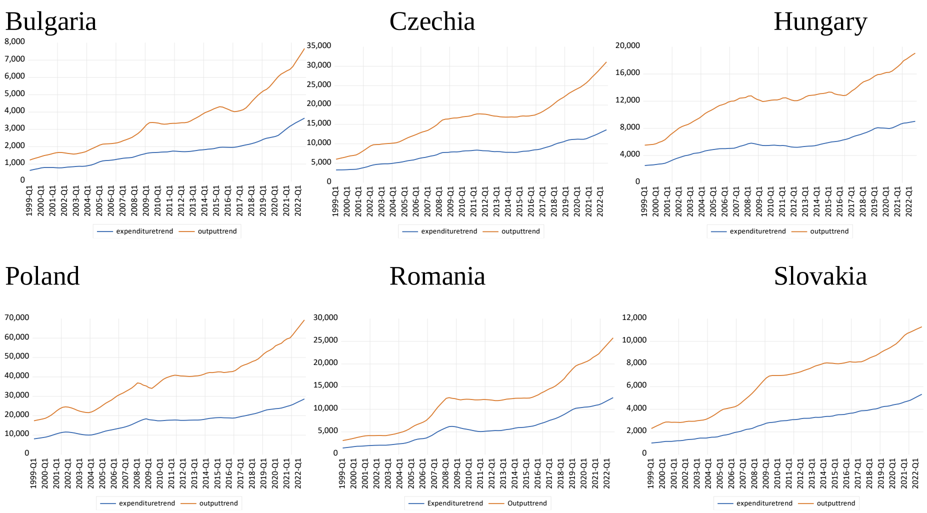
In the specialized literature, certain restrictions are imposed on the macroeconomic variables for estimating the reduced form. Economic theory and research presupposes the following current restrictions on the variables: public spending, the main independence is not simultaneously affected by any shock; Real GDP is simultaneously influenced only by the fiscal shock; inflation reacts simultaneously to shocks from all system variables; private consumption and the level of salaries are simultaneously influenced by the fiscal shocks of public expenditures and GDP (Caldara and Kamps, 2017).

$$\begin{matrix} 1 & 0 & \alpha 31 \\ \alpha 21 & 1 & \alpha 23 \\ 0 & 0 & 1 \end{matrix} \text{ x } \begin{matrix} \mu GDP \\ \mu Inflation \\ \mu PublicSpend \end{matrix} = \begin{matrix} \varepsilon GDP \\ \varepsilon Inflation \\ \varepsilon PublicSpend \end{matrix} \qquad (3)$$

The identification of structural shocks requires the calculation of residuals μt from the previous matrix, on the right side. These residuals can be considered forecast errors and economically have no interpretation in themselves. However, in the construction of the SVAR model, they are of particular importance; can be considered as linear combinations of structural shocks that influence the economy simultaneously. The imposition of these additional restrictions lead to the Structural VAR representation of the model.

Government expenditures have different manifestations and trajectories for the six Eastern countries (Figure 1). However, there is a common trend for the eastern countries of their continued growth until the end of 2007, when they stagnated and subsequently even experienced decreases after 2009 (Stoian and Campeanu, 2010). For a number of countries (Hungary, Poland and Romania) similar trends are manifested, but with some differences: strong growth until the end of 2008, so that in the financial crisis it stagnates, and after 2016 it continues to grow.

GDP has the same sustained growth trends until the financial crisis of 2008 for all Eastern European states (Figure 1). After the onset of the financial crisis in 2008, GDP starts to decrease, for a number of countries (Czech Republic, Hungary and Romania) being more strongly affected by the recession. After 2010, however, the indicator begins to increase and rises strongly above the pre-crisis level for all eastern states.

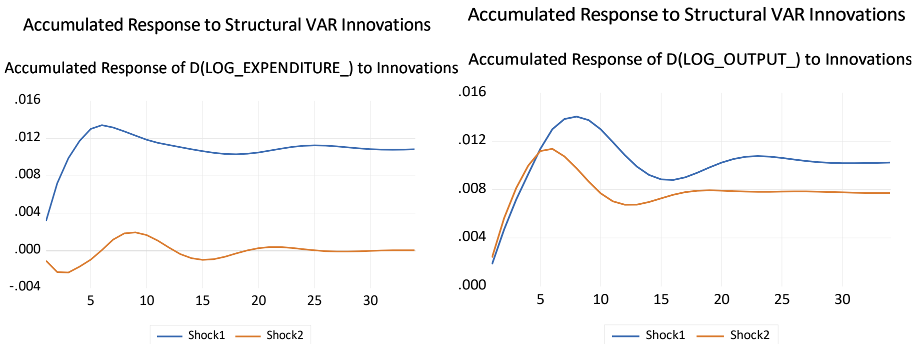



Source: the authors

**Figure 1. Evolution of GDP and government expenditures in Eastern European countries**

## 4. EMPIRICAL RESULTS

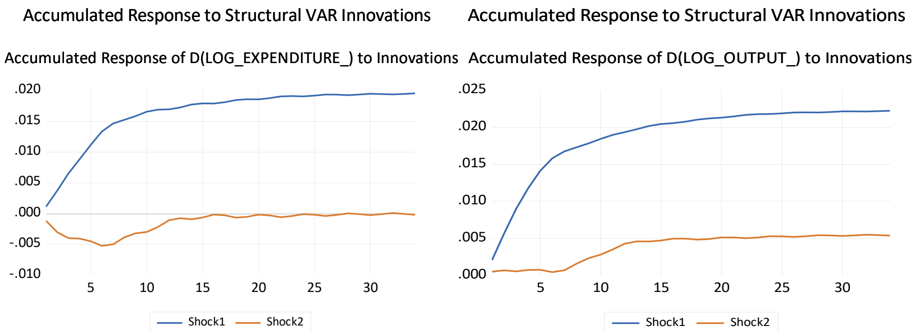
In the Structural VAR Representation the most important is the response impulse function. Figures 2-7 show the impulse response functions for each of the six analyzed countries and each variable: public pension and GDP. The impulse function that is of interest is the cumulative function that graphically represents the effects of exogenous structural shocks in public spending for a 95% confidence interval (Ianc and Turcu, 2020). For Bulgaria, the impact of public spending shocks on GDP was positive and statistically significant. For this country, the increase of one percentage point in government spending has the effect of increasing the GDP with values between 0.08-0.12 percent for the first four years after the shock. Government spending can be successfully used to stimulate the economy in this country.




Source: the authors

**Figure 2. SVAR representations for GDP and public expenditures: Bulgaria**

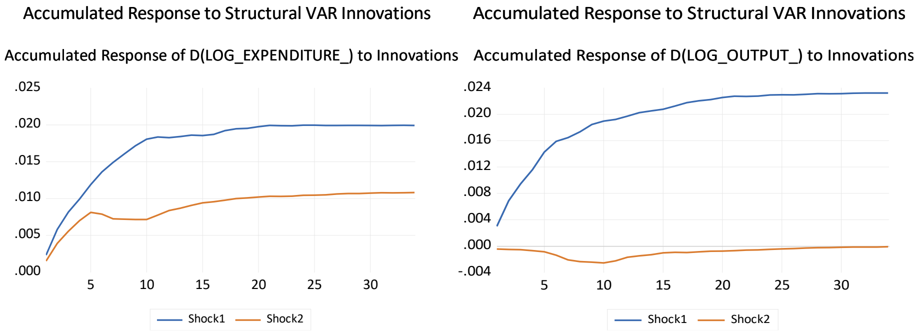
For Czechia, the effects of public expenditure shocks are statistically significant and positive (Figure 3). However, the impact of public spending is different: in a first phase of 5 quarters it is very small (0.001 percent) in order to increase for the next 5 quarters and to stabilize after 12 quarters at an effect of 0.005.




Source: the authors

**Figure 3. SVAR representations for GDP and public expenditures: Czechia**

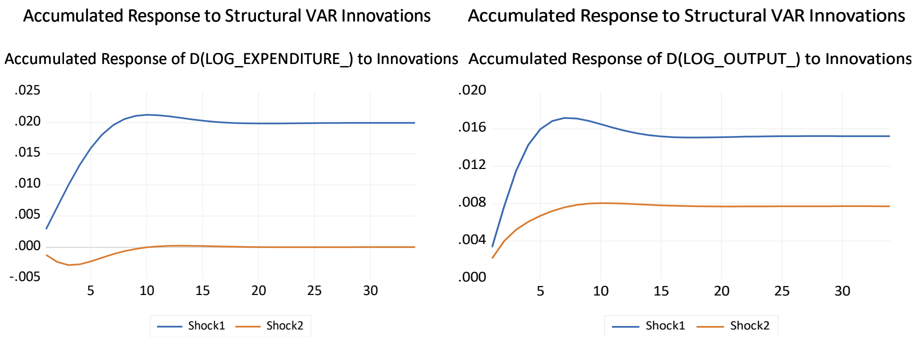
For Hungary, the effect of shocks in government spending is somewhat surprising: negative and significant for the first 25 quarters after the initial fiscal shock. For this country, the use of these variables to influence the economy proves to be unproductive and resource-consuming: decreases of up to 0.004 obtained after the first 10 quarters. Afterwards, GDP returns to its previous values, but without spending having a positive effect on it. Starting from this result, other factors with a positive influence on GDP must be identified for the Hungarian economy, public spending not being one of them.




Source: the authors

**Figure 4. SVAR representations for GDP and public expenditures: Hungary**

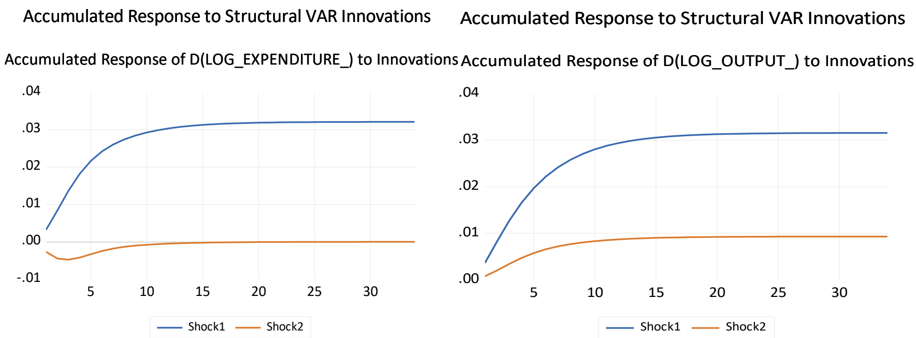
For Poland, the results obtained are positive and statistically significant (Figure 5). The shock caused by the one percentage point increase in public spending leads to an immediate increase in GDP until the 10th quarter to values of 0.08, after which it stabilizes. At the beginning of the period, the effects are manifested by slight and progressive increases for the first 10 quarters.




Source: the authors

**Figure 5. SVAR representations for GDP and public expenditures: Poland**

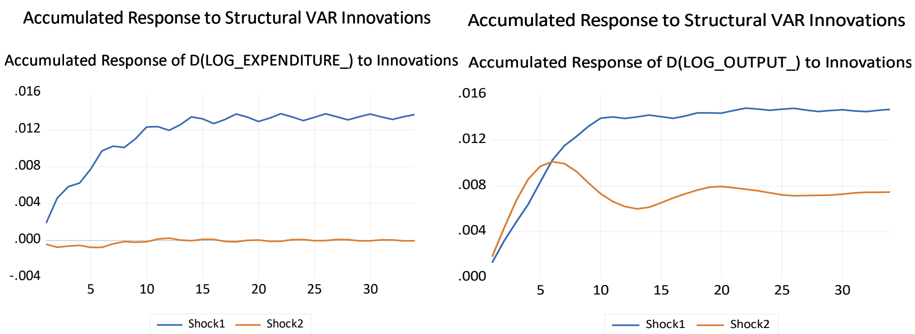
For Romania (Figure 6) we can see that the GDP reactions to the fiscal shock are extremely weak: the increase of one percentage point in fiscal expenditures only generates an increase of only 0.01 percentage points in GDP. The GDP increase is realized gradually after the first 10 quarters, being still positive, but with extremely low values, never exceeding the maximum value of 0.01 (Boiciuc, 2015).




Source: the authors

**Figure 6. SVAR representations for GDP and public expenditures: Romania**

For Slovakia (Figure 7), the effects of the fiscal stimulus on GDP are different over time and in the size of the effects. Significant for this country is that the impact manifests itself in jumps: in a first phase they have a steep and strong impact in the first 5 quarters after the occurrence of the shock up to 0.10, so that it can decrease for the next 10 quarters up to 0.05. Starting with the 15th quarter, the value of the fiscal impulse again begins to manifest itself on the GDP, reaching a stabilization around the value of 0.08.




Source: the authors

**Figure 7. SVAR representations for GDP and public expenditures: Slovakia**

Another important component of SVAR analysis is variance decompositions. A comparative summary for the six analyzed Eastern European countries of the variance decompositions is presented in Table 1. The analysis period presented in the table is the first 12 quarters after the shock in public expenditures. The present values show the effects on GDP determined by the increase of one percentage point in government spending. As can be seen from the data in the table, the effects of fiscal policy are different for the analyzed countries. The strongest effects are found for Slovakia (0.65-0.51), Bulgaria (16.26-17.48) and Poland (16.03-17.28). The lowest effects are found for Czechia (0.91-6.33), Hungary (0.68-3.09) and Romania (7.01-8.14).

**Table 1. SVAR variance decompositions for Eastern European countries**

| Country | Period | Expenditure | | Output | |
|---|---|---|---|---|---|
| | | Shock1 | Shock2 | Shock1 | Shock2 |
| Bulgaria | 3 | 91.50634 | 8.493656 | 82.51449 | 17.48551 |
| | 6 | 93.80604 | 6.193960 | 83.73801 | 16.26199 |
| | 9 | 93.14155 | 6.858447 | 83.48203 | 16.51797 |
| | 12 | 93.00966 | 6.990336 | 83.56652 | 16.43348 |
| Czechia | 3 | 73.27251 | 26.72749 | 99.00790 | 0.992104 |
| | 6 | 82.79030 | 17.20970 | 99.08561 | 0.914386 |
| | 9 | 80.34201 | 19.65799 | 96.16664 | 3.833357 |
| | 12 | 77.12501 | 22.87499 | 93.69656 | 6.303437 |
| Hungary | 3 | 68.14987 | 31.85013 | 99.31062 | 0.689378 |
| | 6 | 69.99537 | 30.00463 | 98.85178 | 1.148218 |
| | 9 | 71.87566 | 28.12434 | 97.69249 | 2.307514 |
| | 12 | 71.33918 | 28.66082 | 96.90089 | 3.099105 |
| Poland | 3 | 91.50634 | 8.493656 | 82.51449 | 17.48551 |
| | 6 | 93.80604 | 6.193960 | 83.73801 | 16.26199 |
| | 9 | 93.14155 | 6.858447 | 83.48203 | 16.51797 |
| | 12 | 93.00966 | 6.990336 | 83.56652 | 16.43348 |
| Romania | 3 | 86.09532 | 13.90468 | 92.98719 | 7.012809 |
| | 6 | 89.41105 | 10.58895 | 91.86972 | 8.130277 |
| | 9 | 89.40892 | 10.59108 | 91.85257 | 8.147428 |
| | 12 | 89.44655 | 10.55345 | 91.86983 | 8.130172 |
| Slovakia | 3 | 97.59706 | 2.402941 | 34.40859 | 65.59141 |
| | 6 | 98.11407 | 1.885931 | 46.91403 | 53.08597 |
| | 9 | 97.18595 | 2.814050 | 48.99591 | 51.00409 |
| | 12 | 96.97903 | 3.020974 | 47.91113 | 52.08887 |

Source: the authors

## 5. CONCLUSIONS

The expansionist fiscal policy leads to an increase in GDP in Eastern European countries with the exception of Hungary. Both the effects on economic activity and the shock itself are quite persistent, although the positive effect on GDP is no longer significant after about 2-3 years. The empirical results confirmed our hypotheses that the momentum of public spending is different for the analyzed countries. For Slovakia and Bulgaria this is a significant one, since it is a cumulative effect: initially there is a steep increase in GDP, followed by a subsequent decrease in the medium term, so that in the long term, it stabilizes at a positive value. For the most developed countries in the region, Czechia and Poland, the impulse results are lower, between 0.05 and 0.08. For Romania, the fiscal parameter increases the GDP extremely little with values below 0.01.

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# INVESTIGATING THE INTEREST RATE PASS-THROUGH DURING THE COVID-19 PERIOD. EVIDENCE FROM ROMANIA

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**Abstract**
*Interest rate pass-through is a critical issue in monetary policy, making it important for policymakers to understand how changes in central bank interest rates are transmitted to the broader economy. In this paper we investigate the interest pass-through process during COVID-19 period in Romania using both ordinary least square (OLS) and quartile regression (QR). According to the reported results, the interest rate pass through was more intense during the pandemic years. However, the transmission is not homogeneous being sensitive to the loan product architecture and the associated maturity.*
**Keywords:** *monetary policy; interest rate pass-through; COVID-19.*
**JEL Classification:** C58, E4, E5

## 1. INTRODUCTION

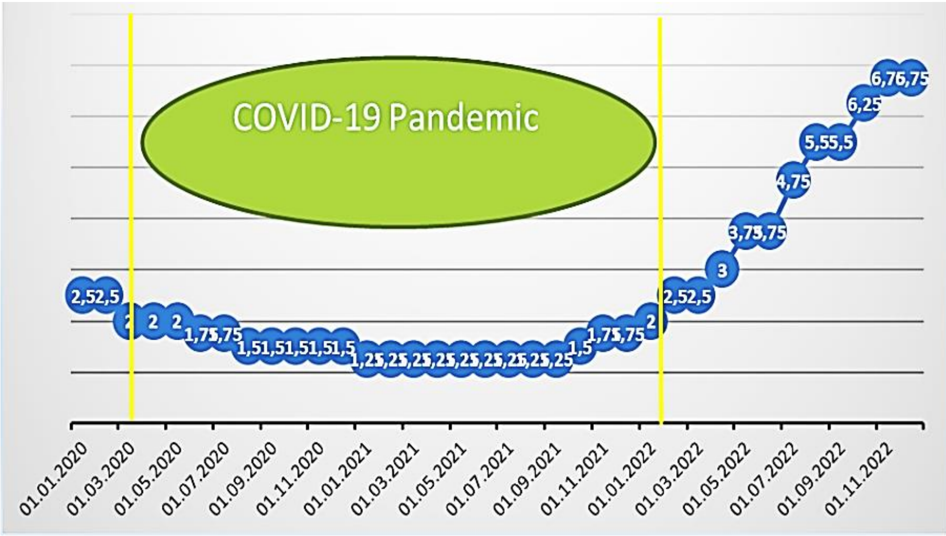
The COVID-19 pandemic has caused huge damage to economies and financial institutions around the world, and many individuals and firms faced severe disruptions in their income. To reduce economic losses during the health crisis, governments initiated a series of stimulus measures, such as VAT reduction, grants for small and medium enterprises, or moratoria on debt repayments. The latter was devoted to ease the loan terms for the affected customers and, in most of the countries, it involved the complete postponement of payments for different time periods. Given this reality, economic agents, as well as governments, expected banks to play a crucial role in COVID-19 shock absorption through the aforementioned moratoria and other support measures (Demirguc-Kunt, Pedraza and Ruiz-Ortega, 2021). However, these moratoria have a significant impact on the bank's balance sheet via interest rate opportunity costs, but also because restructured loans could become nonperforming, which would require additional provisioning.

Furthermore, the emergence of the COVID-19 pandemic has greatly changed the short-term risks and accentuated some of the preexisting vulnerabilities. The most important worldwide vulnerabilities that were accentuated by the health crisis and which will continue to persist in the coming period are the high level of indebtedness, especially of the public sector and the pressures on the solvency and liquidity of credit institutions, considering the prospects on profitability and those on asset quality.

Moreover, Russia's invasion of Ukraine on February 24, 2022 was a turning point for Europe. Russia is an important supplier of hydrocarbons on the global market, and until the outbreak of the war in Ukraine, it was the most important for the European Union. In the context of the war crimes of the Russian army in Ukraine, the public pressure on the governments and the authorities of the European Union to give up the import of hydrocarbons from Russia, to stop financing the Russian war in Ukraine in this way, is extremely strong.

In the case of oil, the European Union has already found alternative solutions to Russian oil. As a result, the price of Brent oil, which is the one relevant for the countries of the European Union, reached a maximum of USD 123.5/barrel at the beginning of March 2022. Subsequently, also supported by the increase in production in Norway, Canada and the United States, as well as the release of reserves by the United States, the price of oil has gradually reduced. In addition, both Russia and Ukraine are major global exporters of grain. Russia, to put additional pressure on the countries of the European Union, decided to stop the export of grain to these countries. Ukraine, amid the blockade it is subjected to by Russia and the destruction of the transport infrastructure by the Russian military, cannot continue to export agricultural products. Hence the shock to global food prices, a shock that was little mitigated by the Istanbul agreement over the summer on shipments under Turkish guarantees and with Russian consent of Ukrainian grain.

Given this international context the inflation rate increased intensely in Romania in 2021 and 2022, a fact that triggered the immediate intervention of the National Bank of Romania. Regarding monetary policy, high inflation, although also generated by factors that cannot be influenced by monetary policy (such as energy prices), requires a strengthening of interventions on the money market. The central bank has already raised the policy interest rate, and these increases will continue. But the increase in interest rates negatively affects demand and, implicitly, economic growth. We can see in Figure 1 the evolution of the monetary policy rate in Romania in the last three years. Against this background it is of interest to study the interest rate pass-through, considering the structural changes across the banking system in Romania caused by COVID-19 pandemic.




Source: own processing

**Figure 1. Monetary policy rate in Romania (%)**

In this paper we study the interest pass-through process during COVID-19 period in Romania. We use both simple ordinary least square (OLS) and quartile regression (QR) to investigate the interest rate pass-through from 2005m01 to 2022m12. As expected, the policy rate changes are positively associated to several banking credit products rates. However, the interest rate pass-through process was not visible during COVID-19 pandemic based on OLS regression in the multivariate analysis. In addition, the QR results revealed that interest rate pass-through is more pronounced across superior quantiles (which are proxied for the shar interest rate increases in 2022) compared to inferior or middle quantiles.

## 2. LITERATURE REVIEW

Interest rate pass-through is a critical issue in monetary policy, making it important for policymakers to understand how changes in central bank interest rates are transmitted to the broader economy. In this literature review, we will examine the current state of research on interest rate pass-through, specifically focusing on three main areas: the mechanisms of interest rate pass-through (Smets and Wouters, 2002), the impact of interest rates on the economy (Gali and Gertler, 1999), and the factors affecting interest rate pass-through (Yeyati and Micco, 2007; Laeven and Valencia, 2012; Jiménez-Rodríguez and Morales-Zumaquero, 2016).

A range of mechanisms have been postulated to explain the transmission of interest rates to the broader economy. The first channel is the bank lending channel (Smets and Wouters 2002). Banks borrow funds from the central bank and then lend these funds to customers at a higher rate of interest, generating profit. When the central bank increases its interest rate, banks increase their lending rates, and this increase is passed on to customers in the form of higher loan rates. The second channel is the asset price channel. When the central bank increases its interest rate, investment becomes less attractive, and investors shift their money from stocks and bonds to cash, causing a decline in asset prices. Conversely, a lower interest rate encourages investment and can lead to an increase in asset prices. The third channel is the exchange rate channel. When a central bank raises its interest rate, its currency becomes more attractive relative to other currencies, increasing demand for the currency and leading to an appreciation of the exchange rate.

The impact of interest rates on the economy is complex and varies across countries and economic conditions (Gali and Gertler, 1999). A higher interest rate will discourage borrowing and spending, leading to lower inflation rates, but also lower investment and growth (Gali and Gertler, 1999). In contrast, lower interest rates can stimulate investment, growth, and inflation, but can also lead to higher consumer prices (Gali and Gertler, 1999; Rudebusch and Svensson, 1999). The empirical evidence on the relationships between interest rates and the economy is mixed (Gali and Gertler, 1999). Some studies have found a strong relationship between interest rates and inflation, while other studies have found that other macroeconomic variables, such as exchange rates or oil prices, can mediate the relationship between interest rates and the economy.

## 3. DATA DESCRIPTION

We use as dependent variables the monthly average interest rate for several products such as mortgage loans to household (MLH), consumer loans to households (CLH) and business loans to firms (BLF). We take into consideration three maturities, namely less than 1 year (ST – short term), 1 to 5 years (MT – medium term) and >5 years (LT – long term). The data are extracted form National Bank of Romania website. As explanatory variables we use the loans to deposit ratio (CDR), the level of non-performing loans (NPL), the country level of financial stress index (CLIFS), the business confidence index (BCI) and the yield of the 10 years government bond (GOV10Y). As a key explanatory factor, we use the central bank policy rate (PR). Before running the regression, we need to investigate the stationarity of the variables. The results of the ADF test are Table 1.

We notice that some variables are stationary I (0) while others are I (1). To avoid running a spurious regression we use the first difference in all specifications. In addition, the correlation among the dependent variables is less than 40% in absolute values, regardless the selected pairs of covariates, so the multicollinearity phenomenon can be overlooked in the empirical analysis.

**Table 1. ADF test**

| Variable | Test | P-value | Variable | Test | P-value |
|---|---|---|---|---|---|
| MLH_MT | -1.2178 | 0.2044 | CDR | -2.1387 | 0.0316 |
| MLH_LT | -0.1942 | 0.6151 | NPL | -2.7573 | 0.0666 |
| CLH_ST | -1.7156 | 0.4218 | CLIFS | -4.9157 | 0.0001 |
| CLH_MT | -4.3691 | 0.0000 | BCI | -3.0580 | 0.0315 |
| CLH_LT | 1.1792 | 0.9386 | GOV10Y | -1.3788 | 0.5980 |
| BLF_ST | -1.6638 | 0.4480 | PR | -0.4258 | 0.5284 |
| BLF_MT | -1.4016 | 0.1496 | | | |
| BLF_LT | -1.3341 | 0.1683 | | | |

*Note: We use trend and intercept in all specifications*

## 4. RESULTS

We first run a univariate regression to capture interest rate pass-through during the COVID-19 period. Table 2 is summarizing the results. We notice that R-squared associated to COVID-19 pandemic are far higher compared to the entire sample. This fact suggests that the interest rate pass-through was more visible in the last three years. Moe to the point, all the coefficients associated to policy rate are statistically significant in all the specification. The impact is positive, which leads to the conclusion that 1 pp increase in the policy rate is leading to an increase of the interest rate for all types of products.

**Table 2. Univariate analysis**

| Variables | MLH_MT | MLH_LT | CLH_ST | CLH_MT | CLH_LT | BLF_ST | BLF_MT | BLF_LT |
|---|---|---|---|---|---|---|---|---|
| All sample | | | | | | | | |
| Intercept | -0.0130 | -0.0039 | -0.0020 | 0.0270 | -0.0192 | -0.0096 | -0.0126 | -0.0120 |
| PR (-1) | -0.0014 | -0.0024 | -0.0015 | -0.0120*** | 0.0005 | -0.0096 | -0.0010 | -0.0014 |
| **R-squared** | **0.0001** | **0.0070** | **0.0001** | **0.0349** | **0.0004** | **0.0025** | **0.0005** | **0.0001** |
| COVID-19 pandemic | | | | | | | | |
| Intercept | -0.1802** | -0.1195** | -0.2736*** | -0.1204** | -0.1070** | -0.1173*** | -0.1229*** | -0.1157*** |
| PR (-1) | 0.0592** | 0.0678** | 0.0915*** | 0.0502** | 0.0593*** | 0.0643*** | 0.0673*** | 0.0608*** |
| **R-squared** | **0.1563** | **0.7731** | **0.2574** | **0.2696** | **0.7701** | **0.6416** | **0.6600** | **0.6777** |

*Note: Statistical significance at the 1, 5 and 10 confidence levels is indicated using ***, ** and *.*

In Table 3 we present the estimates resulting from the multivariate analysis. We report significant estimates indicating that interest rate pass-through arises for loans granted to individuals (consumer and mortgage) on long-term (>5years). On short and medium term, we find inconclusive results. Regarding the business loans, we provide statistically significant estimates relating the associated interest rates to policy rate only for short-term banking products. Also, the impact is three times higher compared consumer and mortgage loans. In addition, the dynamic of the interest rates for all three categories follows an autoregressive pattern. Furthermore, the level of CREDITS-to-DEPOSITS matters when commercial banks are setting the interest rates for business loans granted on medium and long term. Interestingly, we report a negative relationship between the previous NPLs dynamic and the current change in the interest rate for products such as consumer and mortgage loans on short and medium term.

**Table 3. Multivariate analysis**

| Variables | MLH_MT | MLH_LT | CLH_ST | CLH_MT | CLH_LT | BLF_ST | BLF_MT | BLF_LT |
|---|---|---|---|---|---|---|---|---|
| Intercept | -0.0211 | -0.0013 | -0.0233 | -0.0205 | -0.0034 | -0.0092 | -0.0080 | -0.0067 |
| Dep.(-1) | -0.1091 | 0.7995*** | -0.1774** | 0.1263* | 0.7257*** | 0.4226*** | 0.4482*** | 0.5176*** |
| CDR(-1) | 0.9760 | 0.1837 | -1.8235 | -0.6884 | 0.0640 | 0.4276 | 0.8904** | 0.8325** |
| NPL(-1) | -0.1009* | -0.0074 | -0.1518** | -0.0554* | -0.0041 | 0.0144 | -0.0180 | -0.0285* |
| CLIFS(-1) | -0.2080 | 0.1529 | -0.6133 | -0.2092 | -0.0011 | 0.1148 | 0.0852 | 0.0592 |
| BCI(-1) | 0.0122 | 0.0002 | 0.0036 | 0.0064 | -0.0003 | 0.0055** | 0.0049** | 0.0033 |
| GOV10Y(-1) | 0.0944 | -0.0014 | -0.0116 | 0.0074 | 0.0025 | 0.0064 | -0.0090 | -0.0103 |
| PR(-1) | 0.0200 | 0.0305* | -0.3781 | 0.0493 | 0.0336* | 0.1041** | 0.0334 | 0.0273 |
| PR(-1)*COVID | 0.1186 | 0.0141 | 0.6027 | -0.0556 | 0.0103 | 0.0722 | 0.0814 | 0.0598 |
| **R-squared** | **0.0573** | **0.6937** | **0.1040** | **0.0618** | **0.5348** | **0.3056** | **0.3254** | **0.3906** |

*Note: Statistical significance at the 1, 5 and 10 confidence levels is indicated using ***, ** and *.*

The conditional quantile regression (Koenker and Bassett, 1978) estimates presented in Table 4 mostly confirm the estimates provided by the OLS approach (rate pass-through arises for loans granted to individuals - consumer and mortgage - on long-term and for businesses for short term. Compared to inferior quantiles (proxied by Q10) – where the interest rate sharply decreases from one month to another across the superior quantiles (high and positive increases for the interest rate – Q90) the pass-through phenomenon is more pronounced. For long-term consumer loans, the coefficient is twice as high across the Q90 compared to Q10 while for short-term business loans, the coefficient three time higher across the Q90 compared to Q10.

**Table 4. Quantile regression estimates**

| Variables | MLH_MT | MLH_LT | CLH_ST | CLH_MT | CLH_LT | BLF_ST | BLF_MT | BLF_LT |
|---|---|---|---|---|---|---|---|---|
| Covariates included | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Q10 | 0.1696 | 0.0414*** | 0.0937 | 0.0426 | 0.0365*** | 0.0902*** | 0.0152 | 0.0754* |
| Q25 | 0.0919 | 0.0022 | -0.0081 | 0.0202 | 0.0089 | 0.0846*** | 0.0595 | 0.0351 |
| Q50 | 0.0386 | 0.0344** | -0.0530 | 0.0033 | 0.0135 | 0.0699** | 0.0928*** | 0.0172 |
| Q75 | 0.0678 | 0.0365*** | -0.0819 | -0.0055 | 0.0122 | 0.1570*** | 0.0576 | 0.0131 |
| Q90 | -0.0252 | 0.0504*** | 0.1539 | -0.0044 | 0.0726*** | 0.2095*** | 0.0884 | -0.0175 |

*Note: Statistical significance at the 1, 5 and 10 confidence levels is indicated using ***, ** and *.*

## 5. CONCLUSIONS

In this paper we study the interest pass-through process during COVID-19 period in Romania. We use both simple ordinary least square (OLS) and quartile regression (QR) to investigate the interest rate pass-through from 2005m01 to 2022m12. As expected, the policy rate changes are positively associated to several banking credit products rates. However, the interest rate pass-through process was not visible during COVID-19 pandemic based on OLS regression. In addition, the QR results revealed that interest rate pass-through is more pronounced across superior quantiles (which are proxied for the shar interest rate increases in 2022) compared to inferior or middle quantiles.

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# THE CONDUCT OF MONETARY POLICY UNDER THE SUPPLY-GENERATED SHOCKS

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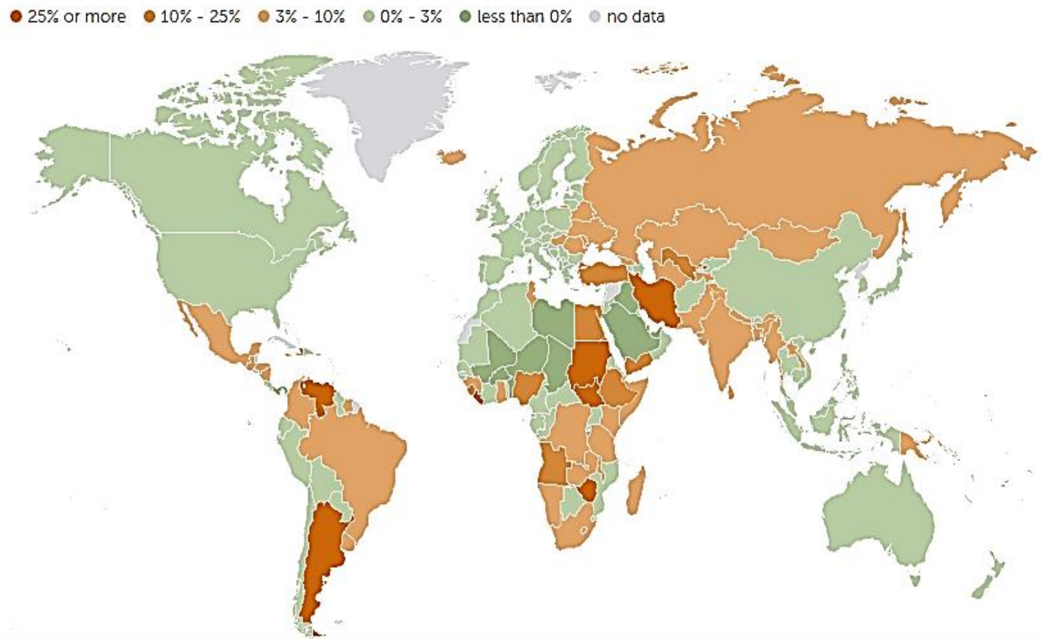
**Abstract**
*In a sequence of supply shocks, central bankers across the European Union and not only, are concerned about the appropriate monetary policy reaction. In the current situation of the volatility of commodity and food prices, central banks are concerned about policy trade-offs, that shall limit to the possible extent the second-round effects and will not undermine the main objective or hinder other policies' implementation.*
*In an inflation-targeting regime, for such shocks, there is more than one policy option. Conventional theory prescribes tightening of monetary policy conditions which is costly to the economy and society, and in most of cases triggers the economy's contraction. Since the last times when economies were hit by such scale shocks, financial markets and economies have become more complex and interconnected, and central banks have evolved by considerably enriching policy frameworks and tools, improving institutional capacity but also supplementing their mandate with secondary objectives, such as financial stability, supporting of general economic policy of the state, greening the economy or reducing inequalities.*
*In the unpreceded character of current supply shocks, policymakers require further research for optimal policy decisions. The paper aims to analyse past and potential policy reactions of the euro area and some of the European Union countries on prolonged supply shocks and draw conclusions about the effects and optimality of taken decisions. The methods of synthesis and analysis were used for fulfilling the purpose of this research paper. The results of research comprise of considerations that could be useful as contributions to policy-making frameworks.*
**Keywords:** *monetary policy; supply shocks; policy reaction; inflation targeting regime.*
**JEL Classification:** E52, F33, E59

## 1. BACKGROUND AND LITERATURE

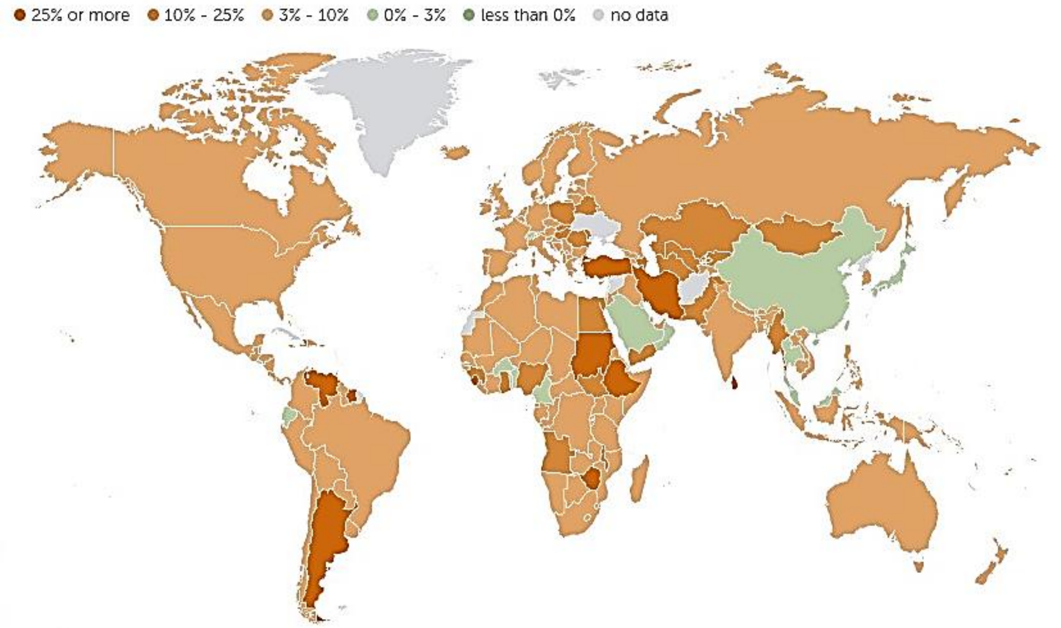
Supply-generated shocks, or supply-side disruptions, can have profound effects on economies, leading to reduced production, increased inflation, and adverse impacts on employment. In the European context, these shocks can exacerbate disparities between member states and impede integration efforts. Therefore, it is crucial to explore possible optimal policy responses, challenges, and define research priorities.

Undeniably globalisation and technological progress contributed significantly to decades low inflation in both advanced and emerging market economies (Weidmann, 2018; Shaktikanta Das, 2022) and this is due to fostered capital redistributing across countries, efficiency, and innovation. But looking at the historic and actual inflation rates data (Figures 1 and 2), it can be observed that since 2020 many economies across different parts of the world face inflationary pressures and for many of them inflation levels reached numbers, which have not been seen for more than two decades. Implicitly, the recent increase in core inflation – that excludes volatile energy and food prices – is a concern. Also, monetary authorities staff project inflation to remain high for longer period (ECB, 2023), delaying the coming back to target quarter after quarter.




Source: constructed by the authors using IMF (2023a)

**Figure 1. Inflation rate, average consumer prices, 2019**




Source: constructed by the authors using IMF (2023a)

**Figure 2. Inflation rate, average consumer prices, 2023**

The recent high inflation originates outside of the financial system caused by large, unforeseen or repetitive supply shocks connected with the global pandemic and geopolitical crisis, which influenced international economic and financial relations. These created volatilities and increase in commodities and food prices and produced economic and financial stress. Simultaneously, other structural changes and the fact that countries run lax fiscal policies to support population and business, have produced additional inflationary pressures, the latter impact was analysed for advanced economies by Banerjee *et al.* (2022). These specific characteristics of factors of inflation is a topic of concern for modern central banks globally from the perspective of optimal policy response, as central bankers are accustomed to deal with the economy stabilisation mainly through the demand channel (Song Shin, 2022).

One cannot but agree with the opinion of economists, who stress that the current situation characterised by a rapid rise in inflation involves difficult policy trade-offs - from the one side, fast policy tightening can drive to financial stress and damage to the economy, but too slow action from the side of CBs could further rise inflationary pressures and require more costly actions in future (Boissay, De Fiore and Kharroubi, 2022). The challenges are associated with the fact that current drivers of inflation are not in control of monetary authorities, but these still have to fulfil their main mandate goal while preserving financial stability and supporting governments growth policies, with possible further extension towards the functions of supporting environmental policies and reducing inequality.

This paper focuses at analysing the causes of inflation and policy responses in the euro area and some of the European Union (EU) countries who reacted on the inflation increase in different points of time. Summarising, the CBs' concerns are presented below (Figure 3).


Source: elaborated by the authors

**Figure 3. Nature and features of actual challenges faced by monetary authorities**

Firstly, in conditions of nominal rigidities and fiscal stimulus, an optimal monetary policy decision is expected to limit economy contraction and be avoiding undesirable second round effects realised in increase of labour cost, profit margins. Although, based on the vision that the stance of monetary policy shall correspond to the economy's performance, theory has clear answers on how inflation caused by supply shocks should be managed, but modern central banks within the limits of their monetary policy frameworks do not yet have a clear solution for optimal policy reaction at an appropriate cost for both the central bank and the economy.

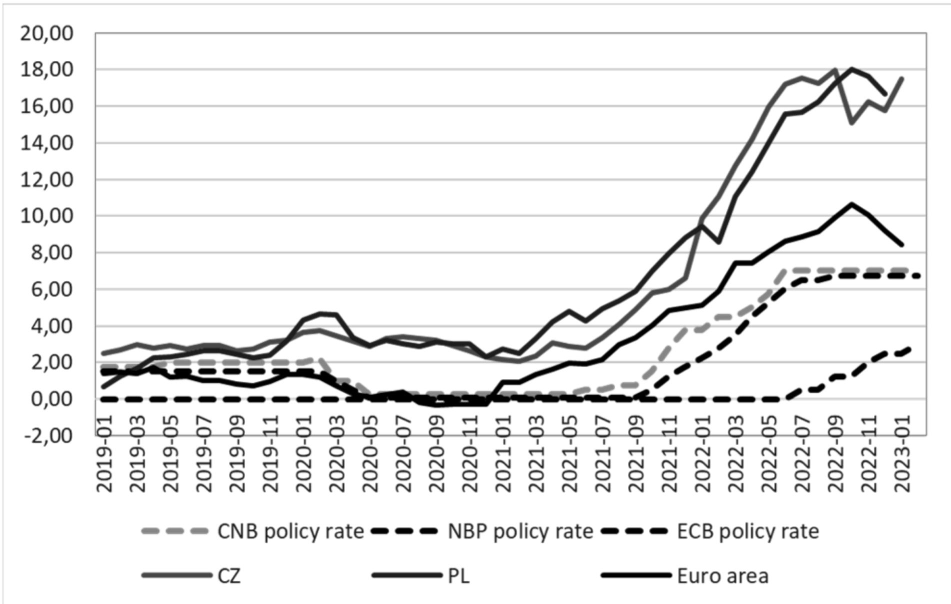
Secondly, although central banks' policy framework tools have evolved significantly in last two decades, seen from the communication of central banks (for instance, ECB 2022b and 2023), it is observed that these acknowledge that current monetary policy frameworks experience limitations in terms of capturing recent shocks and being able to fully understand and foresee their future developments. This particular issue is very important starting with that the policy responses are mainly data-dependent.

In this context, the application of already known monetary policy strategies can lead to severe economy contractions. For this reason, it is proposed to analyse and design one or more monetary policy strategies' considerations, where the fundamental objective of monetary policy is achieved, but there is a room for compromise with other state policies.

## 2. SUPPLY SHOCKS POLICY EFFECTS ON GROWTH IN EUROPE

European member states, including Euro area, register different levels of inflation, respectively the policy rates vary across countries. For the purpose of observation, there were selected the following areas: euro area, Czech Republic and Poland.

While the euro area economy was just recovering from a sequence of supply shocks after the successive waves of the pandemic, it was hit by another major shock originating from the sanctions resulted from a geopolitical crisis in Eastern Europe. Following series of supply disruptions raised energy and commodity prices, which produced significant pressures in core and headline inflation (Figure 4).




*Note: Solid lines depict CPI for a selected area measured as Year-on-year changes, in per cent and dashed lines show policy rate in per cent.*

Source: compiled by the authors based on the data from BIS Statistics Warehouse (2023)

**Figure 4. Consumer price index and Policy rates dynamics for selected areas for 2019-2023, monthly data**

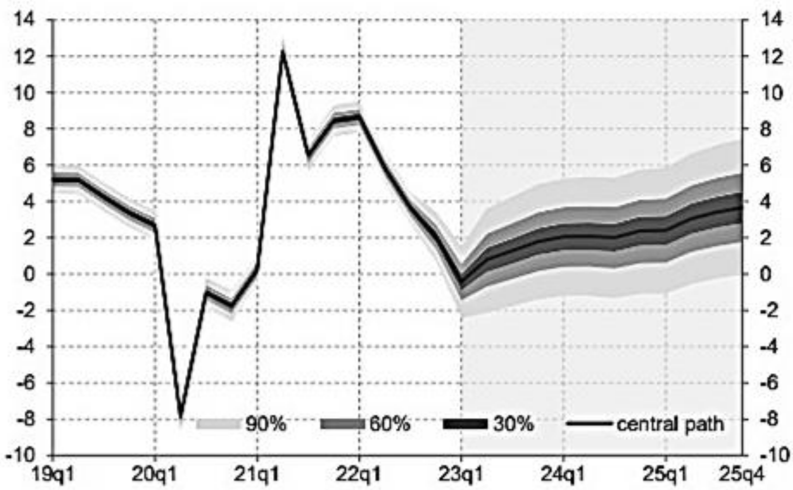
The euro area demonstrated relative economic resilience to the energy crisis, and this is supposedly due to several factors - government support measures, stable employment level, weather conditions during winter making possible saving is heating energy. A recent Federal Reserve Board staff report confirms significant contribution of fiscal stimulus over the inflation level (Di Giovanni *et al.*, 2023). To judge about the extent in which fiscal stimulus influenced disposable income and demand in euro area, it is necessary to conduct a deeper analysis, but there are no doubts that these government actions are pro-inflationary. From the other side, the recovery is slowed down due to tightening monetary conditions both inside and outside the monetary union, negatively impacting the demand.

ECB raised interest for the first time in 11 years in July 2022 (ECB, 2022a). In the last two policy decision rounds (ECB, 2022b and 2023) ECB stresses strong commitment to ensure the return of inflation to their 2% target. The most recent decision was to raise policy rates in the context of persisting inflation and further expectance that inflation will remain “too high for too long”. ECB stresses that their decisions are data driven and will depend on incoming data on inflation, financial data, and strength of monetary policy transmission.

The Czech National Bank (CNB) was one of the first banks to raise the policy rate in response to rising inflation starting in 2021 from 0.5 up to the level of current 7 per cent. In the most recent policy decision CNB (2023) kept the rate unchanged, arguing that interest rates being at a level that is dampening domestic demand pressures and slowing growth in loans to households and firms (IMF, 2023b).

An IMF (2023b) report suggests that, there are differences in opinion about further policy actions. Some opinions give priority to bringing inflation into target of 2% in the CPI, while others consider taken measures to be enough restrictive regarding domestic demand and consider that further tightening could have further weakening effects over economic activity which is currently characterised as recession. To note, that CNB concomitantly runs foreign exchange market interventions to prevent Czech koruna fluctuations, and a fiscal discretionary policy is in place for helping the economy to tackle with high energy prices.

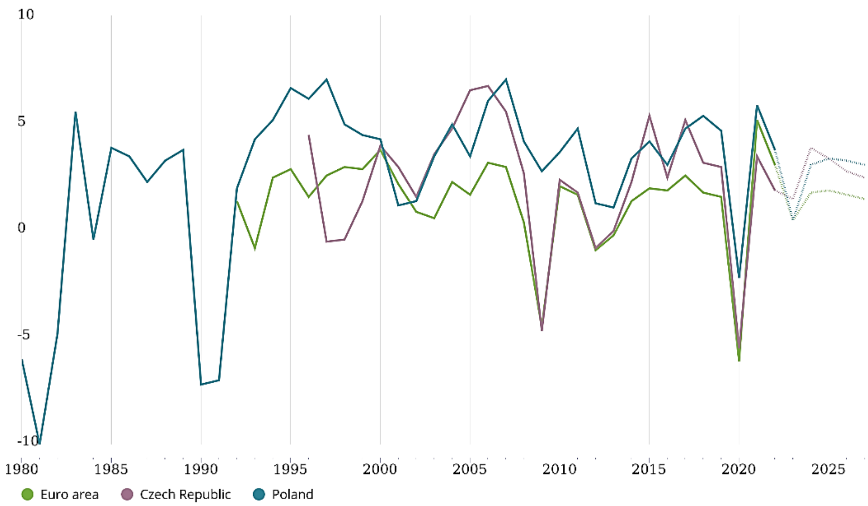
The National Bank of Poland (NBP) began tightening monetary policy in autumn 2021 up to the current all-time high level of 6.75%. Until that time the policy rate stood at the level of 0.1 per cent since May 2020 and until October 2021. The NBP surprised markets with a 40-bps rate increase in October 2021 and then with further increase series, citing the increased risk of second-round effects from higher and persistent commodity prices (IMF, 2022a and 2022b). Annual consumer price growth in Poland declined in the last months of 2022, while remaining at the high level of 16.6% in December 2022 (NBP, 2023). According to the NBP, the fall in inflation in November and December 2022 was primarily due to lower prices of coal and fuels. Poland’s economic activity growth is declining in annual terms, although Gross Domestic Product (GDP) rose by 4.9% in the whole of 2022 (Figure 5).




Source: (NBP, 2023)

**Figure 5. Economic growth projection of the NBP**

Although, overall Europe is showing substantial economic resilience to the structurally high inflation, greater than-expected resilience during the energy crisis could not alleviate recessionary pressures and negative effects on growth (Figure 6).




Source: constructed by the authors using IMF (2022a)

**Figure 6. Real GDP growth, annual percent change**

In the current context monetary authorities across EU stand committed to the inflation target and continue with tightening measures. In her recent speech, the Member of the Executive board of Deutsche Bundesbank, summarises the current structural challenges to the inflations as the “three Ds”: deglobalisation, decarbonisation of the economy, demographics (Mauderer, 2023). All the factors are more likely to exert upward inflationary pressures in coming years. The policy maker calls the Eurosystem to “remain vigilant in this regard and ensure that inflation expectations remain well anchored around 2%”.

## 3. POLICY DISCUSSIONS

Answering the question on how central banks shall deal with the current structural challenges in restoring price stability, there could be recalled the recent speech of the Governor of the Bank of Greece: “The answer is not simple. In dealing with inflation, we are dealing with what the ancient Greeks called the Hydra multi-headed monster” (Stournaras, 2022, p. 2). And this clearly well describes the current situation, as the phenomenon is multifaceted, and there are more tasks to achieve in order to, from the one side, achieve main central banks’ goals, and from the other side, to fulfil other central banks’ functions - the most important to be noticed are the financial stability, preserving the welfare of population’s savings and support government policies with respect to continuous growth and populations prosperity. Moreover, all those tasks should be reached in conditions of uncertainty, non-monetary inflation drivers and unprecedentedly interconnected markets. Tanking decisions by the central banks in complex and uncertain conditions is rightly called by Claudio Borio “the art of central banking” (Borio, 2021, p. 2).

One key policy response to supply-generated shocks is the use of monetary policy tools by central banks. Traditionally, central banks have adjusted interest rates and engaged in open market operations to manage inflation and maintain stability. The conduct of monetary policy under supply shocks can be challenging for central banks. For example, by tightening monetary policy (e.g., raising interest rates) to bring inflation back to its target level, this can result in a decline in output, as higher interest rates can slow down borrowing and investment. On the other hand, if the central bank accommodates the shock, it may allow inflation to rise temporarily, accepting the trade-off between price stability and output stability.

The choice of the appropriate monetary policy response depends on the nature and persistence of the supply shock, as well as the central bank's policy objectives and constraints. How was seen from the analysis, finding optimality in actions is particularly challenging in the conditions of persistence of widely undiversified risks coming from outside of the financial system and structural shocks.

Understanding that for how long the current high inflation persists will determine how much aggregate demand has to be “sacrificed” to bring inflation back to target. In the latest European Central Bank (ECB) press release, in her speech, President Christine Lagarde stressed that there is no trade-off between the financial stability and monetary policy goals, as monetary policy decision is based on financial data as well (Lagarde, 2023). Moreover, banks across EU are well-capitalised and ECB stands ready to address any financial stress with assistance instruments. Hoverer, regardless the financial system soundness indicators, the spillover risks and contagion risks always persist.

Central banks with a clear mandate for price stability, such as the ECB, may prioritize stabilizing inflation, while central banks with a dual mandate, such as the Federal Reserve in the United States, may weigh the trade-offs between inflation and output stability more carefully.

From the previous chapter, it can be observed that banks across EU started to tighten policies at different points of time. European member states, including the euro area, register different levels of inflation, respectively the policy rates vary across countries. ECB raised interest for the first time in 11 years in July 2022 and did so also in the last two policy decision rounds. ECB stresses strong commitment to ensure the return of inflation to 2% target. Comparing to the Czech National Bank, it was one of the first banks to raise the policy rate in response to rising inflation starting in 2021 from 0.5 up to the level of current 7 per cent.

ECB has played a pivotal role in addressing supply-generated shocks in the eurozone, particularly during the COVID-19 pandemic. The ECB's Pandemic Emergency Purchase Programme (PEPP) has provided liquidity to the financial system to avoid depression and support economic recovery, but this also raised concerns about fiscal sustainability and the risk of moral hazard, as it may encourage member states to delay necessary structural reforms.

Policy discussions are around of bringing inflation into target of 2% in the CPI or consider, taken measures to be enough restrictive regarding domestic demand and that further tightening monetary conditions both inside and outside the monetary union, could have further weakening effects over economic activity, which is currently characterised as recessionary.

Certainly, communication plays a crucial role in the conduct of monetary policy under supply shocks. Central banks need to clearly explain their policy actions and their assessment of the economic situation to the public and financial markets, to maintain credibility and anchor inflation expectations.

Although is too early to judge of the efficiency of the approach taken by the central banks to tighten, it can be stated that until now generally EU economies show sign of resilience regardless of presence of recession indicators.

Summarising, from the undergone analysis, it was seen that banks across EU started to tighten policies at different points in time. CNB was ahead of the coming inflation wave, and growth projections experience faster recovery than other analysed areas.

Knowing that monetary policy responds with a lag and depends on strength of monetary transmission, it should be further followed and necessary to conduct further analysis to judge about the cost of such a preventive action.

So far, the conclusions about appropriateness of policy measures and to define monetary policy strategies' considerations there could be mentioned the following:

- It is necessary broaden the perspective of view of the economy. Achieving a "broader picture" could be done perhaps through enriching the current cyclical "lenses" with insights of longer-term trends of macroeconomic indicators;
- Consider the emergence of the new role of policy action and this is to reduce frequency and severity of shocks rather than act reactively in an event of crisis; this will add to the existing efforts to strengthen resilience and may bring it to a new level;
- Recalling a very old but a critical attribute of state - of preserving wealth of population and its value, implicitly population' savings.

Economies vary from many characteristics and factors. A one-fit catch-all policy framework and response does not exist, and it is not necessary. Fostering European integration in the face of supply-generated shocks requires a coordinated and multilateral approach. This includes not only monetary policy measures, but also fiscal policy coordination, structural reforms, and investment in research and development.

The existing policy instruments, when are enriched with a new view and change in focus (as many other goals has been worked during the years), could benefit both advanced and emerging market economies in or outside of the EU.

## 4. CONCLUSIONS

Supply side generated shocks can affect the economy and financial systems in unforeseen ways. These shocks could be triggered by massive events' consequences such as raw materials prices' fluctuation because of pandemics, natural disasters, international conflicts, government policies, or positive processes - such as "green" transition and digitalisation. The monetary policy needs further research to face undiversified impacts on economy and mitigate the extend and negative effects and costs of seemed-unavoidable economic contractions.

The conduct of monetary policy under the supply-generated shocks is an increasingly important topic in the context of promoting economic stability and resilience, in particular, in the face of real supply-generated shocks and fostering European integration. Therefore, in current conditions of persistence of non-monetary driven shocks in modern economies, being subject of globalisation, integration in unions, digitisation, sustainability goals - a reconfiguration of policy reaction framework need to be performed. It requires a coordinated and multifaceted approach, because both the reconfiguration and adaptation, are burdensome processes, implying a deep analysis, but which could lead to identification of best perspectives and development of new, more efficient approaches to tackle the challenges via the monetary policy. Such a research is necessary in order to understand how to adapt policy responses in order to preserve stability and growth, which ultimately affect population welfare and generation development.

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# THE IMPACT OF SMALL AND MEDIUM ENTERPRISES ON ECONOMIC GROWTH: THE CASE OF ROMANIA

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**Abstract**
*The events that have taken place in the last two decades and that have affected the global economy (economic crisis, the COVID-19 pandemic, armed conflicts between countries, natural disasters) have left their mark significantly on both the population and the the business environment. The sector of small and medium enterprises has a particularly important role in the development of the national economy, contributing to the formation of gross domestic product, to the creation of new jobs, thus stimulating competition. That is why small and medium enterprises, considered as the engine of economic growth, play a vital role in creating new jobs, reducing poverty, etc. The objective of this study is to identify the role of small and medium enterprises in the recovery of the Romanian economy, as a result of the events. Considering the fact that the sector of small and medium-sized enterprises is a vital one in an economy, but nevertheless, the pandemic crisis has demonstrated the vulnerability of this sector to uncertain events that affect both the population and the entrepreneurial environment, I believe that this topic is topical and of major interest. The dependent variable of this study is the added value generated by the small and medium enterprises sector and as independent variables we will use the growth rate of the gross domestic product per capita, the national income, the unemployment rate and the youth who do not work and do not follow a form. of education (percentage of total population). The collected data covers the period 2009-2021, the results being obtained with the help of the EViews software. The empirical results of this study demonstrate a significant impact of small and medium enterprises on economic growth. The conclusions of this study are relevant both for company managers and political decision-makers, thus demonstrating the importance of this sector for the country's economy and thus causing them to pay special attention to the problems faced by this sector.*
**Keywords:** *small and medium enterprises; economic growth; sustainable development.*
**JEL Classification:** D92, O4, O11

## 1. INTRODUCTION

The role of small and medium-sized enterprises (SMEs) in the economy is of vital importance, as a result of the fact that 99.8% of all companies are small and medium-sized enterprises, 2 out of 3 employees are employed within them and over 57% of the added value is generated by SMEs in the economy. Thus, the specialized literature (Roman and Onofrei, 2015) presents the crucial role of small and medium-sized enterprises in the European economy.

Small and medium-sized enterprises play a particularly important role in poverty reduction, economic growth and development. That is why, in recent years, economic and social policies have begun to give special importance to this sector. Thus, the creation of new firms leads by providing job opportunities and increasing people's disposable income, which will generate a greater demand for goods and services. That is why SMEs lead to increased living standards and poverty reduction.

The SME sector is characterized by flexibility, but nevertheless, it represents one of the sectors most affected by the crisis caused by the COVID-19 pandemic. The vulnerabilities to which this sector is subject in recent decades, have led both political decision-makers and company managers to adopt a series of measures to improve their situation. The data demonstrated the fact that the biggest problem faced by this sector is the lack of access to financing, an aspect that influences the performance obtained by this sector, a performance that is later found also at the level of the country's economy.

Small and medium-sized enterprises have a particularly important role in fulfilling objective 8 of the 17 objectives of sustainable development, as a result of promoting economic growth and ensuring decent jobs for all people.

## 2. REVIEW OF THE SCIENTIFIC LITERATURE

Small and medium-sized enterprises are considered the engines that lead to economic growth. In the situation where local production is weak, then the power of SMEs represents a key component of local competitiveness, an aspect that also influences the country's economic performance. A number of authors (Maow, 2021) have analyzed how SMEs can contribute to job creation and economic growth. The results of the study demonstrated that the lack of access to financing and a series of government policies represent barriers for the SME sector and therefore ensuring optimal access to financing and the introduction of effective policies for the development of this sector increases the role of SMEs in the economy. The recommendations made by the authors, with the aim of eliminating the economic decline, unemployment and poor security, consist in establishing as many small and medium-sized enterprises as possible and employing mainly young people. Also, research has shown that supporting SMEs can lead to the economic improvement of the country and to the creation of more jobs. Other authors (Memili *et al.*, 2015) based on family business studies and an image based on knowledge of economic growth, analyzed how SMEs influence economic growth. The results of this study demonstrated that economic growth is maximized when there are both familiar and non-familial SMEs in an economy.

Also, as a result of the global financial crisis of 2008-2009, a special emphasis was placed on the role of SMEs in job creation and economic growth. Research has demonstrated over the years that the SME sector has influenced economic growth through entrepreneurship, innovation and the creation of new jobs. Benis (2014) analyzed the relationship between small and medium enterprises and economic growth in Iran, in the period 2004-2005. The results of the study demonstrated a positive and significant relationship between developing SMEs and economic growth, which demonstrates the particularly important role of this sector.

Beck, Demirguc-Kunt and Levine (2003) analyzed the effects of small and medium-sized enterprises on economic growth and poverty reduction in 45 countries. The results of the study demonstrated that there is a strong positive relationship between the development of SMEs and economic growth. Beck, Demirguc-Kunt and Levine (2005) analyzed the relationship between the size of SMEs, economic growth and poverty reduction, concluding that there is no evidence to demonstrate that this sector reduces poverty or income inequality. To analyze the relationship between SMEs and economic growth, the following variables were used: GDP per capita, government spending as a share of GDP, the share of exports and imports as a share of GDP, the inflation rate, the share of credit granted to the private sector, business environment, etc.

According to specialized literature, development and economic growth of a country is associated with the country's national income. Thus, it then proves that an increase in GDP indicates that the country's economy is getting better compared to the previous period. Juminawati *et al*. (2021) analyzed whether small and medium enterprises contribute to the economic growth of the country. The results of the study demonstrated that 90.1% of SMEs have effects on the economic growth rate.

Others (Batrancea, 2022) analyzed the relationship between studies of economic growth, imports and exports regarding small and medium-sized businesses in the European Union. The results of the study demonstrated that exports and imports had a significant impact on economic growth, being represented by the addition. As a result of achieving these results, the authorities must support small and medium-sized enterprises, especially in view of their relevance and contribution to the market.

Vishnupriya and Abirami (2019) analyzed whether SMEs represent the backbone of the Indian economy and whether this sector generates increases in national GDP. Thus, we observe the fact that a growing number of studies analyze the role and importance of small and medium enterprises in economic growth.

## 3. RESEARCH METHODOLOGY

As part of this research, we aimed to analyze the impact of small and medium-sized enterprises on economic growth in Romania. The objective of this research is to empirically evaluate and analyze the effects and the role that this sector has in the economy, especially considering the vulnerabilities to which SMEs throughout the world are subjected in the last two decades.

Thus, the purpose of this research is to determine the impact of SMEs on economic growth in Romania, in the period 2009-2021. The data used in this research comes from the Eurostat database. The dependent variable of this study is the added value generated by the SME sector, expressed as an annual percentage change. Given that small and medium enterprises contribute 57% to the added value in Romania, we chose to measure the performance for this sector through the added variable, thus highlighting the contribution of this sector to Romania's GDP.

The independent variables used are the growth rate of GDP per capita, the national income, the unemployment rate and young people who do not work and do not follow a form of education (percentage of the total population), according to the data presented (e.g. Table 1).

**Table 1. Description of variables**

| Variable description | Variable symbol | Description | Units |
|---|---|---|---|
| ***Added value*** | VA | Added value | % |
| ***Real GDP per capita*** | Real_GDP_Growth | Chain linked volumes, percentage change on previous period, per capita. | % |
| ***Adjusted net national income*** | VN | Adjusted net national income is GNI minus consumption of fixed capital and natural resources depletion. | annual % growth |
| **Unemployment rate - annual data** | Unemp_rate | The labour force is the total number of people employed and unemployed. | % |
| **Young people neither in employment nor in education and training by sex** | People_neither_emp.ed. | The indicator measures the share of the population aged 15 to 29 who is not employed and not involved in education or training. | % of total population |

Source: own data collection according to Eurostat (2023)

## 4. RESULTS AND DISCUSSION

Next we presented the descriptive statistics of the variables included in the study (e.g. Table 2). The calculations were made using the econometric software EViews. The table below presents the descriptive statistics of the analyzed variables and the results demonstrate that the highest standard deviation is registered by the added value variable, which indicates a strong impact of the events of the last years on the SME sector. The most stable indicator is the unemployment rate because it recorded the lowest standard deviation (1.59%). The maximum value is recorded by the variable young people who do not work and who do not follow a form of education, which have a significant impact on the role of SMEs in Romania and on economic growth.

**Table 2. Descriptive statistics of the variables**

| Variable | Min. | Max. | Mean | Median | Std. Dev. | Skewness | Kurtosis | Nr. obs. |
|---|---|---|---|---|---|---|---|---|
| VA | -23.68 | 14.71 | 4.80 | 8.00 | 10.19 | -1.71 | 5.76 | 13 |
| Real_GDP_Growth | -4.70 | 8.80 | 2.68 | 3.70 | 4.17 | -0.53 | 2.17 | 13 |
| VN | -7.44 | 9.93 | 2.65 | 4.56 | 5.41 | -0.66 | 2.23 | 13 |
| Unemp_rate | 4.90 | 9.10 | 7.41 | 8.40 | 1.59 | -0.37 | 1.45 | 13 |
| People_neither_emp. ed. | 17.90 | 25.80 | 22.72 | 24.20 | 2.35 | -0.57 | 2.23 | 13 |

Source: own calculations based on EViews econometric software

The results of the correlation analysis are presented below (e.g. Table 3). It can be observed that the variable GDP per capita has a significant effect on the importance of the SME sector in the process of economic growth. Also, as a result of the value obtained between the variables GDP growth rate per capita and national income, a strong correlation can be observed between them.

**Table 3. Correlation matrix**

| | VA | Real_GDP_Growth | VN | Unemp_rate | People_neither_emp. ed. |
|---|---|---|---|---|---|
| VA | 1.0000 | | | | |
| Real_GDP_Growth | 0.6509* | 1.0000 | | | |
| VN | 0.6394* | 0.8079** | 1.0000 | | |
| Unemp_rate | -0.4904 | -0.4188 | -0.4233 | 1.0000 | |
| People_neither_emp. ed. | 0.2936 | 0.2135 | 0.1923 | 0.5790* | 1.0000 |

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Source: own calculations based on EViews econometric software

In the following table, we presented the results of the regression analysis (e.g. Table 4), and through this table we want to determine the impact of small and medium enterprises on the Romanian economy. According to the data presented in this table, the variables unemployment rate and young people who do not have a job and do not follow a form of education are statistically significant.

**Table 4. Regression results**

| Variable | Coeffcient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -31.0775 | 18.6774 | -1.6639 | 0.1347 |
| Real_GDP_Growth | 0.1366 | 0.7817 | 0.1748 | 0.8656 |
| VN | 0.1167 | 0.5902 | 0.1978 | 0.8481 |
| Unemp_rate | -5.7484** | 1.9809 | -2.9019 | 0.0198 |
| People_neither_emp. ed. | 3.4268** | 1.2330 | 2.7792 | 0.0240 |
| R-squared | 0.7485 | | Adj. R-squared | 0.6228 |
| F-statistic = 5.9538 | | | | |
| Prob (F-statistic) = 0.0159 | | | | |
| Durbin-Watson stat = 2.3667 | | | | |

*indicates that the coefficients are significant at the 5% level

Source: own calculations based on the econometric EViews software

As a result of the results obtained, we can conclude that the unemployment rate and young people who do not work and do not study are the main determining factors that increase the role of SMEs in the Romanian economy.

The gross domestic product per capita is considered to be one of the most important indicators of competitiveness, reflecting economic growth (Popa and Crăciun, 2011). Thus, the growth rate of GDP per capita provides an overview of the evolution of an economy and therefore higher values for this indicator indicate performances of the country's economy.

Taiwo Ayodeji and Yusuf (2012) analyzed the impact of SMEs on economic growth and development. The results showed that SMEs in Nigeria do not contribute much to economic growth, as a result of the barriers this sector faces in accessing sources of finance and hiring qualified personnel.

Demergue-Kunt and Maksimore (2002) concluded that small and medium enterprises include a very important factor for economic development, contributing to the reduction of unemployment which reaches alarming levels as a result of the impact of the events that happened in recent years.

According to the R-squared value, we find that in a proportion of 74.85%, small and medium enterprises influence economic growth in Romania, through the significant contribution they bring to the creation of added value.

## 5. CONCLUSIONS

At the international level, entrepreneurship is known as a determinant of society's prosperity, economic growth and job creation. That's why, in recent years, supporting entrepreneurship has become a priority for every state, as it constitutes a solution for getting out of economic crises and for reducing the unemployment rate.

Sustainable development contributes to the delimitation of economic growth from the negative aspects related to the environment, placing a special emphasis on social aspects. All these aspects imply a sustainable economic growth and contribute to the promotion of decent work.

The results demonstrate the importance and vital role that the small and medium-sized enterprise sector plays in an economy, an aspect also highlighted by events that have affected the economy in recent years. Despite this, it proves that between 80-90% of SMEs are not successful in the first 5-10 years.

According to the results obtained in this study, small and medium-sized enterprises have a significant importance (78.85%) in the economic growth of Romania, contributing to the decrease of unemployment and the employment of the young workforce. Therefore, more attention must be paid to the problems faced by this sector and to the proposal of solutions to fix the problem of access to financing.

In conclusion, the importance of small and medium enterprises is of vital importance for Romania's economic growth.

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# FINANCING STRATEGIES FOR THE JUSTICE SECTOR: OPPORTUNITIES AND CHALLENGES IN THE EUROPEAN CONTEXT

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**Abstract**
*This conference paper explores financing strategies for the justice sector in Europe, focusing on the impact of technology and the COVID-19 pandemic. The paper examines the challenges facing justice sector entities, such as budget cuts and increased demand for services, and discusses how technology can be used to improve financing strategies. Case studies from the Netherlands, Sweden, and Estonia are presented, highlighting successful financing models and their potential for application in the European context. The paper also discusses how justice sector entities have adapted to the financial challenges posed by the pandemic, with a particular emphasis on the importance of technology and international cooperation. The paper concludes by emphasizing the need for innovative financing strategies that prioritize efficiency, effectiveness, and fairness, and that can adapt to the rapidly changing landscape of the justice sector in Europe.*
**Keywords:** *justice sector financing; COVID-19; technology in the justice sector.*
**JEL Classification:** H71, O43, O47, P48

## 1. INTRODUCTION

The COVID-19 pandemic has significantly impacted the financing of the justice sector in Europe (Miller and Blumstein, 2020). With the pandemic leading to a decrease in tax revenues and an increase in government spending on healthcare and economic relief programs, justice sector entities have faced budget cuts and other financial constraints (Skolnik, 2020). These financial challenges have highlighted the need for innovative and effective financing strategies in the justice sector (Muntingh, 2020; EUROJUST, 2022).

Furthermore, even before the pandemic, justice systems worldwide faced financial challenges, with many struggling to meet the increasing demand for justice services while dealing with limited resources (Lysaught and Hazelgrove, 2011; Krieger, 2011). This has increased interest in exploring new financing models and strategies to help justice sector entities operate more efficiently and effectively (Engstrom, 2020).

Therefore, this paper examines the opportunities and challenges in financing the justice sector in the European context, focusing on the impact of the COVID-19 pandemic. The paper will explore case studies of successful financing strategies in Europe and worldwide and identify best practices that can be applied to the European context. Ultimately, the paper aims to provide insights and recommendations for policymakers and justice sector entities on developing and implementing effective financing strategies that can support the delivery of justice services to the public.

## 2. MATERIALS AND METHODS

To explore financing strategies for the justice sector in Europe, this conference paper utilizes a comprehensive review of relevant literature, including academic journals, reports, and government publications. The literature review covers topics such as justice sector financing, the impact of technology on justice services, and the effects of the COVID-19 pandemic on the justice sector's finances. The sources of information are obtained from various online databases, such as JSTOR, Google Scholar, and Scopus, using relevant keywords, including justice financing, COVID-19, and technology in justice services.

The paper also examines case studies from the Netherlands, Sweden, and Estonia to highlight successful financing models and their potential for application in the European context. The case studies were selected based on their relevance and applicability to the European context, their success in financing justice services, and reliable data and information availability.

Additionally, expert opinions and insights from practitioners, policymakers, and academics in the justice sector were consulted to comprehensively analyze the challenges and opportunities facing the justice sector's financing in Europe.

Overall, the paper utilizes a multi-faceted approach, incorporating a literature review, case studies, and expert opinions to comprehensively analyze the financing challenges facing the justice sector in Europe and identify innovative financing strategies that can support the delivery of justice services to the public.

## 3. FINANCING STRATEGIES FOR GOVERNMENT AGENCIES

Government agencies responsible for justice-related activities can secure funding through various methods, including the budgetary process, grants, public-private partnerships, borrowing, and charging fees or fines (ENCJ, 2017). These methods help fund programs, services, and initiatives that promote access to justice, enhance judicial cooperation, and promote the rights of victims of crime (Jackson, 1993).

The *budgetary process* is the most common method of funding government agencies. It involves allocating funds based on the agency's proposed budget and priorities. The Ministry of Justice in England and Wales, the Public Prosecutor's Office in the Netherlands, and the Ministry of Justice in Sweden are all examples of agencies funded through the budgetary process (Sturge, 2019). These agencies must negotiate with the government and advocate for funding for specific programs or initiatives. However, in recent years, budget cuts have affected the staffing levels and services these agencies provide (The Bar Council, 2022; Vera, 2022).

*Grants* are another way for government agencies to secure funding. For example, the European Commission offers grants to support justice-related activities across EU member states through the Justice Programme, which funds projects that enhance access to justice, judicial cooperation, and victims' rights (European Commission, 2023b). Similarly, NESTA provides grants to support innovation in the justice sector (Nesta, 2023), while the Dutch Ministry of Justice and Security provides grants to organizations that offer victim support services (The Government of Netherlands, 2020).

*Public-private partnerships* (PPP) involve partnering with private sector organizations to finance justice-related programs or initiatives. For instance, the UK Ministry of Justice has partnered with Sodexo Justice Services (Foreman-Peck, 2022). In contrast, the Swedish Prison and Probation Service has partnered with G4S to manage several prisons in their respective countries (Nellis and Bungerfeldt, 2013). PPPs allow both parties to work together to achieve common goals related to justice delivery.

Government agencies may also *borrow money* to fund large capital projects, such as building new courthouses or prisons. For example, the UK Ministry of Justice and the Irish Prison Service have issued bonds to finance the construction of new prisons (Irish Prison Service, 2018; Ministry of Justice, 2021). In contrast, the Swedish Prison and Probation Service has taken out loans to finance the construction of new prisons (Boijsen, 2017).

Lastly, government agencies may *charge fees or fines* to individuals or organizations that use their services. The UK Courts and Tribunals Service charges fees for various services, including filing court documents and applying for probate (The Government of the United kingdom, 2023a). These fees are used to offset the cost of providing justice-related services and programs.

In conclusion, government agencies responsible for justice-related activities can use various methods to secure funding to provide the necessary services, programs, and initiatives to promote access to justice, enhance judicial cooperation, and promote victims' rights. However, given the limited resources and competing demands on national budgets, government agencies must explore other funding options, such as grants, public-private partnerships, borrowing, and charging fees or fines.

## 4. FINANCING STRATEGIES FOR LAW ENFORCEMENT AGENCIES

Law enforcement agencies, including police forces and border security agencies, enforce the law and maintain public safety. These agencies typically receive funding from national or local governments, which may be allocated through the budgetary process or grants (Sturge, 2019). In addition, law enforcement agencies may work with government officials to advocate for funding to support specific programs or initiatives.

In the United Kingdom, the Home Office is responsible for providing funding to police forces across the country through the Police Grant Report (Home Office, 2023). This report includes funding for various initiatives, such as counter-terrorism operations, cybersecurity, and tackling serious and organized crime. Similarly, law enforcement agencies in France receive funding from the Ministry of the Interior, including national security, border control, and the fight against terrorism (Cour de comptes, 2019). In Germany, federal and state governments fund various initiatives such as border control and local police departments (Europol, 2023a). Finally, in Italy and Spain, law enforcement agencies receive funding from their respective Ministries of the Interior for public safety, immigration control, and counter-terrorism operations (Europol, 2023b).

Law enforcement agencies may also *charge fees or fines* to individuals or organizations that use their services or violate the law. For example, traffic violation fines may be used to support local police departments or to fund road safety initiatives. In the UK, the police issue fixed penalty notices (FPNs) for various offenses, and the revenue generated from these fines is allocated to police forces to fund local initiatives (Noble Solicitors, 2023). In Germany, traffic violation fines support road safety initiatives and fund local police departments (European Commission, 2021). In France, on-the-spot fines for various offenses are used to fund local police departments and support community policing initiatives (de Maillard and Zagrodzki, 2020). In Italy and Spain, fines for various offenses are also used to fund local police departments and support community policing initiatives (Germain and Poletti, 2007; Nieva-Fenoll, 2020).

*Asset forfeiture* is a financing strategy used by European law enforcement agencies to support their operations and fund community programs. The UK's Proceeds of Crime Act 2002 (Home Office, 2014), the Dutch Asset Forfeiture Act (The Government of Netherlands, 2021), and the Italian Confiscation Law provide a legal framework for asset forfeiture.

Law enforcement agencies may *also partner with private sector organizations* to fund specific initiatives or to gain access to expertise and resources. For example, the "Business Crime Reduction Partnership" in the UK involves collaboration between local police departments and businesses to reduce crime and improve safety in commercial areas (National Business Crime Centre, 2023). In the Netherlands, the police partner with private security companies to provide security for major events, and in Germany, the police have partnered with private companies to implement "SmartCity" projects (Federal Ministry of the Interior and Community, 2021; Protect Cities, 2023).

*Donations and fundraising* can be an effective way for law enforcement agencies to raise additional funds to support their operations or to fund specific programs or initiatives. For example, the UK's Police Dependants' Trust is funded through donations from police officers, police staff, and members of the public (NARPO, 2023). It provides financial assistance to police officers injured on duty or their families if they have been killed. In Germany, the Federal Police Foundation is a non-profit organization that supports the work of the federal police and is funded through donations (Bundeskriminalmt, 2023).

In conclusion, European law enforcement agencies receive funding from national or local governments, charge fees or fines, use asset forfeiture, partner with private sector organizations, and engage in donations and fundraising to support their operations and fund specific programs or initiatives. These financing strategies enable law enforcement agencies to maintain public safety and enforce the law effectively.

## 5. FINANCING STRATEGIES FOR COURTS

Courts are essential to the justice system and are responsible for adjudicating legal disputes and administering justice. In Europe, courts are generally funded by national or local governments. However, in some cases, they may receive funding through grants from government agencies or private organizations to support specific programs or initiatives.

One of the primary sources of funding for European courts is government funding (Langbroek, 2019). In countries like the UK and Germany, national and local governments provide the necessary financial resources for the court system's operation (Sturge, 2019). The federal or state parliament often approves the budget for the court system. Additionally, the European Union provides funding to support justice-related programs and initiatives in member states, including funding for court modernization projects (European Commission, 2023b).

Cost recovery measures such as charging *fees* for filing court cases or accessing court records can also provide courts with additional funding. However, these fees are typically designed to offset the cost of providing services rather than to generate revenue for the court system.

*Fines and forfeitures* are common ways for courts to raise funds in Europe. For example, in the UK, courts can impose fines on individuals found guilty of committing a crime, which can be used to fund the court system or support community programs (The Government of the United Kingdom, 2023b).

European courts may also receive *donations and fundraising* support from various sources, including non-profit organizations, foundations, and individuals (Hemels, 2012). The donations can fund court systems or specific legal aid programs. Public-private partnerships can also be a helpful financing strategy for courts, allowing them to leverage private sector expertise and resources to support their operations. For example, private security firms may partner with courts to provide additional security services. In addition, private law firms or nonprofit organizations may partner with courts to provide legal aid services to individuals who cannot afford an attorney.

In conclusion, funding for European courts comes from various sources, including government funding, cost recovery measures, fines and forfeitures, donations and fundraising support, and public-private partnerships. These funding sources are critical in ensuring the court system's operation and enabling them to provide fair and impartial adjudication of legal disputes and administer justice effectively.

## 6. FINANCING STRATEGIES FOR CORRECTIONAL SERVICES

Correctional services are responsible for managing the incarceration and rehabilitation of offenders, including prisons, probation and parole services, and other related organizations. In Europe, the primary source of financing for correctional services is government funding, which covers staffing, operations, maintenance, healthcare, education services, and rehabilitation programs (Harding, 2018). However, the amount of funding allocated may vary depending on the specific needs and priorities of the government, such as reducing the prison population, which can lead to decreased funding.

Correctional services may also receive funding through *grants* from government agencies or non-profit organizations, which can be used to support specific programs or initiatives to reduce recidivism or improve offenders' rehabilitation outcomes. However, charging fees or fines to individuals under correctional services varies widely across European countries (Wang, 2018). In some countries, inmates are not charged for necessities such as food, clothing, and medical care, while in others, prisoners may be charged for amenities such as TV rental and gym access. Additionally, offenders on community supervision may be required to pay a fee for the cost of their supervision. The use of fees and fines by correctional services in Europe is often controversial. It can disproportionately impact individuals already facing financial hardship and create a barrier to successful reentry and rehabilitation (Tonry, 2012). *Asset forfeiture* is a strategy used by correctional services to fund their operations and community programs, which has been widely used in Europe. Public-private partnerships in correctional services have also been established, such as the Dutch Ministry of Justice partnership with Reclassering Nederland, which provides probation services and support to offenders under the supervision of the Dutch probation service (De Kok, Tigges and Van Kalmthout, 2020).

In addition, correctional services in some European countries use cost recovery measures such as prison labor (Kantorowicz-Reznichenko, 2015). In countries such as the UK, France, and Germany, prisoners must work in various industries, generating revenue to offset the prison system's costs. For example, prisoners work in call centers, textile factories, or construction sites in the UK, generating around £20 million annually (Kinman, Clements and Hart, 2016).

Overall, while government funding remains the primary source of financing for correctional services in Europe, other strategies such as grants, asset forfeiture, public-private partnerships, and cost recovery measures are also employed to support their operations and community programs.

## 7. FINANCING STRATEGIES FOR LEGAL AID ORGANISATIONS

Legal aid organizations in Europe provide critical services to individuals who cannot afford to hire their own lawyers. Government funding, donations, fundraising efforts, and partnerships with law firms and other private sector organizations often support these organizations.

In countries such as the United Kingdom and France, the government provides funding to legal aid organizations to cover a range of legal services, including criminal defense, family law, and immigration (Kelemen, 2011). Legal aid organizations in Europe often rely on donations and fundraising to supplement government funding. For example, the Legal Aid Agency in the UK accepts donations from individuals and organizations, while the Legal Aid Board in Ireland hosts fundraising events to support their work (Legal Aid Board of Ireland, 2021; The Government of Great Britain, 2023). In Belgium, the Bar Councils work with non-profit organizations and charitable foundations to raise funds for legal aid services (Barreau de Bruxelles, 2020).

Legal aid organizations also partner with law firms and individual lawyers to provide *pro bono services, or free legal assistance*, to low-income individuals and families. For example, in the UK, the Bar Pro Bono Unit connects individuals needing legal assistance with volunteer barristers willing to provide free legal services (The Bar Council, 2023). In addition, LawWorks is a charity providing free legal assistance in the UK, and the Ordre des avocats de Paris provides a Pro Bono Commission in France ( Diener, 2016; LawWorks, 2023).

Legal aid organizations may receive grants from various foundations and organizations that support access to justice initiatives. For example, the European Commission and the Council of Europe provide funding for legal aid initiatives through various programs (European Commission, 2023b). In addition, private foundations and organizations, such as the Open Society Foundations and the European Foundation for the Improvement of Living and Working Conditions, also provide grants to legal aid organizations (Open Society Foundations, 2021; European Union, 2023).

Legal aid organizations may use cost recovery measures to offset their expenses, such as the "statutory charge" in the UK, which allows the Legal Aid Agency to recover some or all of the costs of providing legal aid from the individual who has received legal aid if they have won or settled their case and have the means to pay (United Nations Office on Drugs And Crime, 2019). Some legal aid organizations in Europe may also charge fees for certain services, but these fees are typically only used as a last resort.

In conclusion, European legal aid organizations provide critical services to those who cannot afford to hire their lawyers and rely on various funding sources to support their work. These organizations are essential in promoting access to justice and ensuring everyone has equal protection under the law.

## 8. FINANCING STRATEGIES FOR VICTIM SUPPORT SERVICES

Victim support services are organizations that offer assistance and support to victims of crime. These services include counseling, legal advice, and financial assistance. In Europe, many victim support services receive government funding to support their operations. In addition, government agencies or departments may fund victim support organizations or provide grants for specific programs or initiatives.

For example, in the United Kingdom, the Ministry of Justice funds the Victim Support charity to provide support services to victims of crime (The Ministry of Justice, 2022). In France, the government funds a national federation of victim support associations, France Victimes, through grants from the Ministry of Justice and regional and local governments (France Victimes, 2023).

Victim support services also rely on *donations from individuals and organizations* to fund their operations and specific programs. For instance, Victim Support Europe, an umbrella organization for victim support services across Europe, hosts fundraising events and campaigns such as their annual European Day for Victims of Crime to encourage people to donate (Victim Support Europe, 2023). In Scotland, Victim Support Scotland relies on donations from individuals and organizations to fund their services and organizes an annual charity ball to raise funds (Victim Support Scotland, 2023).

Victim support services may also receive grants from foundations and other organizations that support programs and services for victims of crime. The European Union Victims' Rights Directive has established a funding program to support victim support services in member countries (European Commission, 2023d). The Vodafone Foundation provides funding to victim support organizations in Europe (Vodafone, 2019), and the Victim Support Europe Foundation provides grants to victim support organizations throughout Europe (Victim Support Europe, 2023). Other foundations, such as the Barrow Cadbury Trust and Calouste Gulbenkian Foundation, fund victim support organizations (Calouste Gulbenkian Foundation, 2017; Barrow Cadbury Trust, 2023).

In some European countries, victim support services may receive funding through *asset forfeiture* programs, which allow law enforcement agencies to seize assets believed to be connected to criminal activity. The proceeds from the sale of these assets may then be distributed to victim support organizations.

*Cost recovery* is not a common financing strategy for European victim support services. Generally, these services aim to provide assistance and support to victims of crime, regardless of their ability to pay. However, in some cases, victim support services may seek reimbursement from insurance companies or the offender for specific services such as medical expenses or property damage. For example, in the United Kingdom, the Criminal Injuries Compensation Authority provides financial compensation to victims of violent crime (Criminal Injuries Compensation Authority, 2023). It may seek reimbursement from the offender if convicted and ordered to pay compensation.

In conclusion, victim support services in Europe receive funding from various sources, including government agencies, donations from individuals and organizations, grants from foundations, asset forfeiture programs, and cost recovery. These funding sources help victim support services provide vital assistance and support to victims of crime in need.

## 9. FINANCING STRATEGIES FOR NON-GOVERNMENTAL ORGANIZATIONS

Non-governmental organizations (NGOs) in Europe are crucial in advocating for justice-related issues such as human rights, poverty alleviation, disaster relief, and sustainability. NGOs often rely on donations, fundraising, and income-generating activities to fund their operations and programs.

To raise funds, NGOs organize charity events, launch crowdfunding campaigns, accept online donations, partner with corporations, and receive grants and donations from foundations and charitable trusts. For instance, Oxfam hosts the Trailwalker event, and Doctors Without Borders launched a crowdfunding campaign for its work in Yemen (Oxfam Trailwalker, 2023; Doctors without Borders, 2023). NGOs also rely on membership fees as a common financing strategy, with organizations such as Amnesty International and Transparency International relying on the support of their members to fund their work (Amnesty International, 2023; Transparency International, 2023).

Corporate social responsibility (CSR) is becoming increasingly popular for NGOs to receive corporate financial support. Companies recognize the importance of social and environmental responsibility and seek to partner with NGOs to support their causes. The Body Shop, IKEA Foundation, Unilever Foundation, and Deutsche Bank are examples of companies partnering with NGOs to support environmental and social causes (The Body Shop, 2023; IKEA Foundation, 2023; Unilever, 2023; Deutsche Bank, 2023) .

NGOs may also receive funding from national or local governments, which may be allocated through grants or the budgetary process. Amnesty International, European Council on Foreign Relations, Open Society Foundations, Transparency International, and WWF are examples of organizations that receive government funding to support their activities (European Council on Foreign Relations, 2023; World Wildlife Fund, 2023).

Moreover, European NGOs engage in *income-generating activities* such as publishing and selling reports and studies, offering training and consulting services, organizing events and conferences, providing certification and accreditation services, and selling merchandise. These activities enable NGOs to diversify their funding sources and generate revenue to support their operations.

In conclusion, European NGOs rely on various funding sources, including donations, fundraising, membership fees, CSR partnerships, government funding, and income-generating activities. These funding sources enable NGOs to continue their essential work in advocating for justice-related issues and promoting social and environmental causes.

## 10. ADDRESSING FUNDING GAPS AND IMPROVING ACCOUNTABILITY IN THE EUROPEAN JUSTICE SECTOR

The European regulatory framework addresses financing issues related to the justice sector through various mechanisms, including EU funding programs, national budgets, and partnerships between public and private entities. However, despite these mechanisms, gaps, and areas for improvement still need to be addressed through changes to existing regulations or the introduction of new ones.

Legal aid is essential for ensuring access to justice for all citizens, particularly those who cannot afford legal representation. While some European countries have well-established legal aid systems, others face significant challenges in providing legal aid services. The European regulatory framework addresses financing issues related to legal aid services through various mechanisms, including the European Social Fund (ESF) (European Commission, 2023a). However, there still needs to be a significant gap in funding for legal aid services across Europe, particularly in countries with weaker legal aid systems.

To address this gap, the EU could consider creating a specific funding program for legal aid services or increasing funding for existing programs, such as the ESF. The EU could also establish minimum standards for legal aid services across member states and explore ways to promote greater collaboration between legal aid providers and other justice sector actors.

Financing victim support services is another area for improvement in Europe. While the EU and national governments provide funding for these services, there are still gaps in financing that limit the availability and quality of victim support services. To address this issue, the EU could increase funding for existing programs, such as the European Instrument for Democracy and Human Rights (EIDHR), or establish a funding program that specifically supports organizations working on legal aid, victim support, and access to justice (Dobreva, 2020).

Transparency and accountability are crucial for ensuring that funds allocated to the justice sector are used effectively and efficiently. While there are already regulations to promote transparency and accountability, such as the EU Financial Regulation, there is still room for improvement. For example, the EU could introduce regulations to increase transparency in public procurement processes, require regular reporting and audits of funding recipients, and establish independent oversight bodies to monitor the use of funds. The EU could also introduce regulations to require the publication of information about the financing of the justice sector, such as budgets and spending reports.

In conclusion, the European regulatory framework addresses financing issues related to the justice sector through various mechanisms. However, gaps and areas for improvement still need to be addressed through changes to existing regulations or the introduction of new ones, such as increased funding for legal aid and victim support services, improved transparency and accountability, and investment in technology and innovation.

## 11. ENHANCING THE EFFICIENCY AND EFFECTIVENESS OF THE JUSTICE SECTOR IN EUROPE THROUGH TECHNOLOGY AND INNOVATION

In Europe, investment in technology and innovation can significantly enhance the efficiency and effectiveness of the justice sector. One example is the e-CODEX project, which enables secure communication between judicial authorities in different EU member states, thus reducing the time and costs of cross-border litigation (e-CODEX, 2023). In addition, online dispute resolution (ODR) systems (European Commission, 2023c), electronic case management tools, and blockchain technology can improve access to justice, increase transparency, and reduce administrative costs. Machine learning algorithms can also identify potential fraud or mismanagement of funds, thereby increasing accountability in the financing strategies of justice sector entities (Berk, Berk and Drougas, 2019).

In Estonia, blockchain technology has been used to store legal documents and ensure their authenticity (e-Estonia, 2023b). At the same time, the Dutch Blockchain Coalition's pilot project aims to create a shared digital infrastructure for the justice system, facilitating seamless information sharing and collaboration between different agencies (Dutch Blockchain Coalition, 2023). The EU's BLOCKCHAIN for the Justice Sector project is testing the use of blockchain for several justice-related applications, including cross-border legal cooperation and evidence sharing (Dimitropoulos, 2022). The Spanish government's platform for public procurement, CPI, uses machine learning to detect and prevent fraud in public procurement (García Rodríguez *et al.*, 2020).

Online fundraising platforms have been used in the UK and Germany to raise funds for access to justice initiatives. For example, the Access to Justice Foundation and Betterplace.org offer dedicated platforms for individuals and organizations to donate to specific projects and receive regular updates on their impact (The Access to Justice Foundation, 2023; Betterplace, 2023).

In conclusion, investment in technology and innovation is critical for improving the efficiency and effectiveness of the justice sector in Europe. Using blockchain, machine learning, and online fundraising platforms can increase transparency, reduce administrative costs, and improve access to justice, thereby enhancing the public's trust in the justice system.

## 12. ADAPTING FINANCING STRATEGIES FOR THE JUSTICE SECTOR IN EUROPE DURING THE COVID-19 PANDEMIC

The COVID-19 pandemic has significantly impacted financing strategies for the justice sector in Europe (Wieland, 2022). The pandemic has created significant financial challenges for justice sector entities, as they have had to adjust to new ways of working while also dealing with budgetary constraints (Bošković and Nenadić, 2021; Teremetskyi *et al.*, 2021).

One of the key ways that justice sector entities have adapted to the financial challenges posed by the pandemic is by embracing technology. Many courts and other justice sector entities have moved to online systems for hearings and other processes, allowing them to continue operating while adhering to social distancing guidelines (Karski and Oręziak, 2021; Sanders, 2021). This has required significant investment in technology infrastructure and staff training, but it has also allowed justice sector entities to maintain their services and continue to provide access to justice.

Another way that justice sector entities have adapted is by prioritizing their activities and focusing on the most critical areas. With limited resources available due to budget cuts and other financial constraints, justice sector entities have had to decide where to allocate their resources (Bowcott, 2020). This has required a greater focus on efficiency and effectiveness and greater collaboration between different entities to ensure that resources are being used in the most effective way possible.

Finally, the pandemic has also highlighted the importance of international cooperation and coordination in addressing the justice sector's financial challenges (Hershkoff and Miller, 2020). The pandemic has affected countries worldwide, and justice sector entities in different countries have had to work together to share knowledge and resources and find solutions to common challenges. This has required greater communication and collaboration between justice sector entities and coordination between national governments and international organizations such as the European Union.

## 13. EXAMINING SUCCESSFUL FINANCING STRATEGIES IN THE EUROPEAN JUSTICE SECTOR

The justice sector is an important pillar of any society, and efficient financing strategies are essential to ensure its smooth functioning. In this chapter, we examine three successful financing strategies implemented in the justice sector in Europe.

The Netherlands adopted a "punishment for profit" model in 2006, allowing private companies to operate four of the country's 29 prisons (Wassenaar, Gradus and Molleman, 2015). The private companies were paid a fixed rate per prisoner daily, incentivizing them to keep the prisons at total capacity. This approach reduced costs, costing private prisons about 10% less than their public counterparts.

Furthermore, private prisons had lower rates of staff absenteeism and inmate violence (Byrne, Kras and Marmolejo, 2019). However, critics argue that the focus on profitability may compromise the quality of rehabilitation and education programs, which are crucial for reducing recidivism rates ((Wassenaar, Gradus and Molleman, 2015).

Sweden's progressive financing strategy for fines is based on the principle of proportionality, with fines calculated based on a person's daily income (Oberg, 2021). This approach ensures that fines are fair and proportionate and encourages compliance (Kantorowicz-Reznichenko and Kerk, 2020). Additionally, the system reduces administrative costs, making it easier to enforce proportionate fines based on a person's ability to pay.

Estonia's e-justice system is one of the most advanced in the world, providing online access to legal information, case management tools, and dispute resolution services (e-Estonia, 2023a). This system has reduced administrative costs and increased efficiency in the justice sector while improving access to justice for those in remote areas or with limited mobility (Numa, 2022). The Estonian e-justice system has been replicated in other countries and inspired similar initiatives worldwide (Lupo and Bailey, 2014).

These three financing strategies offer different approaches to addressing the challenges the justice sector faces. The Dutch model demonstrates how private sector involvement can reduce costs and improve efficiency but also highlights the potential risks and challenges associated with this approach. The Swedish model shows the importance of considering the impact of financial penalties on individuals and implementing policies that promote fairness and proportionality. Finally, the Estonian model exemplifies how technology can be utilized to improve financing strategies and increase efficiency in the justice sector.

In conclusion, the successful financing strategies in the justice sector in Europe demonstrate the importance of innovation and creativity in addressing the challenges faced by this critical sector. By implementing effective financing strategies, we can ensure that justice is accessible, efficient, and fair for all citizens. Furthermore, these strategies can serve as a roadmap for other countries facing similar challenges and inspire new approaches to financing the justice sector worldwide.

## 14. CONCLUSIONS

Financing the justice sector is a complex and multifaceted challenge that requires innovative solutions and a collaborative approach. The COVID-19 pandemic has highlighted the importance of technology and international cooperation in addressing the justice sector's financial challenges. Examples of successful financing strategies in Europe and around the world offer valuable lessons and best practices that can be applied to the European context. The cases of the Netherlands, Sweden, and Estonia demonstrate the potential of private sector involvement, progressive financing strategies, and technology to improve the efficiency, fairness, and access to justice. As the justice sector faces financial challenges, policymakers, practitioners, and stakeholders must remain committed to exploring new and effective financing strategies to ensure justice delivery to all.

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# STRATEGIC ELEMENTS OF DIVERSITY MANAGEMENT IN THE EDUCATIONAL SYSTEM – CASE STUDY: CLIM

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**Abstract**
*CLIM is the acronym for Cooperative Learning in Multicultural Groups, and proposes a certain organisation and structure of the teaching contents, regardless of the subject taught, based on the pedagogical principle of creative – cooperative learning (CCL). Besides its proper pedagogical purpose, this approach can be also considered a strategic element of diversity management in a school, whenever in the classroom or the teachers' room one can meet different cultures, ethnics, native languages, political views or religions.*
*Using this method when teaching different subjects, mainly the counseling and orientation class, all the abilities of a person can be enhanced and involved, such as oral production skills (in a foreign language class), written production skills (reading, listening, spelling and literacy) and there will be build complex competences, integrating values and positive attitudes – cognitive flexibility, communication skills during teamwork, tolerance towards differences, critical approach to cultural stereotypes, raising interest in discovering socio-cultural and professional life-related aspects.*
*Regarding CLIM as a strategic element of the management of diversity in terms of adults involved in education (in a school), the hereby study created the premises for the analysis of efficacy of this method – does it really enhance group cohesion and an inclusive atmosphere, where all the participants feel themselves and appreciated for what they are?*
**Keywords:** *school diversity; diversity management strategy; education.*
**JEL Classification:** I2

## 1. INTRODUCTION

CLIM is the acronym for *Cooperative Learning in Multicultural Groups*, and proposes a certain organisation and structure of the teaching contents, regardless of the subject taught, based on the pedagogical principle of creative – cooperative learning (CCL). Besides its proper instructional purpose, this approach can also be considered a strategic element of diversity management in a school, whenever in the classroom or the teachers' room one can meet different cultures, ethnics, native languages, political views or religions.

Using this method when teaching different subjects, all the abilities of a person can be enhanced and involved, such as oral production skills (in a foreign language class), written production skills (reading, listening, spelling and literacy) and complex competences will be build, integrating values and positive attitudes – cognitive flexibility, communication skills during teamwork, tolerance towards differences, critical approach to cultural stereotypes, raising interest in discovering socio-cultural and professional life-related aspects.

Regarding CLIM as a strategic element of the management of diversity in terms of adults involved in education (in a school), using this method represents an opportunity for managers to organize debates on internal policy applied to schools, to create working tools - documents within different school boards and work teams.

Thus, the hereby study created the premises for the analysis of efficacy of this method – does it really enhance group cohesion and an inclusive atmosphere, where all the participants feel themselves and appreciated for what they are?

## 2. LITERATURE REVIEW

The CLIM method was first used in Belgium, in primary schools, in 1995, aiming at a response to the needs for intercultural educational in the form of partnerships within heterogeneous groups, combining the didactical process based on the principle ”all together in the same class” with the one where the academic content is presented through direct interaction among students. (Pétursdóttir, 2018) Pursuing this principle, this method is part of a socio-constructivist approach, the interaction factor being a key element of the learning process. The participation of all students in a class in group work is a necessary condition for ensuring equal access to the 21st century competences. In other words, working together in small heterogeneous groups in order to solve a task achieves the purpose of higher self-esteem, mutual respect and degree of inclusion, by developing true interpersonal relationships. (Ichim, 2021). Research (Cohen and Lotan, 1995; Craig, 2015; McManus, 2001) has shown that we learn more and better when explain the information to others than when we only listen or present. Group work creates the context for better learning, but does not guarantee the effective participation of each student. Cohen and Lotan (1997) states that cooperative learning is the most efficient approach of heterogeneous classrooms. According to Pétursdóttir (2018, p. 35), there are more than 280 studies on the impact of cooperative interaction and social support on the quality of relationships, showing that intercultural education can thus be achieved. Paelman (2001) presents the status given to the student as a factor of success when using CLIM.

According to Petursdottir (2018), there can be identified the following phases (stages):

1. The introductory task: the teacher's objectives are to define the concepts/ notions to be taught and learned, to form the groups, to assign the roles, to explain each intervention of the students involved and the possible role exchanges or group reconstructions, and finally, to offer the details of the task to be fulfilled.

2. Expressing students' impressions on the concepts/ notions to be acquired – this task may be parted into two stages: (a) the student's free individual expression based on a support (word list, drawing, diagram, sketch, Q-sort, picture-based-lecture) then, consequently (b) the exchange within each group of students of the different impressions, followed by a confrontation or debate. This task is aimed at developing an initial level of reflexion regarding the concepts/ notions to be dealt with and at stimulating the intrinsic motivation.

3. Individual, independent reading of the resources given by the teacher/ activity coordinator, each of these resources giving a different perspective on the concept/ notion. Therefore, the coordinator should plan for at least four files of resources (based on the number of students per group) which are to enhance certain abilities, thinking processes, practical abilities related to the concept/ notion to be acquired.

4. Cross analysis among the students who have had the same resources. This task should increase the comprehension degree, the level of accessibility of the problem to be discussed and the cooperation abilities.

5. Going back to the group - or creating new groups in order to insure that all the resources are present in each group – and sharing tha key elements of each of the documents.

6. Solving a problem-situation which mobilises the knowledge and the abilities previously acquired, but also personal, experience-based information and values which constitute the involvement of the diversity traits in this particular methodological approach. Each problem-situation is different in each group.

7. Plenary presentation of the conclusions and solutions – the teacher/ coordinator can motivate students to present the information/ data in an original manner, such as role-play, drama, video, experiment.

8. A general conclusion – the coordinator revises the key points to be remembered regarding the theme or the concept, answers the questions which might occur, underlines the difficulties the parties have met, and formulates feed-back regarding the behaviour of the participants, their cooperation (what was appropriate and worked and what did not). Rarely does the teacher/ coordinator need to intervene during the stages 2 through 7; sometimes, there are questions or a necessary revision of the calendar, if some more or less time is to be allowed.

Within each group, each student is given a certain role and specific tasks; these roles permit the group to work independently from other groups or the teacher; the tasks and the roles are customized to the personal abilities of the students, so that they are not placed in a failing position (Ichim, 2020). Consequently, it is compulsory that a role is not repeatedly given to the same student when the method is used systematically by a teacher. According to Cohen (2014), it is important that each participant try a new, different role, the most frequently proposed being: (a) the facilitator (the person to animate the group and conduct the fulfillment of the tasks given by the coordinator), (b) the presenter (responsible for the drafting of the information and plenary reporting), (c) the material/ resources manager, (d) the synchronizer (timekeeper, referee and harmoniser); a fifth role could be obtained by dividing one of the statutory roles, such as the synchronizer (timekeeper, referee) and the harmoniser (to observe the others, cheer up and help whenever necessary.

## 3. METHODOLOGY

3.1. **The aim** of the study is to measure at low scale the use of CLIM as a strategic element of the management of diversity in terms of young adults involved in education (in a school), in terms of diverse group cohesion , mutual respect, and an inclusive atmosphere, where all the participants feel themselves and appreciated for what they are.

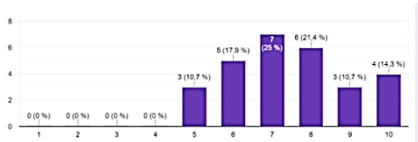
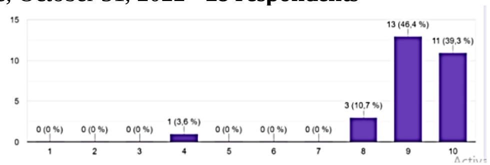
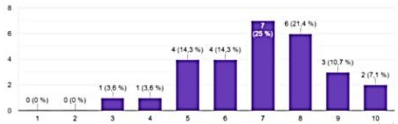
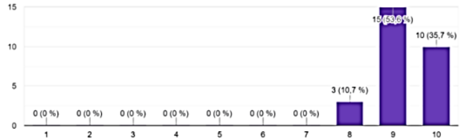
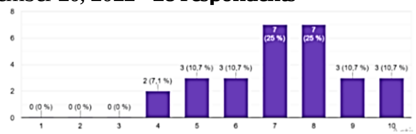
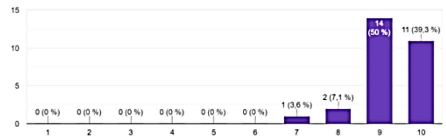
3.2. **The objectives** are: (a) to measure the initial level of inclusion, cohesion and mutual respect; (b) to use exclusively the CLIM method during a month of teaching for the experimental group (group A), and (c) to measure the level of the same three social values given by both groups at the end of the study (named in the hereby study *final level)*.

3.3. **The method** used was the inquiry through questioning, the instrument was the questionnaire (Annex 1 – questionnaire). The answers were gathered through the means offered by Google forms and the quantitative analysis was realised using the Eviews program.

3.4. **The study was devised as following:** Two high-school nineth grade-classes of students got involved in the study, 56 students altogether, grouped in two 28 student-groups, A and B; they all answered the same set of initial questions **-** a questionnaire with 3 questions/statements, in order to identify what the level of inclusion, cohesion and mutual respect was in each group. After one month of participation in the author's experimental classes (Annex 2 – model of EFL lesson) – 3 times a week, 12 sessions, during which group A were pedagogically approached exclusivley using CLIM, and group B exclusively classically (although group work was used to solve tasks), both group of students answered the same set of questions in order to measure the final values and, thus, revealling the pursued results.

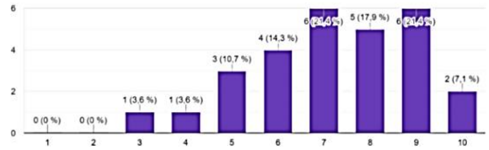
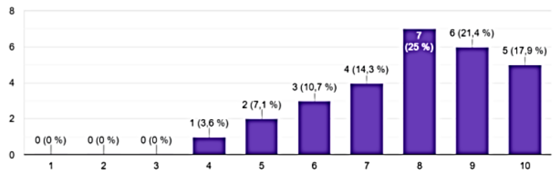
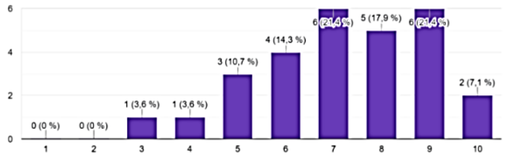
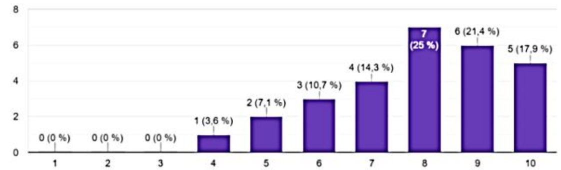
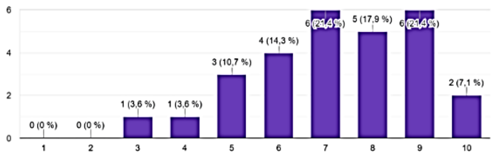
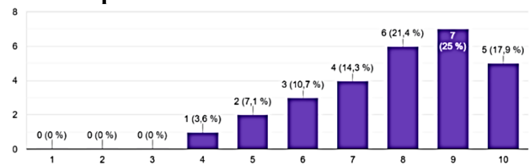
3.5. **Data analysis -** for group A, the final score was that 28 out of 28 students increased with at least 1 point, which represents a 100 % efficacy of the CLIM approache, compared to the score given by group B which only improved for 10 and, respectively, 11 students out of 28, which represents a 35.71 % and, respectively 39,28 % efficacy of the classic pedagogical methods (including group work) when aiming at the three concepts: group cohesion, inclusion and mutual respect.

**Table 1. Final results Group A**

| Aim of the questionnaire | Results of the initial questionnaire - Group A | Results of the final questionnaire - Group A | Analysis |
|---|---|---|---|
| **1. Mutual respect** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***mutual respect*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***mutual respect*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **100% improved appreciation:** 28 out of 28 respondents changed their answers into a better value |
| **2. Cohesion in the classroom** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***class cohesion*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***class cohesion*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **100%** improved appreciation: 28 out of 28 respondents changed their answers into a better value |
| **3. Inclusion in the classroom** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***inclusion*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***inclusion*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **100%** improved appreciation: 28 out of 28 respondents changed their answers into a better value |

Source: author's contribution

**Table 2. Final results Group B**

| Aim of the questionnaire | Initial questionnaire Group B | Final questionnaire Group B | Analysis |
| --- | --- | --- | --- |
| **1. Mutual respect** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***mutual respect*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***mutual respect*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **39.28 % improved appreciation**: 11 out of 28 respondents changed their answer into a better value |
| **2. Cohesion in the classroom** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***class cohesion*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***class cohesion*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **35.71 % improved appreciation**: 10 out of 28 respondents changed their answer into a better value |
| **3.Inclusion in the classroom** | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***inclusion*** in your class, on the current date, September 20, 2022 - **28 respondents**  | On a scale from 1 to 10, where 1 is the minimum value and 10 is the maximum value, how do you appreciate the degree of ***inclusion*** in your class, on the current date, October 31, 2022 - **28 respondents**  | **35.71 % improved appreciation**: 10 out of 28 respondents changed their answer into a better value |

Source: author's contribution

## 4. RESULTS AND DISCUSSIONS

The results could be based, though, on more factors, external to the study, as students underwent the approach only during their English classes, and were exposed to different other interventions from other teachers, including their council - teacher, whose impact has not been measured.

The CLIM method has not been used in this study for larger group management, such as teachers in a school, which will constitute the next step for the study, to be undergone in the future.

The coordinator/ teacher must be vigilant regarding the group componence, reaching the highest level of heterogeneity possible and offering each participant the possibility to experiment each role, allowing the groups to be independent from the leadership and control of the teacher.

The pedagogical principle at the core of the CLIM activities combines the intellectual challenge with student-centred tasks in order to teach – learn – acquire a specific, often scientific concept. The diverse tasks are to allow the mobilisation of the personal abilities, competences and views of each participating student. The main criterion for the role choice is Howard Gardner's theory of multiple intelligences. Although it might be obvious that the linguistic abilities are primarily underlined, it is equally important to involve and practice other abilities, such as logic, artistic expression or body language (see the TPR (Total Physical Response) method.

All these constituents require a high level of organisation, so that each participant, each role and each group, according to the personal information of the students. At the same time, the idea of competition among the groups involved in a CLIM project may not be excluded from the students' motivation sector, although the main concern should be not to create the same group with students exercising the same roles, so that the competition does not turn personal.

## 5. CONCLUSION

The results of the study show that, if consistently applied within a specific, heterogeneous, diverse group, the CLIM approach can improve the degree of cohesion, inclusion and mutual respect of the members of among the members of the group.

Consequently, in terms of diversity management, it is expected to produce a diminishing in the possible conflicts issued by cultural or ethnic differences, enhance the advantages of being different and accepting that each and every person is no but a treasure to be discovered.

**ACKNOWLEDGEMENTS**

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# POST-WAR RECOVERY AND DEVELOPMENT OF THE REGIONS: EUROPEAN EXPERIENCE FOR UKRAINE

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**Abstract**
*This article examines the post-war recovery of the regions of Ukraine. Unfortunately, hostilities on the territory of Ukraine more ongoing, final consequences and dimensions losses not yet counted. That's why the question post-war restoration regions of Ukraine is relevant at the moment and will be relevant for a long time Recovery is already underway de-occupied regions and is planned recovery in the future de-occupied regions. For Ukraine special the interest is European experience post-war restoration countries, because from this further recovery and development of each region depends and state in general Considered question activity advisory body under the President of Ukraine - the National Council for the Recovery of Ukraine from the Consequences of WWII. The question of financing the restoration process was considered. The question of the functioning of funds for the recovery of Ukraine, which were created by the Government, was analyzed. The post-war recovery experience of European countries: Georgia, France, and the Balkan countries is analyzed. The provisions of the Marshall Plan are considered. Recommendations were provided on the development of the Plan of measures for the post-war reconstruction and development of Ukraine. Recommendations have been made regarding additions to the Regulations on the National Council for the Recovery of Ukraine from the Consequences of the War.*
**Keywords:** *regions; post-war recovery and development; European experience; Marshall Plan*
**JEL Classification:** O018, O190, O520

## 1. INTRODUCTION

On February 24, 2022, martial law was introduced in Ukraine. Unfortunately, at the moment combat actions continue, and therefore martial law continues to operate. Fighting actions inflicted Ukraine huge losses. One of primary and basic measures authorities is post-war restoration of Ukraine. All spheres life activities in need recovery, including and the sphere of the regional development of Ukraine. Unfortunately, as well any country the world after war, Ukraine will not have enough resources for recovery. For post- war restoration necessarily needed help foreign partners. Such help will contribute fast recovery economy, because without it there can be no political stability, no peace. Such help should be systematic

## 2. PRESENTATION OF THE MAIN MATERIAL

Despite the continuation of martial law and hostilities, experts urge planning now restoration of Ukraine. In this connection, the regions need a new reconstruction plan that responds modern and real conditions. That's why now is special interest for Ukraine is European experience restoration regions after war because from this further recovery and development of each region depends the whole of Ukraine. The post-war recovery of Ukraine is one of the primary and main measures of the authorities.

The process of rebuilding Ukraine after the war should take place in several stages.

The first stage is political. It is necessary to take all possible measures to avoid the renewal of the military conflict and other similar conflicts in the future, it is necessary to prevent the enemy's aggression and the development of a conflict situation, and immediately take measures to eliminate any threats to peace. Such a process must be carried out in strict compliance with national legislation and international legal acts related to military issues. At this stage, the support of the world community is important.

The second stage is economic. A plan for compensation for material losses and restoration of economic activity of Ukraine must be developed. The process of compensation for material losses caused by hostilities is quite complicated and lengthy. At this stage, the help and support of the world community, in particular international experts, should be especially needed.

The third stage is social and cultural. Restoration of industries aimed at meeting the needs of society. Also by providing assistance to the civilian population that suffered from the war.

Currently, the process of post-war reconstruction of Ukraine has begun. In accordance with the Decree of the President of Ukraine dated 04/21/2022 No. 266/2022 (as amended) "Issues of the National Council for the Recovery of Ukraine from the Consequences of the War", the National Council for the Recovery of Ukraine from the Consequences of the War (hereinafter - the Council) was established, which is a consultative and advisory body under the President of Ukraine.

The main tasks of the Council:

- the development of a plan of measures for the post-war recovery and development of Ukraine, which, in particular, will provide for the restoration and development of transport, medical, social, communal, industrial infrastructure and housing, energy infrastructure, communications, military infrastructure and the military-industrial complex, structural modernization and restarting the economy, measures to overcome unemployment, support families with children, vulnerable sections of the population,

people who found themselves in difficult life circumstances as a result of the war, restoration and preservation of cultural heritage objects,
- definition and development of proposals for priority reforms, the adoption and implementation of which is necessary in the war and post-war periods,
- preparation of strategic initiatives, projects of regulatory and legal acts, the adoption and implementation of which are necessary for the effective work and recovery of Ukraine in the war and post-war periods.

The Council, in accordance with the tasks assigned to it:
- ensures the development and submission to the President of Ukraine of agreed proposals on the issues of restoration of Ukraine in the post-war period in key areas,
- develops proposals for a plan of measures for the post-war reconstruction and development of Ukraine,
- considers the proposals of state bodies, local self-government bodies, representatives of civil society institutions, as well as international organizations regarding the recovery of Ukraine from the consequences of the war,
- participates in the development of projects of regulatory and legal acts on the recovery of Ukraine from the consequences of the war,
- submits to the President of Ukraine appropriate recommendations and proposals developed based on the results of his work (Decree of the President of Ukraine, 2022).

It would be appropriate to supplement the list of the main tasks of the Council with one more item - the development of a plan to compensate for the material losses that Ukraine received in connection with hostilities.

Information and analytical support for the activities of working groups formed under the Council, as well as the preparation of proposals (information) for the performance of tasks assigned to working groups formed under the Council, in particular taking into account the positions of international partners, experts, diplomatic institutions, specialized associations, financial institutions, carries out Office of Reforms (Cabinet of Ministers of Ukraine, 2022).

It is also advisable that in the future the Office of Reforms becomes a single center for coordination of all reform programs. Reforms should solve not only the current problems that arose as a result of hostilities, but also the old problems.

Currently, the Council has started work on draft sections of the Action Plan for post-war reconstruction and development of Ukraine. The plan contains a list of measures for the post-war recovery and development of Ukraine, proposals for priority reforms and strategic initiatives, a list of legal acts, the adoption and implementation of which are necessary for the effective work and recovery of Ukraine in the war and post-war periods.

When developing the Plan of measures for the post-war recovery and development of Ukraine, first of all, one should take into account the fact that an individual approach to recovery should be applied to each region of Ukraine. Also in some cases, for individual populated points of one region in general will need to be applied separate approach Especially should take into account the fact that some populated points will have to be rebuilt from the very beginning as they are completely destroyed Restoration of such territories must be innovative. That's it restoration needs separate plan and separate financing.

It is necessary to develop a Plan of measures for the post-war recovery and development of the regions, taking into account the real geopolitical situation. In the basis of the Plan put experience post-war restoration regions European countries.

When forming the Plan, one should allocate attention the following points:

- restoration objects in critical infrastructure,
- restoration residential massifs in and industrial zones,
- restoration and maintenance security transport and energy infrastructure,
- restoration of objects historical and cultural heritage,
- reforming labor legislation,
- reformation tax legislation.

Restoration has passed gradually and transparently. Cost control must be established for recovery funds.

Currently, for financing restoration of Ukraine after of war, formed by the Government the following Funds:

- Small and Medium Business Support Fund,
- Forces of Ukraine Support Fund,
- Economic Recovery and Transformation Fund,
- Humanitarian Fund,
- Debt Management and Redemption Fund,
- Destroyed Property and Infrastructure Restoration Fund.

Perhaps, in order to avoid confusion, it would be expedient to combine all six funds into one - the Fund for the Restoration of Ukraine, in which to define certain directions.

Information about the start of the recovery funds is posted on the Government portal. The government calls on international partners, investors, public organizations, business representatives and citizens to provide financial support to Ukraine, which will contribute to the revival of the stability of the Ukrainian economy and help Ukrainians in the conditions of war.

The received funds will be used depending on the specialization of the fund. These are the support of the Ukrainian army and the provision of humanitarian aid to the victims, the reconstruction of the destroyed infrastructure and the transformation of the economy, the restoration of the work of small and medium-sized businesses and the maintenance of Ukraine's international financial obligations (Government portal, 2022).

For financing projects and activities provided for by the Plan, it will be appropriate to involve national and foreign investors. Funds, which will be selected foreign will be investors directed to a specific event, not to the country's budget directly Insignificant part measures with restoration can be financed from the account state funds or local budgets. Also restoration has be conducted within a reasonable time frame, because first of all, people should return to your housing or to work In Plan trace to determine amount financing each industry that needs recovery.

Currently there are many countries the world provide military, humanitarian and financial help Ukraine. Such help is enough important and with every day is getting closer Ukraine to victory.

When developing the Plan, it is necessary to follow take into account experience European countries which recovered after war.

Of question financing, expedient would turn focus on experience Georgia, in which restoration economy took place at the expense of loans international financial institutes. Also in Georgia were implemented recommendations International Monetary Fund and The World Bank regarding struggle with corruption, simplification administrative taxes and reforms production (Ivanov, 2019).

According to scientists and politicians also it will be appropriate to use the Marshall Plan - this program economic help European countries after The second world war _ The Marshall Plan too was one of pushed towards the European one integration .

The Marshall Plan provided for:

- restoration economic potential Western Europe,
- liquidation barriers trade,
- reconstruction and modernization of industrial facilities,
- development of the European infrastructure as a whole.

Appeals of the world politicians of development of the Marshall Plan for Ukraine are focused on the long-term perspective.

The opinion of Academician of the National Academy of Sciences of Ukraine B.M. Danylyshyn is quite correct. that successful work on the reconstruction and revival of the Ukrainian economy is impossible without solving the management problem.

We should agree with one more opinion of Danylyshyn B.M. that the funds that can be raised must be invested in capital investments in order to replace the materially and morally outdated fixed assets of Ukrainian enterprises. As a result of hostilities, some industries and productions were completely destroyed (Danylyshyn, 2022).

The following example is also quite interesting - a number of programs were used to restore the Balkan countries:

- SAPARD is a program aimed at the development of agriculture and mainly villages,
- OBNOVA is a program for the reconstruction of infrastructure and the return of refugees,

- Stabilization and Association Process (SAP) is a plan of the European Union to intensify the development of countries and bring them closer to the European Union. One of the main tools was the CARDS financial support program.

These programs can also be used to restore the regions of Ukraine, since:

- Ukraine is an agricultural country,
- rural areas occupy a fairly large territory of Ukraine,
- the infrastructure has suffered significant damage, in some regions it is completely destroyed and cannot be restored, and it will be advisable to rebuild it first,
- from February 24, 2022 to February 28, 2023, 8,104,606 refugees left Ukraine for Europe. This is evidenced by data from the official website of the Office of the United Nations High Commissioner for Refugees (UNCHR, 2022).

Quite interesting is the experience of the recovery of France, which applied the Plan of modernization and re-equipment, namely the following goals:

- increase labor productivity and strive for full use of available human resources.
- to develop the volumes of national production and foreign trade in those industries and sectors in which the country's position is most favorable (Podorycheva, 2022).

## 3. CONCLUSIONS

War breaks people and the country. The recovery process of each country depends on many factors - economic, geopolitical, cultural. Of course, having certain tools for economic recovery, they should be used correctly, because the success of the country's recovery depends on this. After the end of the war, it is necessary to return to normal life as soon as possible. The post-war recovery of both the regions and Ukraine as a whole is one of the primary and main measures of the authorities. The help of foreign partners is definitely needed for recovery. Without such assistance, there can be neither political stability nor peace. The restoration of the regions must be carried out taking into account the experience of European countries. Highly qualified specialists and foreign experts should be involved in the development of the Plan of measures for post-war reconstruction and development of the regions, and all possible reconstruction programs should be used. The question of financing the recovery process is important. With smart planning and proper financing, the recovery process will have the appropriate result.

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# BALANCING PROFITABILITY AND SUSTAINABILITY: THE CHALLENGES AND OPPORTUNITIES FOR EUROPEAN BUSINESSES IN ENVIRONMENTAL AND SOCIAL POLICIES

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**Abstract**
*This article provides a synthesis of various research papers, offering insights into the environmental and social policies that businesses in Europe are grappling with and the challenges and opportunities they face in balancing profitability and sustainability. The study found that complying with environmental regulations and implementing sustainable practices are significant challenges for businesses, particularly for small and medium-sized enterprises. However, environmental and social policies may also have a positive effect on businesses, with properly designed policies playing a critical role in reducing social inequality. The article also highlights the need for businesses to move beyond traditional eco- and socio-efficiency measures and embrace a more comprehensive approach to sustainability, and discusses effective policies for European businesses in relation to climate change, human rights, and social inequality. Overall, the findings suggest that while environmental and social policies can pose challenges for businesses, they can also create opportunities for sustainable and profitable growth.*
**Keywords:** *environmental policies; social policies; sustainability practices; renewable energy; financial barriers.*
**JEL Classification:** Q5, Q56

## 1. INTRODUCTION

In recent years, there has been a growing recognition that businesses have a responsibility to address pressing environmental and social issues. In Europe, businesses are grappling with a range of policies related to climate change, human rights, social inequality, and sustainability. While some policies may have a positive effect on economic performance, businesses may also face financial barriers that can deter eco-innovation. The UN Guiding Principles on Business and Human Rights and public procurement have been suggested as effective tools in promoting human rights in businesses. However, more needs to be done to reduce social inequality, and businesses need to shift their focus from profitability to sustainability in order to be successful in the long term. This article provides a synthesis of various research papers, offering insights into the environmental and social policies that businesses in Europe are grappling with and the challenges and opportunities they face in balancing profitability and sustainability. It also provides an overview of the challenges and opportunities for businesses in other parts of the world as they strive to address these issues.

The findings of Rivera *et al.* (2005), Wagner (2005), Schultz and Williamson (2005) and Sáez-Martínez, Díaz-García and González-Moreno (2016) highlight the importance of understanding the internal drivers that motivate businesses to prioritize environmental and social responsibility. While it may be initially challenging for businesses to cooperate with environmental and social protection policies, ultimately adopting pollution prevention strategies can lead to a more positive relationship between environmental and economic performance. Furthermore, companies need to view "carbon exposure" as a key factor in future corporate competitiveness. Despite the existence of environmental regulations, Sáez-Martínez, Díaz-García and González-Moreno's (2016) research suggests that internal drivers are more significant than external ones in promoting environmental responsibility among European SMEs. Therefore, there is a need for further research into the internal drivers that motivate businesses to prioritize environmental and social responsibility, and to identify effective strategies for promoting these values within organizations.

Knudsen, Moon and Slager's (2015) research suggests that the government CSR initiatives in Europe are increasingly focused on stronger regulations, which could be challenging for businesses to meet. This trend indicates that environmental and social regulations are becoming more stringent, posing a challenge for businesses to comply with. Costantini's *et al.* (2017) findings further suggest that businesses in Europe are struggling to reduce environmental stress, and that the effectiveness of eco-innovations varies depending on the technology adopted and the type of pollutant under scrutiny. This underscores the complexity of addressing environmental issues and the need for tailored solutions. Meanwhile, Ahlström's (2019) research suggests that the EU's business and financial market law has internalized corporate financialization processes, which may limit the EU's ability to create sustainable legislation. Despite the commitment of senior management and institutional efforts to spread the concept of sustainable development, practical cases are often characterized by organizational resistance and inertia (Belyaeva, 2018).

Such research can help businesses overcome initial resistance to environmental and social protection policies and can pave the way for more sustainable business practices in the future.

## 2. RESEARCH METHODS

To address the research questions outlined in this article, a systematic review of relevant literature was conducted. The literature search was carried out using academic databases such as Google Scholar, Scopus, and Web of Science. The search terms used included "environmental policies", "social policies", "businesses", "Europe", "climate change", "human rights", "social inequality", "costs", "financial implications", and "sustainability". The search was limited to papers published between 2015 and 2022.

The initial search yielded a large number of papers, and the titles and abstracts were screened to identify relevant studies. The inclusion criteria for the studies were that they must address at least one of the research questions outlined in this article and be published in English. The exclusion criteria were studies that did not address the research questions or were not relevant to the European context.

After the initial screening, a total of 25 studies were included in this review. The studies were reviewed in detail, and relevant findings were extracted and synthesized to address the research questions. The studies were categorized based on their relevance to each research question, and the findings were presented in the relevant sections of the article.

The limitations of this review include the limited scope of the literature search and the potential bias of the studies included. The findings presented in this article are based on the studies included in the review and may not be representative of the broader landscape of environmental and social policies in Europe. Further research is needed to provide a more comprehensive understanding of the challenges and opportunities faced by businesses in Europe in relation to environmental and social policies.

## 3. RESULTS

Environmental and social policies have become increasingly important for businesses in Europe in recent years. This study aimed to investigate the challenges and opportunities that businesses face as they strive to balance profitability and sustainability in the face of evolving environmental and social policies.

One of the most significant challenges for businesses in Europe is complying with environmental regulations and implementing sustainable practices (Sáez-Martínez, Díaz-García and González-Moreno, 2016; Ahlström, 2019; Lončar *et al.*, 2019; Camilleri, 2020). This challenge is particularly pronounced for small and medium-sized enterprises (SMEs), which may lack the resources and expertise to effectively navigate complex regulations and sustainability requirements (Graafland and Smid, 2017). Furthermore, policies encouraging corporate social responsibility, financial barriers to eco-innovation, and the EU’s commitment to sustainable development are among the most controversial policies that businesses in Europe are grappling with Knudsen, Moon and Slager (2015), Ghisetti *et al.* (2017), and Ahlström (2019).

However, environmental and social policies may also have a positive effect on businesses in Europe. Studies have found that properly designed policies can play a role in reducing social inequality (Knudsen, Moon and Slager, 2015; Ghisetti *et al.*, 2017), and that businesses that are proactive about the environment are better equipped to internalize environmental costs (Ferron-Vilchez, Torre-Ruiz and Mandojana, 2015; Lončar *et al.*, 2019). Additionally, policies promoting renewable energy, recycling, product design, and eco-innovations have been shown to be effective in promoting sustainability and profitability (Costantini *et al.*, 2017).

Furthermore, businesses in Europe generally view environmental and social policies as important (Graafland and Smid, 2017; Taliento, Favino and Netti, 2019). While there may be financial implications to implementing these policies, the overall impact may be positive for businesses (Bozeman and Link, 2015; Dechezleprêtre and Sato, 2017).

Interestingly, some of the studies also suggest that a company's neoclassical business worldview and increased competition levels resulting from internationalization and market deregulation are obstacles to sustainability (Viens and Fortier, 2018). However, studies also suggest that interdisciplinary interactions between the scientific community, policymakers, and business leaders can help overcome these obstacles (Viens and Fortier, 2018).

Finally, while the studies reviewed did not provide specific examples of businesses that have been able to successfully balance profitability and sustainability, they did suggest that businesses need to focus on sustainability in order to be successful in the long term (Di Fabio, 2017).

Overall, the findings of this study suggest that while environmental and social policies can pose challenges for businesses in Europe, they can also create opportunities for sustainable and profitable growth. It is crucial for businesses to take a proactive approach in implementing sustainability practices, and for policymakers to design policies that effectively balance environmental and social concerns with business interests.

First, we will discuss the need for businesses to move beyond traditional eco- and socio-efficiency measures and embrace a more comprehensive approach to sustainability. Next, we will examine the most effective environmental and social policies for European businesses in relation to climate change, including renewable energy, recycling, and product design. We will also explore the role of policies encouraging eco-innovations.

In the following sections, we will discuss the most effective environmental and social policies for European businesses in relation to human rights and social inequality. Specifically, we will examine the UN Guiding Principles on Business and Human Rights and public procurement as effective tools for promoting human rights in businesses. We will also examine the role of properly designed policies in reducing social inequality.

### 3.1 Moving Beyond Eco- and Socio-Efficiency: The Sustainable Business Agenda in Europe

Sustainable business models are becoming more popular and successful in Europe, with businesses changing their practices to become more sustainable. There are many mechanisms and solutions that can contribute to sustainable business model innovation, and there are many benefits to becoming an environmentally sustainable business (Nosratabadi *et al.*, 2020; Nacu, 2022).

Sustainable businesses are beneficial, have the potential to grow, and are responsible for ecological and social issues. Kajanová, Matúšová and Nováček (2023) found that sustainable businesses are a benefit to the economy of each EU member state and a source of growth and employment. Nacu (2022) found that companies are discovering sustainable strategies that give them the power to grow and the opportunities to scale marketplaces. Urbaniec (2018) found that sustainable entrepreneurship provides new opportunities for the development of corporate responsibility, taking into account ecological and social issues. Deselnicu *et al.* (2018) found that the EU and its Member States are committed to engage more effectively in working with international partners towards the adoption of Sustainable Development Goals as a follow-up to the Rio+20 conference.

Eco-innovations and sustainable entrepreneurship are key priorities for sustainable businesses in Europe. Costantini *et al.* (2017) found that eco-innovations help reduce environmental stress, and Urbaniec (2018) found that sustainable entrepreneurship provides new opportunities for the development of corporate responsibility. Nacu (2022) found that companies that are environmentally sustainable have a powerful reputation and many benefits. Ahlström (2019) found that the EU's business and financial market law has a path dependency that limits the EU's ability to create sustainable legislation. However, this does not mean that sustainable businesses are not a priority for the EU; rather, it suggests that the EU needs to reform its business and financial market law in order to make sustainable businesses a priority. Therefore, eco-innovations and sustainable entrepreneurship are key priorities for sustainable businesses in Europe.

Costantini *et al.* (2017) found that eco-innovations help reduce environmental stress, but the strength of these impacts varies across the value chain depending on the technology adopted and the type of pollutant under scrutiny. This suggests that there are both challenges and opportunities for sustainable businesses in Europe. Miralles-Quiros, Miralles-Quiros and Arraiano (2017) found that sustainability leadership is value relevant for investors on the 10 major European stock markets. This suggests that there are opportunities for sustainable businesses in Europe. Urbaniec (2018) found that sustainable entrepreneurship provides new opportunities for the development of corporate responsibility.

### 3.2 Effective Environmental and Social Policies for European Businesses in Relation to Climate Change

According to Littlewood *et al.* (2018), corporate commitment to climate change action is enhanced by business drivers and stakeholder pressure, but not sustainability drivers. This indicates that external pressures are more effective in motivating businesses to take action on climate change. Policy interventions can play a crucial role in stimulating eco-innovation, as highlighted Ghisetti *et al.*

(2017), who found that the policy framework is essential in reversing the risk/return trade-off of eco-innovative investments.

Lončar *et al.* (2019) discovered a strong relationship between innovation and "going green," while Sáez-Martínez, Díaz-García and González-Moreno (2016) found that environmental responsibility among European SMEs is positively associated with performance. Taliento, Favino and Netti (2019) reported that environmental, social, and governance information has a positive impact on economic performance. Additionally, Graafland and Smid (2017) found that social license pressures, as perceived by SMEs, significantly affect the environmental performance of micro, small, and medium-sized enterprises. Therefore, implementing environmental and social policies in Europe may have a positive impact on businesses.

### 3.3 Effective Environmental and Social Policies for European Businesses in Relation to Human Rights

The promotion of human rights in businesses can be facilitated through the use of effective tools such as the UN Guiding Principles on Business and Human Rights and public procurement. While promoting environmental responsibility among businesses, external drivers may not be as significant as internal drivers. According to Sáez-Martínez, Díaz-García and González-Moreno (2016), only around a fifth of European SMEs exceed environmental regulations. Meanwhile, Lončar *et al.* (2019) established that innovation is positively correlated with environmentally-friendly practices. In support of this, Moyo (2017) highlights the value and timeliness of the UN Guiding Principles on Business and Human Rights (GPs) in the ongoing debate surrounding business and human rights.

### 3.4 Effective Environmental and Social Policies for European Businesses in Relation to Social Inequality

Effective policies can play a critical role in addressing social inequality. Ghisetti *et al.* (2017) noted that financial barriers can hinder firms' eco-innovative capacity, but well-designed policies can mitigate such obstacles. Knudsen, Moon and Slager (2015) found evidence of policy convergence among 22 European Union member governments, particularly in terms of regulatory strength and issue application, indicating that policies can be effective in reducing social inequality. However, Sáez-Martínez, Díaz-García and González-Moreno (2016) found that only a minority of European SMEs exceed environmental regulations, highlighting the need for more action to reduce social inequality. Meanwhile, Nacu (2022) observed that companies are exploring sustainable strategies that enable growth and opportunities to expand marketplaces.

## 4. CONCLUSIONS

The findings of this review suggest that businesses in Europe face significant challenges in balancing profitability and sustainability in the face of evolving environmental and social policies. However, properly designed policies can play a critical role in mitigating financial barriers and reducing social inequality, while also promoting sustainable and profitable growth.

One of the most significant challenges for businesses in Europe is complying with environmental regulations and implementing sustainable practices. This is particularly challenging for small and medium-sized enterprises (SMEs), which may lack the resources and expertise to navigate complex regulations and sustainability requirements. Therefore, policymakers need to design policies that effectively balance environmental and social concerns with business interests while taking into consideration the specific needs of SMEs.

Environmental and social policies can have a positive effect on businesses in Europe, as evidenced by the findings of this review. Policies promoting renewable energy, recycling, product design, and eco-innovations have been shown to be effective in promoting sustainability and profitability. Furthermore, businesses that are proactive about the environment are better equipped to internalize environmental costs, leading to a more positive relationship between environmental and economic performance.

This review highlights the need for businesses to move beyond traditional eco- and socio-efficiency measures and embrace a more comprehensive approach to sustainability. Sustainable business models are becoming more popular and successful in Europe, with businesses changing their practices to become more environmentally sustainable. Eco-innovations and sustainable entrepreneurship are key priorities for sustainable businesses in Europe, and policies promoting these practices should be encouraged.

In addition, effective policies can play a critical role in promoting human rights and reducing social inequality. The UN Guiding Principles on Business and Human Rights and public procurement have been suggested as effective tools in promoting human rights in businesses, while properly designed policies can mitigate financial barriers and reduce social inequality.

Overall, the findings of this review suggest that while environmental and social policies can pose challenges for businesses in Europe, they can also create opportunities for sustainable and profitable growth. It is crucial for businesses to take a proactive approach in implementing sustainability practices, and for policymakers to design policies that effectively balance environmental and social concerns with business interests. Further research is needed to provide a more comprehensive understanding of the challenges and opportunities faced by businesses in Europe in relation to environmental and social policies.

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# RESOURCE EFFICIENCY AND CLIMATE CHANGE – IN THE CONTEXT OF THE IMPLEMENTATION OF THE CIRCULAR ECONOMY MODEL

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**Abstract**
*The challenges facing the EU in the field of energy include issues such as increasing dependence on imports, limited diversification, high and volatile energy prices, increasing global energy demand, security risks affecting producing and transit countries, growing threats represented by climate change, decarbonization, slow progress towards energy efficiency, the challenges arising from the growing share of renewable energy, as well as the need for greater transparency and better integration and interconnection in energy markets. The EU's energy policy is at its core a set of various measures, which aim to achieve an integrated energy market, ensure the security of the energy supply and sustainability of the energy sector, transition to renewable energy sources and reduction of primary and final energy consumption. Efficiency and impact of the circularity and energy efficiency policies of the Republic of Moldova are affected by gaps in the established policies, normative framework and practices. Energy efficiency projects, implemented on large scale by local public authorities, or by central public authorities are affected by practices that undermine regulatory norms. Important resources are invested in ineffective energy efficiency projects, without appropriate calculations of the investment efficiency, energy audit, energy profile of the buildings. Therefore, it is necessary to consolidate national policies for promotion of the*

*circular energy efficiency. This article reflects the most important issues related to policies to combat climate change, and aspects regarding the implementation of the most effective circular models in the Republic of Moldova. At the same time, the authors propose to trace the most important problems related to the efficiency of resources in the Republic of Moldova by solving them. The research was conducted within the State Program 20.80009.0807.22 Developing the circular economy mechanism for the Republic of Moldova.*

**Keywords:** *circular economy; energy efficiency; waste management; recycling; climate change; resource efficiency*.

**JEL Classification:** Q53, Q54

## 1. INTRODUCTION

A significant increase in the volume of waste generated globally and a decrease in the resources used on the European continent were registered during the last period. This is largely determined by structural changes in the economy caused by the financial crisis. The level of efficiency of resource use varies greatly from one country to another, world trade creating conditions for the transfer of pressures outside the borders of the EU.

The concept of the circular economy and related policies are a basis for the large-scale approach to the need to review the patterns of resource use, production, consumption and waste management. It aims to close the material circuit by keeping the value of products, materials and resources in the economy for as long as possible. This effectively reduces the generation of waste and the use of raw materials, while achieving a reduction in associated pressures.

According to existing studies (EEA, 2019) a better and more efficient use of natural resources represents in terms of accessibility and cost/benefit ratio a first method to reduce the impact on the environment while contributing to the achievement of the socio-economic and climate objectives of sustainable development. Environmental policies require a new evidence base that allows monitoring the scale of the physical economy – quantitative data on material, energy, water and land used and the emissions generated for manufacturing, use and provision of goods, services and infrastructure.

The actuality of the research is based on policy objectives that the European Union has assumed for the next strategic planning period. In particular the Sustainable Development Goals, the provisions of the Paris Climate Agreement. The Roadmap to a Resource Efficient Europe and the Circular Economy Package aims to transform the EU economy into a sustainable economy by 2050, followed by the ambitions of the European Green Deal and the new Circular Economy Action Plan which is a forward-looking agenda for a cleaner and more competitive EU and to fully contribute to climate neutrality. All of these are meant to create sustainable economic systems where economic growth is regenerative, decoupled from resource use and with a reduced consumption footprint (EP, 2022).

## 2. LITERATURE REVIEW

The Romanian scientist Nicolae Georgescu-Roegen in his work "Analytical Economics: Issues and Problems", published in 1966, substantiated the idea that economic growth has consequences on ecology and society and affects the future of humanity (Roegen, 1966). In 1972, the issue of eco-development was discussed during the UN Conference the Rome Club report entitled "Limits to Growth", addressed the issue of environmental pollution, resource depletion, explosive population growth, etc. The importance of this approach was emphasized by the Bhopal disaster (1984) and the Chornobyl accident. Therefore, the World Commission on Environment and Development was established, and the report elaborated in 1987 "Our Common Future" established the objectives of sustainable development. The purpose of the report was to find "a development path that will sustain human progress...for the entire planet and for the distant future".

According to EU legislation, the concept of "efficient use of resources" does not refer to the amount of resources consumed, it balances the use of natural resources in relation to economic benefits and the impact on the environment. The EU 2020 strategy has a double objective, namely decoupling the use of resources from economic growth, as well as decoupling the impact on the environment from the use of resources (EU, 2021).

Efficiency is inherently based on the relationship between inputs and outputs, and the possibilities for efficiency can be materialized in any improvement that increases the benefits obtained per unit of resource used (for example, resource productivity). Moreover, resource efficiency can also refer to any improvement that reduces the environmental impact per unit of resource used (over the entire life cycle of the product). Translating the concept of "resource efficiency" into economic results within business entities continues to be a major challenge for both, the public and private sectors. However, both sectors must work together to achieve this ambitious goal and implement successful practices. For companies, efficient use of resources can reduce production costs and increase profits - the so-called "win-win" scenario. When this is extended to the entire economy, resource efficiency can contribute to economic growth, while reducing the consumption of non-renewable materials, thus securing the supply of key materials (Government RM, 2020).

The basis of the environmental policy in the Republic of Moldova was established by the gradual expansion of the legal and normative framework, as well as of the strategic planning documents. The establishment of the Ministry of Environment in 1998 improved the structure and operating standards of environmental institutions. After an active period, when several environmental protection legislative acts entered into force, starting from 1999 no more important changes took place in this field, although a series of concepts and action plans involved the elaboration or adjustment of the legislative and normative framework.

In 2014, the first long-term strategic document in the field of environmental protection was approved in the Republic of Moldova - the Environmental Strategy for the years 2014-2023 (Government RM, 2014). The main objective of the document is to establish an effective management system of the environment, which will contribute to increasing the quality of environmental factors and ensure the population's right to a clean, healthy and sustainable natural environment. Being the first policy document of its kind in the field of environmental protection, the Strategy included a vast spectrum of planned activities in all environmental subfields, as well as very ambitious specific objectives related to the period of its realization. Thus, each law tends to establish its own implementation regime, which makes progress towards integrated management difficult. There is a need to implement similar practices in the case of all environmental compartments and to promote a holistic approach to environmental and waste management.

## 3. RESEARCH METHODOLOGY

The research analyses the problems faced by the Republic of Moldova in the field of environmental protection, sustainable management of natural resources, climate change and causes, including the description of possible consequences. The research is of a theorized type, as it focuses on the evolution of the notion of efficient use of resources, as well as on the context for emphasis on environment and climate issues, and was structured as follows: analysis of the state of knowledge relevant to the research problem, trends and identification of the solutions. The article highlights currently available research on climate change and identifies the contextual trends that mediate and moderate this relationship considering national economic conditions. Also, during the research, the following were applied: the interpretation of the results described in the specialized literature, the theory of depleted resources, systems analysis, and comparative analysis. Established factors were analyzed from a legislative, financial and social perspective.

## 4. RESEARCH RESULTS

The challenge of sustainable development is to identify the optimal interaction between the systems: economic, human, environmental and technological in a dynamic and flexible process of operation. Sustainability must be applied to all the subsystems that make up the dimensions of sustainable development, that is, starting from energy, agriculture, industry and up to investments, human settlements and biodiversity. The concept of sustainable development requires environmental protection to be harmonized with economic and social development. In these conditions, the connection between the need for economic and social development and environmental protection is essential.

According to the EU law, the rational use of natural resources was one of the first environmental concerns considered in the framework of the first European treaties. The Roadmap to a Resource Efficient Europe (COM(2011)0571) is one of the key initiatives in the 7th Environment Action Program (EAP). One of the main objectives is to unlock the EU's economic potential for better productivity with fewer resources, towards a circular economy. In addition, the recent circular economy package includes measures that will help boost the EU's transition to a circular economy by increasing the level of recycling and reuse, while also boosting global competitiveness, promoting sustainable economic growth and creating new jobs (EP, 2022).

Specific policies address the different elements of the circular economy paradigm. In the case of resource efficiency, these include the Road map to a resource-efficient Europe and the Roadmap to a low-carbon economy.

In this context, the European Union, through the Roadmap for the efficient use of resources, takes into account the progress made within the Thematic Strategy on the sustainable use of natural resources from 2005 (COM(2005)0670) and the EU Sustainable Development Strategy and establishes a framework for planning and implementing new actions. It also defines the structural and technological changes needed by 2050, including intermediate targets to be achieved by 2020. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact (EU, 2001).

According to the report The European Environment - state and outlook 2020, elaborated by the European Environment Agency, the EU environmental and climate policy landscape aims to address the short-, medium- and long-term time horizons through a range of policies, strategies and instruments that increasingly connect the environmental, social and economic dimensions of sustainability. However, the ambition of the $7^{th}$ EAP vision and frameworks such as the low-carbon economy, the circular economy and the bio-economy is such that it implies fundamental societal transitions to transform key production-consumption systems. While policy interventions can trigger the change needed, such ambition will ineluctably question our collective ways of living and thinking. One positive sign is increasing awareness and concern about societal environmental and climate challenges (EEA, 2019).

The Republic of Moldova registered limited progress in ensuring the transparency of environmental and climate assessments and towards the efficient use of resources. However, the most important factor that causes climate change and damages the environment is inextricably constituted by economic activities and lifestyles, especially the societal systems that provide people with basic necessities such as food, energy and mobility. So society's resource use and pollution have complex links to jobs and earnings across the value chain, to major investments in infrastructure, machinery, skills and knowledge, to people's be saviors and lifestyles, and to policies and public institutions.

The most important measures to mitigate climate change are reflected in national strategic documents and international agreements. According to the Paris

Agreement of 2015, ratified by the Republic of Moldova through Law no. 78/2017, an action plan was established to limit global warming below 2°C. In order to achieve the objective of the Paris Agreement, all its signatory Parties communicate according to Nationally Determined Contributions (NDC), about the efforts undertaken at the national level in order to reduce GHG emissions. The Republic of Moldova presented to CONUSC the first CND on September 25, 2015 (CNCRM, 2023).

The Republic of Moldova committed to reach ambitious targets for the reduction of GHG emissions by 2030. The unconditional target is to increase from 64-67% to 70% compared to the level recorded in the reference year (1990), and the conditional target will advance accordingly from 78% to about 88% compared to the level recorded in 1990 (see Table 1). The new targets for reducing GHG emissions will be introduced in the Low Emission Development Program of the Republic of Moldova until 2030 and the Action Plan for its implementation.

**Table 1. Sectoral targets for reducing GHG emissions, %**

| | 2025 | | 2030 | |
|---|---|---|---|---|
| **Sector:** | **unconditional** | **conditional** | **unconditional** | **conditional** |
| **Energy** | 83 | 87 | 81 | 87 |
| **Transport** | 56 | 58 | 52 | 55 |
| **Buildings** | 76 | 78 | 74 | 77 |
| **Industry** | 34 | 37 | 27 | 31 |
| **Agriculture** | 48 | 50 | 44 | 47 |

Source: (CNCRM, 2023)

However, the country's most important strategic planning document is the "Moldova 2030" National Development Strategy, which includes among its priorities the development of a sustainable and ecological economy, as well as adaptation to climate change in all economic sectors.

The key relevant priorities are based on two strategic international commitments. The first is the Association Agreement with the European Union, signed in 2014, and the second Agenda for Sustainable Development 2030. The Sustainable Development Goal (SDG) 8.4, located by the Government of the Republic of Moldova in 2017, specifies that the authorities are committed to improve progressively the efficiency of resources in consumption and production processes in order to decouple economic growth from degradation of the environment. In addition, SDG 12 is dedicated to responsible consumption and production. Thus, according to commitments, Moldova will fully incorporate the principles of sustainable development and effective management of national resources in the elaboration of national policies and regulations. Meanwhile, it will encourage industries and businesses to adopt resource-efficient production and share responsibility for eliminating toxic waste and pollutants (Government RM, 2020).

The implementation progress of Agenda 2030 was evaluated in 2020 in the framework of the first national voluntary evaluation report. Despite some progress, the review found many shortcomings. In particular, the field of environmental protection faces a lack of institutional capacity and funding from the state budget, as the financial resources available each year for environmental protection are obviously lower than those needed to face the existing challenges; sectoral strategies and programs estimate the cost at hundreds of millions of euros that remain to be uncovered and non-realistic. Therefore, it is quite important to re-evaluate funding in this area, revise the planning system and streamline budget allocations and increase transparency.

The Republic of Moldova, like many other countries, faces challenges in the field of resource efficiency, having limited natural resources. According to the OECD indicators on green growth, the most important indicators regarding the base of natural resources available to the Republic of Moldova are:

*Land resources.* The Republic of Moldova has a unique land fund, which is distinguished by the predominance of chernozem soils, with high productivity potential, very high degree of capitalization (>75%) and rugged relief: over 80% of agricultural land is located on slopes. According to the statistics, the total area of land is 3384.7 thousand ha, including 2492.1 thousand ha (73.6%) of agricultural land (1841.9 thousand ha – arable land and 283.5 thousand ha perennial plantations); 339.9 thousand ha (10.1%) – hayfields and pastures; 26.7 thousand ha (0.7%) – fallow land; 467.5 thousand ha (13.8%) – forests and lands with forest vegetation; 96.4 thousand ha (2.9%) – rivers, lakes, pools and ponds and 328.7 thousand ha (9.7%) – other lands. The extremely high degree of exploitation of the territory in agriculture requires the rational use, improvement and protection of soils against erosion, landslides and other consequences of reckless human interventions. The country is affected by a high level of degradation of natural resources such as soil, water and biodiversity. Application of environmentally friendly measures and technologies is limited. According to the Ecological Agriculture Atlas, only 1.4% of the territory of agricultural land was integrated into the organic system (NBS, 2023).

*Water resources.* In the Republic of Moldova, there are 3,621 rivers and streams, permanent or temporary streams with a length of more than 16 thousand km, 90% of which have a length of less than 10 km and only 9 exceed a length of 100 km. Large lakes, including for the provision of hydroelectric power plants, were created on the Prut River in collaboration with Romania - Costești-Stânca (59 $km^2$), on the Nistru River - Dubăsari (67.5 $km^2$), Cuciurgan (27.3 $km^2$) and on the Bac River - Ghidighici (8.8 $km^2$). Approximately 40% of the rural population is supplied with water from underground layers with hydrostatic pressure, with around 4,970 wells taken into account (in 2020, only 2,614 wells were exploited, including for drinking water – 1,666, with technical destination – 662, with agricultural destination – 47, with industrial destination – 224, with curative destination – 16), respectively the water supply also takes place from the first aquatic layer (without pressure), from about 178.7 thousand wells, of which arranged – 144.9 thousand wells, and 3,094 thousands of springs, of which developed – 2,060 thousand springs, which ensures about 1.8 million m3/day of confirmed reserves. Of the total amount of groundwater administered on the territory of the country, only 50% can be used for drinking purposes without prior treatment.

*Forestry resources.* The degree of afforestation is 11.4% with variations depending on the area: in the North - 7.2%, in the Center - 13.5% and in the South - 6.7%.

*Biodiversity.* The geographical location, the climate and the relief have determined the formation of varied and species-rich vegetation - the flora of the Republic of Moldova currently includes about 5513 species of plants: superior - 1989 species and inferior - 3524 species. According to the floristic composition, the richest are the forest (over 850 species), steppe (over 600 species), meadow (about 650 species), petrophyte (about 250 species), aquatic and marsh ecosystems (about 160 species). In the Republic of Moldova, there are five scientific reserves with a total area of 19,497 thousand ha. Two forest reserves - "Codrii" and "Plaiul Fagului" - are located in the centre of Moldova; two others - "Prutul de Jos" and "Pădurea Domnească" - are located in the Prutriver valley; the fifth reservation - "Iagorlâc" from Dubăsari district - aims to protect and study the unique aquatic ecosystem of the Dniester River.

All these indicators are largely influenced by air quality degradation issues. A higher concentration of pollutants is observed only in the municipality of Chisinau and near large power plants. However, the overall air pollution situation in Moldova turned out to be a favourable one, especially compared to other European countries, including Ukraine and Romania. In the Republic of Moldova, from 1750 to the end of 2021, the concentration of $CO_2$ increased by about 148.4%, the concentration of $CH_4$ - by 264.2%, and the concentration of $N_2O$ by about 123.9%, these trends can be largely attributed to human activities, especially the burning of fossil fuels and the continuous deforestation of forested areas.

In order to solve environmental problems in the Republic of Moldova, it is necessary to implement necessary and effective tools based on the increased application of processes, products and services of environmental pollution prevention strategies with the aim of increasing efficiency and reducing risks for the human factor and the environment. An effective tool would be Resource Efficiency and Cleaner Production (RECP), it refers to the methods and practices of Cleaner Production as tools that generate multiple benefits relevant to solving the following global problems, such as migration of greenhouse gas emissions and adaptation to climate change, the depletion of water resources, fuel and other natural resources, ensuring decent jobs, stopping environmental degradation.

Resource Efficient and Cleaner Production (RECP) represents the continuous application of preventive environmental strategies to processes, products, and services to increase efficiency and reduce risks to humans and the environment. RECP addresses the three sustainability dimensions individually and synergistically:

a) heightened economic performance through improved productive use of resources
b) environmental protection by conserving resources and minimizing the industries' impact on the natural environment
c) social enhancement by providing jobs and protecting the wellbeing of workers and local communities.


Source: (ODA, 2022)

**Figure 1. Techniques RECP**

Several complementary RECP techniques or practices are possible, ranging from low or even no cost solutions to high investment, advanced clean technologies, including:

- Good Housekeeping: Changes in operational procedures and management in order to eliminate waste and emissions generation. Examples are spill prevention, improved instruction, and the training of site personnel;
- Input Material Change: The use of less polluting raw materials and the use of process auxiliaries (such as lubricants and coolants) with a long service lifetime;
- Technology Change: For example, improved process automation, process optimization, equipment redesign, and process substitution;
- Recycling: The useful application or reuse of waste materials at the same company at which they were generated, and recycling outside of the company;

- Product Modification: Change of the characteristics of the product, such as material composition and shape. This way, the life time of the new product could be extended, the product, made easier to repair, or the manufacturing of the project could become less polluting. The changes in product packaging are generally also regarded as product modifications.

Enterprises and other organizations that adopt RECP "do more with less"; they increase the efficiency with which they use materials and energy, they improve their productivity and thus their competitiveness. At the same time, through greater efficiency, enterprises reduce the amount of pollution and waste they generate, thus lowering their impact on the environment, including their carbon footprint. As waste and emissions reduce, and hazardous substances are eliminated, the risks of industrial operations to workers, communities, and consumers also decrease. Briefly speaking, businesses and other organizations that implement RECP methods, practices, and technologies gain a triple benefit:

- Enhancing the efficient use of natural resources including water, energy and materials;
- Minimization of the impact on the environment and nature by preventing the generation of waste and emissions (including those discharged into water, air, or on land;)
- Minimization of risks to people and communities from the use of chemicals, and the safe disposal of chemicals used in industry (ODA, 2022).

In addition, the companies that apply the RECP methodology will benefit from an improved environmental compliance, environmental image, and relationships with their customers and stakeholders.

## 5. CONCLUSIONS

The research carried out in the study demonstrates that the transition of the Republic of Moldova to a circular economy was initiated. A systemic and comprehensive approach is needed to facilitate this process. Circular economy models can play an essential role in mitigating climate change by reducing greenhouse gas emissions through the implementation of sustainable management tools, especially in businesses. These opportunities can include creating new jobs, stimulating innovation and generating income from secondary materials. Thus, supporting businesses on their way to transformation must become a priority at the government level, by creating an enabling regulatory framework and supporting measures for the potential beneficiaries.

Capitalization of the potential for the reduction of GHG emissions in the Republic of Moldova largely depends on how the barriers that stand in the way of implementing actions to reduce and sequester carbon emissions could be overcome. Financial, technical and capacity constraints, specific to each sector, are described in the Environmental Strategy for the years 2014-2023, the Low Emission Development Program (PDER - 2030) and in the Action Plan for its implementation. Following the above, we note that important steps are being taken in the Republic of Moldova towards the transition to a circular economy and international practices have begun to be successfully implemented in our country (Government RM, 2020).

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# LEGAL AND PRACTICAL CHALLENGES IN FIGHTING PRIVATE SECTOR CORRUPTION IN THE EU

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**Abstract**
*Private sector corruption is a serious threat to business, distorting competition, generating higher business costs, and preventing economic growth in the long term. During the last twenty years, the European Union (EU) reshaped its anti-corruption policy and legislation according to international anti-corruption standards. However, recent scandals have revealed weaknesses in the EU anti-corruption system. The paper presents an overview of EU legislation and practices targeting corruption in the private sector, making recommendations for improvement.*
**Keywords:** *private sector corruption, business corruption, European legislation***.**
**JEL Classification:** D73, K42, M10

## 1. INTRODUCTION

Corruption is a complex and multifaceted phenomenon that can take many forms and affect various sectors of society, including government, business, civil society, and the media. It involves the misuse of power, authority, or resources for personal gain or the benefit of a select group of individuals, often at the expense of the wider public interest.

Private sector corruption is generated by unethical or illegal practices within private companies, including businesses, non-profit organizations, and other non-governmental entities. It can take many forms, such as fraud, embezzlement, insider trading, price fixing, kickbacks, and bribery.

Examples of private sector corruption include executives using their position to award contracts to companies in which they have a financial interest, companies bribing government officials to gain access to contracts or regulatory approvals, and employees embezzling funds from their employers.

Private sector corruption can have serious consequences, including reputational damage, loss of investor confidence, and legal penalties. It can also harm competition, reduce economic efficiency, and negatively affect the well-being of society.

To combat private sector corruption, many countries have implemented laws and regulations, such as anti-bribery and anti-corruption laws. Companies have also developed their own internal policies and codes of conduct to prevent corruption and encourage ethical behavior among their employees.

However, eliminating private sector corruption remains a significant challenge for governments and private entities as well. Companies must respect the law and remain vigilant and proactive in addressing these issues to maintain public trust and integrity.

## 2. LITERATURE REVIEW

Private sector corruption has been the subject of extensive academic research and literature. In this literature review, we will summarize some of the key findings from recent studies on private sector corruption.

A multitude of studies refer to the determinants of private sector corruption and potential solutions to fight it. Thus, Rose-Ackerman (1999) provides a comprehensive analysis of corruption, including its causes, consequences, and strategies for reform. The author argues that corruption in the private sector is often linked to corruption in the public sector and highlights the importance of good governance and transparency in addressing the problem.

In their book, Miller, Roberts and Spence (2005) discuss the philosophical foundations of corruption and anti-corruption measures. The authors argue that corruption is a complex phenomenon that requires a multifaceted approach, including legal, ethical, and cultural factors. Also, Lambsdorff (2007), in his book, provides a theoretical and empirical analysis of corruption and reform. The author argues that corruption is a systemic problem that requires institutional reforms, including the strengthening of legal frameworks, regulatory mechanisms, and civil society participation.

One theme that has emerged from the literature is the relationship between private sector corruption and economic development. Studies have found that corruption in the private sector can have a significant negative impact on economic growth, as it can undermine competition, reduce investment, and distort markets. For example, a study by Campos and Pradhan (2007) found that corruption in the private sector was associated with lower levels of foreign direct investment. Also, their report provides a comprehensive analysis of corruption in different sectors, including the private sector. The authors argue that corruption in the private sector is often driven by the lack of regulation and accountability, as well as weak enforcement mechanisms. On the same lines, Serra (2006) examines the determinants of corruption in the private sector. The author finds that factors such as the level of competition, regulatory quality, and economic development are significant predictors of corruption in the private sector.

Another area of research has focused on the role of corporate governance in preventing corruption in the private sector. Studies have found that firms with stronger governance structures, including independent boards and effective internal controls, are less likely to engage in corrupt activities (e.g., Wei, 2000). Other research has highlighted the importance of ethical leadership and corporate culture in preventing corruption (e.g., Treviño *et al.*, 1999).

A third theme in the literature is the impact of corruption on various stakeholders, including employees, customers, and society as a whole. Studies have found that corruption can have significant negative effects on employee morale and productivity, as well as on customer trust and satisfaction (e.g., Doh and Quigley, 2014). Corruption can also contribute to social inequality and undermine public trust in institutions.

Finally, some studies have explored the effectiveness of anti-corruption measures in the private sector. For example, a study by Batra and Stone (2008) found that voluntary initiatives, such as corporate social responsibility programs, were not effective in reducing corruption, whereas legal and regulatory measures were more successful. Also, D'Souza and Kaufmann (2013) argue that eventhough larger and foreign-owned firms are less likely to bribe than smaller domestic ones, eventually they give in, partially adapting to their host country's corrupt environment. On the same lines, Persson, Rothstein and Teorell (2013) article examines why anticorruption reforms often fail in the private sector. The authors argue that corruption is a collective action problem that requires a coordinated effort from different actors, including governments, businesses, and civil society.

In conclusion, specialists agree that private sector corruption is a complex phenomenon that requires an interdisciplinary approach to address it. The literature highlights the importance of good governance, transparency, and accountability in addressing the problem. Furthermore, it is crucial to address the systemic nature of corruption and involve multiple actors in the reform process.

## 3. PRIVATE SECTOR CORRUPTION IN THE EUROPEAN UNION

During the last 20 years, the European Union (EU) has tried to follow exactly the same kind of approach to combat corruption as specialists around the world suggest, namely, one based on a multiple-pronged strategy.

Public awareness of private sector corruption in the EU has increased in recent years, due in part to high-profile scandals such as the Volkswagen emissions scandal and the Panama Papers. This has led to calls for stronger legal and regulatory frameworks, increased transparency and accountability, and greater public awareness of the risks and consequences of corruption.

The perception of private sector corruption in the European Union varies depending on the country and sector, but there is a general concern about the prevalence of corruption and its negative impact on society and the economy.

The Corruption Perceptions Index (CPI) by Transparency International ranks EU countries based on perceived levels of corruption in the public sector. While the CPI does not measure private sector corruption directly, it can indicate the overall perception of corruption in a country. According to the 2022 CPI, some EU countries such as Denmark, Finland, and Sweden rank among the least corrupt countries in the world, while others such as Romania, Bulgaria, and Hungary rank lower and are perceived to be more corrupt (Transparency International, 2022).

There is also a perception that certain sectors are particularly vulnerable to corruption in the EU, including the construction industry, energy sector, and financial sector. A 2021 report by the European Commission's Directorate-General for Justice and Consumers found that corruption in the construction sector is a significant problem in several EU countries, with concerns around bid-rigging, bribery, and conflicts of interest. The report also identified corruption risks in the energy sector, particularly in relation to public procurement and permits (Directorate General for Justice and Consumers, 2021).

While perceptions of private sector corruption in the EU vary, there is a growing recognition of the need to address the issue and promote transparency, accountability, and integrity in all sectors of society.

Private sector corruption is a challenge in the European Union, with instances of corruption being reported across various sectors and industries.

Over the years, there have been several cases in the European Union that have set important precedents for fighting private-sector corruption.

In 2008, Siemens AG, a German engineering company, agreed to pay $1.6 billion in fines for bribing government officials to win contracts in several countries, including Argentina, Bangladesh, and Venezuela. The multinational conglomerate was fined €201 million by German authorities and $800 million by US authorities for bribery and corruption. The case led to changes in German law to make companies liable for the actions of their employees and to encourage them to establish compliance programs to prevent corruption.

In 2014, the French multinational company Alstom was fined €772 million by French authorities for bribery and corruption related to contracts in several countries, including Indonesia, Egypt, and Saudi Arabia. The company was accused of using bribes and kickbacks to win contracts and secure favorable treatment from government officials.

Two years later, VimpelCom, a Netherlands-based telecommunications company, agreed to pay $795 million to settle bribery and corruption charges related to its activities in Uzbekistan and, in 2017, Telia Company AB, a Swedish telecommunications company, agreed to pay $965 million to settle similar charges. Both companies were accused of paying bribes to Uzbek officials to secure access to the country's telecommunications market.

In 2018, Italian oil and gas company ENI was accused of bribery and corruption related to contracts in Algeria. The company was accused of paying bribes to Algerian officials in exchange for favorable treatment, including access to oil and gas fields.

Also, the same year, Danske Bank, a Danish bank, was accused of laundering $230 billion in suspicious transactions through its Estonian branch. The case led to calls for stronger anti-money laundering regulations and greater transparency in the banking sector.

One year later, in 2019, Swiss pharmaceutical company Novartis agreed to pay $347 million in fines for bribing doctors to prescribe their drugs. The case highlighted the need for greater transparency in the healthcare industry and for companies to establish robust compliance programs to prevent corruption.

Another notable example of private sector corruption in the EU is the Volkswagen emissions scandal, in which the company installed software to cheat on emissions tests for its diesel cars. The scandal resulted in fines, legal action, and significant damage to the company's reputation.

Additionally, the construction industry has been identified as a sector particularly vulnerable to corruption in the EU, with concerns around bid rigging, bribery, and conflicts of interest.

These cases demonstrate the importance of effective legal frameworks and enforcement mechanisms to prevent and combat private sector corruption. They also highlight the need for companies to establish robust compliance programs and for greater transparency and accountability in all sectors of society.

### 3.1 EU legal instruments to combat corruption in the private sector

The European Union has implemented various measures to combat private sector corruption, including legal and regulatory frameworks, transparency and accountability mechanisms, and public awareness campaigns.

The EU Anti-Corruption Framework includes a number of international main legal instruments aimed at preventing and combating corruption, including the Council of Europe Criminal Law Convention on Corruption and the Civil Law Convention on Corruption, and the Council of Europe Convention on Laundering, Search, Seizure, and Confiscation of the Proceeds from Crime and on the Financing of Terrorism.

Also, the EU has recognized the power and usefulness of other international anti-corruption conventions such as the United Nations Convention against Corruption (UNCAC) and the Organisation for Economic Co-operation and Development (OECD) Convention on Combating Bribery of Foreign Public Officials in International Business Transactions. These conventions require parties to criminalize various forms of corruption and bribery, including in the private sector, and establish measures for prevention, investigation, and prosecution. Unfortunately, even though EU Member States have laws that criminalize bribery, not all of them have signed, ratified, and implemented the OECD convention that specifically targets private sector corruption and we believe that this should become an EU priority.

When it comes to its own legal anti-corruption instruments, the EU has created several legal instruments to fight private sector corruption.

Thus, the Convention on the Fight against Corruption Involving Officials of the European Communities or Member States of the European Union was signed since in 1997 and it was meant to address both public and private sector corruption.

However, the key EU legal instrument remains the Council Framework Decision 2003/568/JHA on combating corruption in the private sector. However, since 2003, not all EU Member States have properly transposed and implemented this Framework Decision that criminalizes both active and passive bribery in the private sector and imposes criminal liability to legal persons involved in corrupt activities.

According to the European Commission Report of 2019, the transposition of the legal text by Member States has improved since 2011 first implementation report. The sanctions respecting the EU thresholds for active and passive bribery have been introduced in the EU members' national criminal codes. Unfortunately, essential elements of the text, such as "accepting the promise of a bribe" and "undue advantage" have been left out or extended outside the purpose initially intended. Furthermore, some Member States decided to exclude non-profit organizations from being held liable in case of corruptive behavior, while others imposed certain conditions in which the offense may be committed. (European Commission, 2019)

The EU's main anti-private sector corruption legislation is complemented by EU sectorial legislation that comprises various legal instruments. For example, Whistleblower Protection Directive, which came into force in December 2019, provides legal protection for individuals who report corruption, fraud, and other illegal activities in the private sector. The directive requires companies to establish internal reporting channels and protect whistleblowers from retaliation.

Also, the EU Anti-Money Laundering Directive aims to prevent money laundering and terrorist financing in the EU. This directive requires companies to conduct due diligence on customers and transactions, report suspicious activities, and maintain records. In the EU, the Directive on the Criminal Sanctions for Money Laundering and the Directive on the Fight against Fraud to the Union's Financial Interests are examples of legal instruments that impose criminal liability on companies for certain offenses, including corruption. Corporate liability national laws are thus imposed in all Member States, holding companies liable for corrupt practices committed by their employees or agents.

In 2014, the EU decided to revise its public procurement directives to ensure that public procurement processes are transparent, non-discriminatory, and competitive. The directives require public authorities to award contracts to the most economically advantageous bidder and to exclude bidders who have been convicted of corruption or other criminal offenses.

At the same time, the EU Non-Financial Reporting Directive requires large companies to disclose information on environmental, social, and governance issues, including anti-corruption measures. This helps to promote transparency and accountability in the private sector.

We believe that all these legal instruments provide a framework for preventing and combating private-sector corruption in the EU. However, their effectiveness depends on effective implementation and enforcement by national authorities, and ongoing efforts are needed to promote transparency, accountability, and integrity in all sectors of society.

### 3.2 EU infrastructure to combat corruption in the private sector

The European Union addresses the issue of corruption through various initiatives, reports, and assessments coordinated by different EU bodies.

Initially, the European Commission was the one in charge of the EU anti-corruption reporting mechanism which aimed to assess and address corruption within EU member states. Unfortunately, the first and only report was presented in 2014 and it provided an overview of corruption-related challenges across the EU and recommended measures for improvement and action. Presently, the European Union's assessment and reporting of corruption is mostly based on the Council of Europe mechanisms since all EU Member States are also its members.

In 1999, the European Anti-Fraud Office (OLAF) was established with the primary goal of protecting the financial interests of the EU. Thus, its main objective is to detect, investigate, and prevent fraud, corruption, and any other illegal activities involving EU funds.

Another independent body, the European Public Prosecutor's Office (EPPO) was established in 2020 and it also has the power to investigate and prosecute crimes against the EU budget, including corruption and fraud. EPPO can investigate cases involving private sector corruption and hold individuals and companies accountable.

At the same time, the EU closely cooperates with Member States to combat corruption in general and monitor their progress. The Cooperation and Verification Mechanism (CVM) is specifically designed for countries that recently joined the EU and have ongoing challenges related to corruption and the rule of law.

However, when it comes to private sector corruption, the European Commission focuses only on member states so far, excluding EU institutions and cross-border corruption, although those are the ones that fall between national jurisdictions and need more attention from the EU. One good example to support this critique is the Panama Papers scandal, in which leaked documents revealed the involvement of European companies and individuals in offshore tax havens, potentially facilitating tax evasion and other illicit activities.

We strongly believe that the EU needs its own assessment and reporting mechanism for corruption and a special body in charge of coordinating the anti-corruption actions in both public and private sectors.

### 3.3 Solutions to combat corruption in the private sector

Private sector corruption remains a challenge in the European Union, and ongoing efforts are needed to promote transparency, accountability, and integrity.

Several solutions can be used to curb private sector corruption in the European Union, solutions that are already put in practice to some extent, such as: strengthening the legal framework, enhancing transparency, promoting ethical business practices, empowering civil society, and strengthening international cooperation.

The EU needs to strengthen its legal frameworks by implementing stricter regulations and harsher penalties for companies and individuals found guilty of corruption. This can include increasing fines, imposing criminal liability on companies, and making it easier for whistleblowers to report corruption.

Greater transparency can help prevent corruption by making it easier to detect and expose corrupt practices. This can include requiring companies to disclose more information about their ownership structure and beneficial owners, as well as making public procurement processes more transparent.

The EU can promote ethical business practices by encouraging companies to establish compliance programs and codes of conduct that promote integrity and discourage corrupt practices. This can include providing guidance and resources to companies, as well as promoting ethical leadership and culture.

Civil society can play a vital role in preventing and exposing corruption by monitoring companies and governments, advocating for transparency and accountability, and promoting public awareness and engagement. The EU can empower civil society by providing better funding and support for advocacy and watchdog organizations, as well as by protecting and promoting the rights of journalists, activists, and whistleblowers.

Corruption is a global problem, and thus, international cooperation is essential to prevent and combat it. The EU needs to better work with other countries and international organizations to share information, coordinate efforts, and promote best practices in preventing and combating private-sector corruption.

## 4. CONCLUSIONS

Private sector corruption is a major challenge that affects economic development and social welfare globally. It is a complex phenomenon involving various forms of unethical behavior by businesses and their employees, including bribery, embezzlement, fraud, and other illicit activities.

Fighting and discouraging private sector corruption in the European Union requires a multi-faceted approach that includes legal, regulatory, ethical, and social solutions. The EU is currently making efforts in this respect, but the results are not always meaningful. Thus, we believe that the European Union still needs more effective governance structures, better-represented ethical leadership, and more articulated and stricter legal and regulatory measures if it wants to create a culture of integrity and accountability that promotes transparency, ethical business practices, and responsible governance.

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# ROLE OF WOMEN-DRIVEN BUSINESSES IN THE POST-COVID ECONOMIC RECOVERY

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**Abstract**
*The paper presents the challenge for companies of the Republic of Moldova in meeting the future post-COVID-19 economic activity in response to new demands of the market and society, with special attention to women-lead companies. The objective of the paper is to present policy recommendations for supporting local companies in recovering their economic activity after the end of the COVID-19 lockdown. The research method is a national survey for local small and medium companies, including those driven by women, to identify the impact of COVID-19, best practices to overcome the challenges, and demand for support in economic recovery. The result of the national survey will be used to carry out research for policy recommendations to support small and medium enterprises in recovery after the end of the COVID-19 lockdown. The overall goal of the policy recommendations is to strengthen the capacity and resilience of small and medium enterprises in Moldova to mitigate the economic and social impact of the COVID-19 crisis. The role of women-driven SMEs can become crucial in the post-COVID-19 recovery phase if they are provided with the necessary incentives. This can be one of the ways to restart small and medium-sized enterprises or even to create new ones when job opportunities are scarce. SMEs can benefit from clear guidelines on access to financing, access to markets, access to advanced technologies, and a favorable environment created by proper government policies and legislation.*
**Keywords:** *post-COVID economic recovery; women's role in business development; women in business.*
**JEL Classification:** G18, G38

## 1. INTRODUCTION

The role of micro, small, and medium-sized companies in delivering energy-efficient products and in providing renewable energy equipment can become crucial in the post-Covid-19 recovery phase if they are provided with the necessary incentives. This can be one of the ways to restart micro, small and medium-sized companies or even to create new ones when job opportunities are scarce micro, small and medium-sized companies can benefit from clear guidelines on access to financing, access to markets, access to advanced technologies, and a favorable environment created by proper government policies and legislation. They will also benefit from concrete examples of successful implementation of measures by micro, small, and medium-sized companies, including repurposing that led to significant economic gains. The paper provides guidelines to micro, small, and medium-sized companies on access to financing, markets, and advanced technologies and recommendations to Governments for developing policy guidelines and establishing financial incentives schemes.

The companies needed to organize their work schedules remotely and working at home was necessary which in turn affected the production and the ability of the micro, small, and medium-sized companies to respond to their contractual obligations, which means delivering products. On the other hand, the closure of the borders in the country affected the supply of materials process. The micro, small, and medium-sized companies were not prepared to face the consequences of the immediate crisis and especially were not prepared for the prolonged effect of the pandemic.

## 2. METHODOLOGY

The methodology (UNECE, 2020) used in this paper includes the following tools:

**∗ Collection of primary data through a "MSMEs COVID-19" survey**

In one month, an "MSMEs COVID-19 effects" survey was conducted through the industry sectors, and other stakeholders interested in EE and RE initiatives. The Questionnaire was sent to 369 companies and MSMEs (ie: 269 – companies; 100 – energy auditors and energy managers). The respondents represent 320 companies administrated by men, and 49 companies administrated by women.

**∗ Collection of primary data through interviews with selected MSMEs**

For this paper, 14 in-depth interviews were conducted, with a wide spectrum of companies in the pellets manufacturing, energy audit services, and renewable energy sectors. During the interview process, it was gathered qualitative information that would supplement the quantitative data received from the survey.

**∗ Collection of secondary survey data**

For some parts of the paper, two other publications were drawn upon: "Analysis of the sectors of the economy affected by COVID-19 carried out by the Sectoral Committees of the Republic of Moldavia" done by ETF survey in 2020 (UNDP, 2020); and "Impact analysis of COVID-19 on gender" (CPD/UNWOMEN, 2020): Assessment of the impact of COVID-19 and drought on jobs, companies and households" (The World Bank, 2022) done by the World Bank. The surveys noted here were used in conjunction with the survey conducted within this project to clarify the effects that the COVID-19 crisis has on the revenue streams, operation mode, production, and in general, on the work environment, particularly because of delivering energy-efficient products and providing renewable energy equipment.

∗ **Desk analysis**

While at present the global, let alone domestic, literature is yet scarce in a rigorous assessment of Covid-19's impact on the investment environment of MSMEs with regards to EE and RE investments, the few available reports (National Agency for Energy Regulations of the Republic of Moldova, 2023) are used throughout the analysis either to compare the global (United Nations Climate Change, 2023) and local expectations or to cross-reference expected effects in the Republic of Moldova.

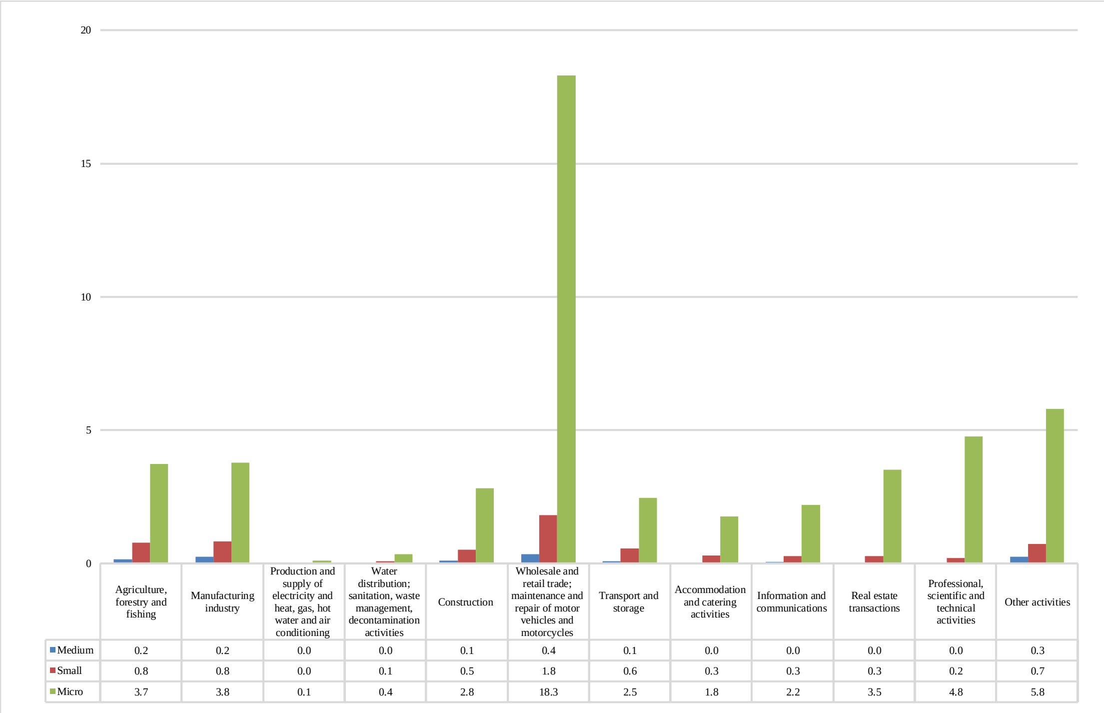
∗ **Collection of administrative data sources**

Limited and selected administrative data were collected from the Government to obtain an initial impression of the effects of the crisis on the MSMEs. Administrative data (National Bureau of Statistics, 2020) have also been collected on the planned and executed fiscal spending from the Government, Ministry of Finance, as well as for the particular subsidies for the industry from the Ministry of Economy.

## 3. THE RESULTS

The most represented sectors in the country's economy are the service sector and professional activities. In terms of numbers, micro-enterprises are dominant in every sector. In 2020, the predominant part of micro, small, and medium-sized companies (MSMEs) carried out their activity in the field of trade, accounting for 20.5 thousand enterprises, or 35.7% of the total micro, small and medium-sized companies (MSMEs). In the manufacturing industry worked 4.8 thousand micro, small and medium-sized companies (MSMEs) or 8.5% of the total MSMEs. The division of sectors shows also that the micro, small, and medium-sized companies (MSMEs) related to energy-efficient products and in providing renewable energy equipment are no exception from this practice. (Figure 1) shows the number of active business entities by sector of activity and by size (UNDP, 2020).

Affected by the pandemic and a severe drought, economic activity of the Republic of Moldova plummeted in 2020, with Gross Domestic Product (GDP) declining by 7%. The main drivers of Gross Domestic Product (GDP) decline were household consumption, which also declined by 7%, followed by investment and inventories. On the supply side, the lockdown measures have halted trade and industrial production while a severe drought has impacted agriculture. Employment dropped to a five-year low. In 2021 the economy has started to rebound gradually, but most of the short-term indicators remain in negative territory.




| | Agriculture, forestry and fishing | Manufacturing industry | Production and supply of electricity and heat, gas, hot water and air conditioning | Water distribution; sanitation, waste management, decontamination activities | Construction | Wholesale and retail trade; maintenance and repair of motor vehicles and motorcycles | Transport and storage | Accommodation and catering activities | Information and communications | Real estate transactions | Professional, scientific and technical activities | Other activities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Small | 0.8 | 0.8 | 0.0 | 0.1 | 0.5 | 1.8 | 0.6 | 0.3 | 0.3 | 0.3 | 0.2 | 0.7 |
| Micro | 3.7 | 3.8 | 0.1 | 0.4 | 2.8 | 18.3 | 2.5 | 1.8 | 2.2 | 3.5 | 4.8 | 5.8 |

Source: developed by author based on data from National Bureau of Statistics (2020)

**Figure 1. Number of active business entities by sector of activity and by size, thousand, 2020**

In 2020, lower energy prices and weak domestic demand have resulted in a contraction in imports by 10.5%, which has compensated the decline in the volume of exports (-11.5%) and in remittances (-0.4%). As a result, the Current Account Deficit (CAD) has narrowed to 6.7% of Gross Domestic Product (GDP) from 9.3 in 2019. The deficit was mainly financed by deposits and cash holdings and debt instruments, predominantly public. External debt reached 70.1% of Gross Domestic Product (GDP), 8 % age points (pp) higher than in 2019. Foreign reserves are at a 15-year high of USD 3.7 billion.

In the Republic of Moldova according to the study "Analysis of the sectors of the economy affected by COVID19 carried out by the Sectoral Committees of the Republic of Moldova" (UNDP, 2020): about 68% of HoReCa (Hotels, Restaurants, Catering) sector companies; 43% of MSMEs in the area of tourism; and 40% of creative industries are closed due to COVID-19.

The survey of the current study shows that about 90% of interviewed MSMEs (mainly microenterprises) are completely closed due to COVID-19 in the Republic of Moldova. The Questionnaire was sent to 369 MSMEs (ie: 269 –

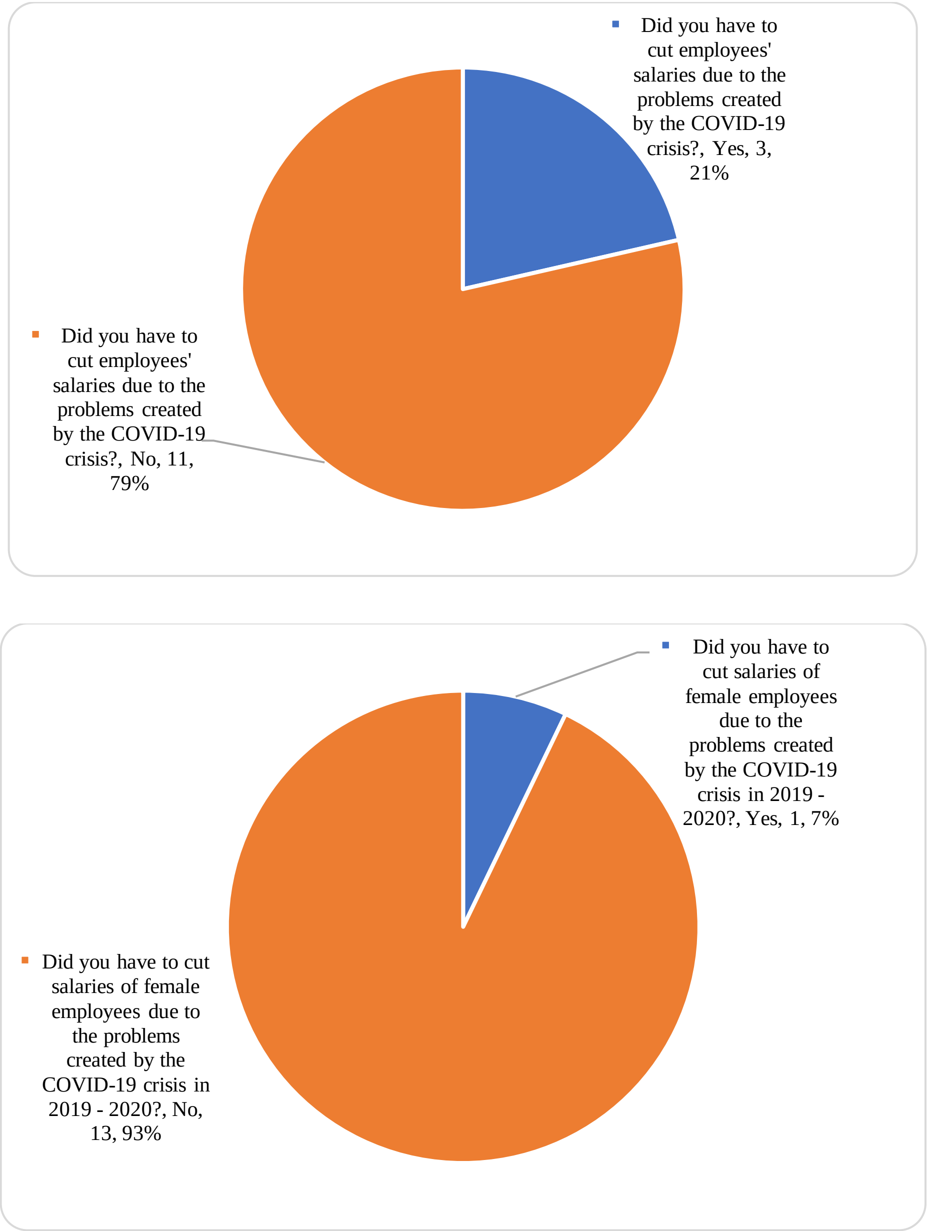
companies; 100 – energy auditors and energy managers). The respondents represent 320 men and 49 women. Microenterprises providing energy-related services and products are a majority in the Republic of Moldova compared to medium and small enterprises and have been hardest hit by the crisis.

Gender impact of Covid-19 on MSMEs was originally analyzed in the Republic of Moldova in the framework of the study "Impact analyses of Covid-19 on gender" (CPD/UNWOMEN, 2020). One of the recommendations of the study is "to provide consistent tax support to employers to ensure the balance between professional and personal life of employees. Given that the measures taken by the authorities to combat the effects of the pandemic (e.g. stopping the activity of some companies, educational institutions, etc.) were felt differently by women and men, both in terms of their presence in the labor market, as well as of obtaining income, mainly because of unequal division of child-care responsibilities, Thus, the support provided by the authorities, such as those of fiscal nature, is to be directly proportional to the results of interventions undertaken by employers that come to address the issue of exclusion of women, in particular of those with preschool children, from the work".

The COVID-19 pandemic and efforts to contain the disease have shocked local and global labor markets, threatened livelihoods, introduced new workplace risks, and made precarious work relationships even more precarious. Women have borne the brunt of layoffs and loss of livelihoods, sacrificed their health at the frontlines of the pandemic response, and disproportionately shouldered the burden of additional caregiving associated with COVID-19. There is a real risk that without efforts to understand the immense and disproportionate impact of COVID-19 on women and identify policies that prioritize the needs and health of women, the national progress on gender equality will be rolled back.

About 21% of MSMEs were forced to decrease salaries for employees, out of which about 33% are women. The figure below shows the COVID-19 impact on the salaries of MSME employees.

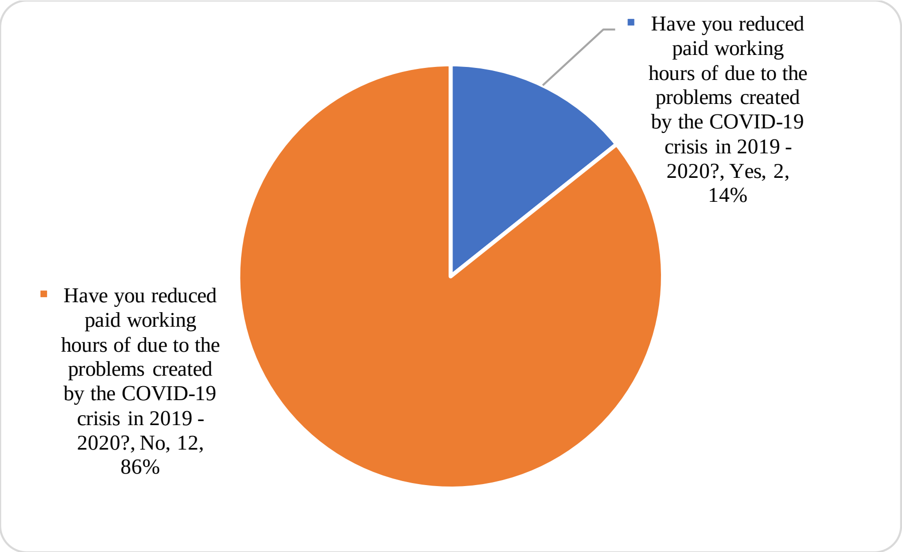
According to the data presented by the NBS, the number of unemployed people in 2020 was estimated to be 33.1 thousand, being in decrease compared to the level of 2019 (46.9 thousand). However, in the National Agency of Employment database, in 2020 there are 50.2 thousand unemployed people were registered as unemployed, which is by approx. 32.2% more compared to 2019. The observation of the study is that women are the most affected by COVID-19 crisis.

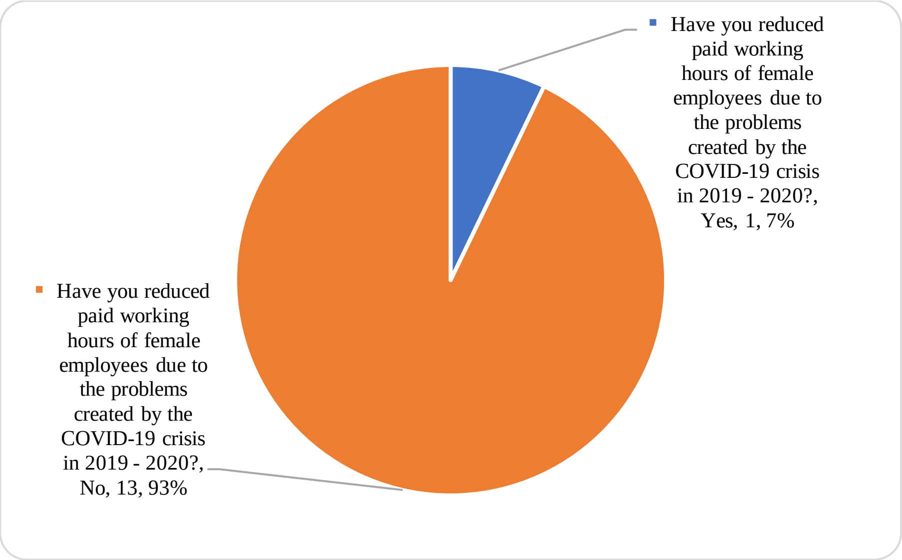



Source: (UNECE, 2020)

**Figure 2. The COVID-19 impact on salaries of MSMEs**

About 14% of micro, small, and medium-sized companies (MSMEs) were forced to reduce the paid working hours due to the COVID19 crisis, of which 50% reported that women employees received less payments as a result of reduced working hours (Figures 2 and 3).




Source: (UNECE 2020)

**Figure 3. The COVID-19 impact on working hours of MSMEs**

There is a demand on specific research to investigate ways the COVID-19 experience can inform, improve and safeguard women's health and socioeconomic well-being against future health emergencies, including infectious pandemics, environmental disasters or other large-scale acute events with actual or potential significant negative health impact or societal disruption. Governmental funds should be allocated for this specific research with a focus on how an improved and more nuanced understanding of the relationship between women's work and health can strengthen the design, implementation and impact of prevention, preparedness, response, and recovery policies, programs and strategies for future pandemics and health emergencies.

## 4. CONCLUSIONS

It would help MSMEs during post-COVID-19 period to consider part-time contract employment for some categories of non-key workers. Training of existing employees in new areas would help to increase the flexibility of MSMEs to the new market demand.

The study shows that the MSMEs in the energy sector are driven by men. Women should be more actively involved in sectors that traditionally are dominated by men, like engineering, project design, project supervision, monitoring and evaluation process. The research and training institutions should pay more attention to women candidates in the area of energy-related activities.

Dedicated support during post-COVID-19 period to these MSMEs would be very helpful to maintain sustainable development of the energy sector of the country.

A delay in payments for goods and services of energy related MSMEs during the pandemic period is observed. It would be useful for these companies to consider in the future or during post-COVID-19 period the advanced payment options in contracting business partners, to avoid delays in payments.

The country has a good internet network and a potential to use it. The issue is that many MSMEs do not know how to access investors due to specific procedures. The study shows a demand for supporting MSMEs in the area of preparation of project proposals for investors.

The COVID-19 restrictions have indicated to the local companies that there is a huge potential for using IT technologies for business development. We recommend in the post-COVID19 period that the MSMEs increase their capacity of using IT and applying new opportunities in daily activities. Some support from the Government of Moldova is provided by building the internet platform for companies for electronic signature, e-governance platform, e-banking, and other supporting mechanisms. The companies will benefit from IT if properly applied in their business.

**ACKNOWLEDGEMENTS**

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# A LOOK AT MICROINSURANCE: AN OVERVIEW OF LOWER-MIDDLE-INCOME COUNTRIES

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***Abstract***
*This thesis has an overview of the development of microinsurance in India and in African countries. The relevance of the development of the microstacking sector is considered, as one of the financial services that contributes to the eradication of poverty in countries with lower-middle incomes. According to the World Bank, the monetary measurement of poverty by SDG indicators includes the following indicators: the poverty rate at 2.15% per day, the poverty rate at the national poverty line, GDP per capita, GDP per employed, the proportion of people living below 50 percent of median income and the population living in slums (% of the urban population). The sample consists of 15 countries with a high proportion of the population living below the poverty line. The thesis shows the difference between traditional insurance and microinsurance in customer orientation, sales models, premium calculations, policies, and claim processing. Also, the institutions that laid the foundation for the development of the microinsurance sector are presented. The table provides information on microinsurance providers and products in lower-middle-income countries. For example, microinsurance companies such as Activist for Social Alternatives (ASA), Shepherd and Spandana in India, which have a 30–year history, began their activities as a socially oriented organization, later using microinsurance to protect against unforeseen risks, vulnerable segments of the population. According to the World Bank, in 2021, 65% of the population live in rural areas and 82.7% of the working-age population is employed in the informal sector, which together is the target market for microinsurance. The majority of the Indian population belongs to low-income groups and microinsurance is a necessary tool to protect people from unforeseen risks. According to the report, the Landscape of Microinsurance 2021 in 2020, from 17 to 37 million people, i.e. from 4% to 9%, were covered by microinsurance in 13 African countries. The average insurance premium per insured person in Africa in 2020 was US$ 11.6 and US$ 14.00 in 2019. According to the collected data, among the population of Africa in 2020, according to the line of microinsurance products, the most preference is given to medical insurance products, while overtaking such products as funeral insurance, life insurance, credit life insurance, etc.*
**Keywords:** *SDG indicators; poverty coefficient; microinsurance; microinsurance products; microinsurance institutions*.
**JEL Classification:** G2, G22

## 1. INTRODUCTION

As a universal call for action to eradicate poverty and prevent families from falling into poverty, the Sustainable Development Goals (hereinafter SDGs) were adopted in 2015 by the United Nations (hereinafter UN), which unites countries to ensure development in 17 integrated areas. The first goal is the eradication of poverty. Today, it is one of the priority tasks to increase the resilience of the poor and reduce their vulnerability to extreme events related to climate and other economic, social, and environmental shocks. As of 2015, about 736 million people were still living on less than $1.90 per day. 80 percent of those living in extreme poverty are in regions such as South Asia and sub-Saharan Africa (UNDP, 2023).

**Table 1. Key development indicators for the SDGs of lower-middle-income countries**

| Countries | Poverty headcount ratio at $2.15 a day (2017 PPP) % of population | Poverty headcount ratio at national poverty lines (% of population) | GDP per capita (current US %) | GDP growth (annual %) | Proportion of people living below 50 percent of median income (%) | Population living in slums (% of urban population) |
|---|---|---|---|---|---|---|
| Algeria | 0.5 | 5.5 | 3690.6 | 45 376 | 6.3 | 13 |
| Angola | 31.1 | 32.3 | 1953.5 | 15 411 | 22.8 | 63 |
| Bangladesh | 13.5 | 24.3 | 2457.9 | 14 886 | 6.1 | 52 |
| Congo, Rep. | 35.4 | 40.9 | 2290 | 10 810 | 21.5 | 44 |
| Cambodia | - | 17.7 | 1625.2 | 7 777 | - | 40 |
| India | 10.0 | 21.9 | 2256.6 | 20 703 | - | 49 |
| Kenya | 29.4 | 36.1 | 2081 | 11 154 | 14.0 | 51 |
| Kyrgyz Republic | 1.3 | 25.3 | 1276.7 | 14 307 | 5.0 | 2 |
| Lao PDR | 7.1 | 18.3 | 2535.6 | 15 072 | 10.3 | 22 |
| Nepal | 8.2 | 25.2 | 1208.2 | 7 179 | 7.2 | 40 |
| Nigeria | 30.9 | 40.1 | 2065.7 | 17 883 | 13.2 | 49 |
| Philippines | 3.0 | 16.7 | 3460.5 | 21 350 | 13.0 | 37 |
| Uganda | 42.2 | 21.9 | 883.9 | 6 244 | 13.4 | 54 |
| Zimbabwe | 39.8 | 38.3 | 1773.9 | 4 507 | 16.8 | 22 |
| Sri Lanka | 1.3 | 4.1 | 4013.7 | 37 920 | 9.7 | - |

Source: (World Bank, 2019)

According to the World Bank data for 2019 (Table 1), about 10 million Angolan citizens, about 2 million people living in the Republic. Congo, about 15 million people live in Kenya, and about 62.8 million of Nigeria's population live below the poverty line, i.e. belong to the category of extremely poor, amounting to $2.15 per day in 2017 prices. In 2019, about 648 million people were in such conditions worldwide.

For Uzbekistan, the relevance of microinsurance is also primarily justified by the scale of the poor population, whose share was 15% of the total population at the beginning of 2020. According to the Central Bank of the Republic of Uzbekistan, 38.7% of household respondents classified themselves as a group with incomes of 2-4 million. sum per month, the level of well-being of the main part of households remains relatively low, but at the same time technically equipped (Azimov, 2022).

The fundamental reasons for the underdevelopment of countries are vulnerability to risks such as illness, physical injury, accident, death, and loss of property. In most cases, the poor are not financially ready to cope with risks due to a lack of access to risk protection services. After many years of developing the financial sector aimed at the low-income market, it became clear that in order to lift people out of poverty, a combination of factors is required, including stable employment, vocational training, access to markets and finance, and economic growth in general. Without a doubt, insurance is a mechanism that provides economic protection for everyone. Increasing the inclusiveness of insurance through microinsurance offers and a greater variety of insurance products is the main strategy for creating a social protection system for the poor, including the middle-income population (Wanczeck, 2017). Microinsurance itself is considered a poverty-oriented service that complements other financial services such as payments, savings, and loans.

## 2. EXPERIENCE OF MICROINSURANCE IN LOWER-MIDDLE-INCOME COUNTRIES

Microinsurance is based on the same generally accepted practices as traditional insurance, for example, actuarial pricing, reinsurance and claims processing.

However, microinsurance products are not just abbreviated traditional products available on the shelf (Table 2). The experience of microinsurance in low-income markets has shown that there are fundamental differences.

**Table 2. The difference between traditional insurance and reinsurance**

| | Traditional insurance | Microinsurance |
|---|---|---|
| **Clients** | • Low risk environment<br>• Established insurance culture | • Higher risk exposure/high vulnerability<br>• Weak insurance culture |
| **Distribution models** | • Sold by licensed intermediaries or by insurance companies directly to wealthy | • Sold by non-traditional intermediaries to clients with little experience of insurance |

| | Traditional insurance | Microinsurance |
|---|---|---|
| | clients or companies that understand insurance | |
| **Policies** | • Complex policy documents with many exclusions | • Simple language<br>• Few, if any, exclusions<br>• Group policies |
| **Premium calculation** | • Good statistical data<br>• Pricing based on individual risk (age and other characteristics) | • Little historical data<br>• Group pricing<br>• Often higher premium to cover ratios<br>• Very price sensitive market |
| **Control of insurance risk** (adverse selection, moral hazard, fraud) | • Limited eligibility<br>• Significant documentation required<br>• Screenings, such as medical tests, may be required | • Broad eligibility<br>• Limited but effective controls (reduces costs)<br>• Insurance risk included in premiums rather than controlled by exclusions<br>• Link to other services (eg credit) |
| **Claims handling** | • Complicated processes<br>• Extensive verification documentation | • Simple and fast procedures for small sums<br>• Efficient fraud control |

Source: (Lloyds, 2020)

**Table 3. Microinsurance providers and products**

| Institution – Start of microinsurance | Country | Persons covered (year of data) | Main microinsurance product |
|---|---|---|---|
| Activists for Social Alternatives (ASA) – 1993 | India | 55 000 (2004) | Term life (linked to credit) |
| American International Group Uganda (AIG Uganda) – 1997 | Uganda, Tanzania U.R., Malawi | 1,6 million. (2003) | Accidental death and disability (AD&D) integrated with credit life |
| BRAC Micro Health Insurance for Poor Rural Women in Bangladesh (MHIB) – 2001 | Bangladesh | 12,000 families (2004) | Health |
| CARD Mutual Benefit Assosiation (CARD MBA) | Philippines | 580 000 (2003) | Life, integrated credit life and disability |
| Christian Enterprise Trust Zambia (CETZAM) – 2000 | Zambia | 5 000 (2004) | Credit life, funeral, property |
| Delta Life – 1988 | Bangladesh | 859 000 (2002) | Endowment |

| Institution – Start of microinsurance | Country | Persons covered (year of data) | Main microinsurance product |
|---|---|---|---|
| Karuna Trust – 2002 | India | 61 000 (2004) | Per diem income during hospitalization |
| Madison Insurance – 2000 | Zambia | 30 000 (2003) | Credit life and funeral |
| Shepherd – 1999 | India | 15 000(2004) | Life, livestock, health |
| Spandana – 1998 | India | 390 000 (2004) | Credit life, spousal death and limited asset loss |
| Taytay Sa Kauswagan (TSKI) – 2002 | Philippines | 330 000 (2004) | Credit life, life |
| TUW SKOK – 1998 | Poland | 93 000 (2003) | Property, savings completion and AD&D |
| L'Union des Mutuelles de Santé de Guinée Forestière (UMSGF) – 1999 | Guinea | 14 000 (2005) | Health |
| L'Union Technique de la Mutualité Malienne (UTM) – 1998 | Mali | 40 000 (2005) | Health |
| VimoSEWA – 1992 | India | 120 000 (2005) | Integrated life, health and asset |
| Yasiru Mutual Provident Fund – 2000 | Sri Lanka | 24 000 (2004) | Integrated accident, disability, life and health |
| Yeshasvini Trust – 2002 | India | 1,45 млн. (2005) | Health |

Source: (Churchill, 2006)

Microinsurance in India. Table 3 shows the institutions of development of microinsurance in India for more than 30 years of history, which prove that, at present, this country has the most dynamic microinsurance sector in the world. The liberalization of the economy and the insurance sector has created new opportunities to cover the vast majority of the poor, including those who work in the informal sector. However, market penetration is largely determined by supply, not demand (Kashyap, Anthony and Krech, 2006).

Institute of Microinsurance Activist for Social Alternatives (ASA). Founded in 1986 and working for the benefit of the poor in a drought-prone area of central Tamil Nadu. In 1993, ASA launched a microfinance program called "Dawn of the Rural Poor". As a logical continuation of microfinance, ASA proposed microinsurance (Roth, 2005).

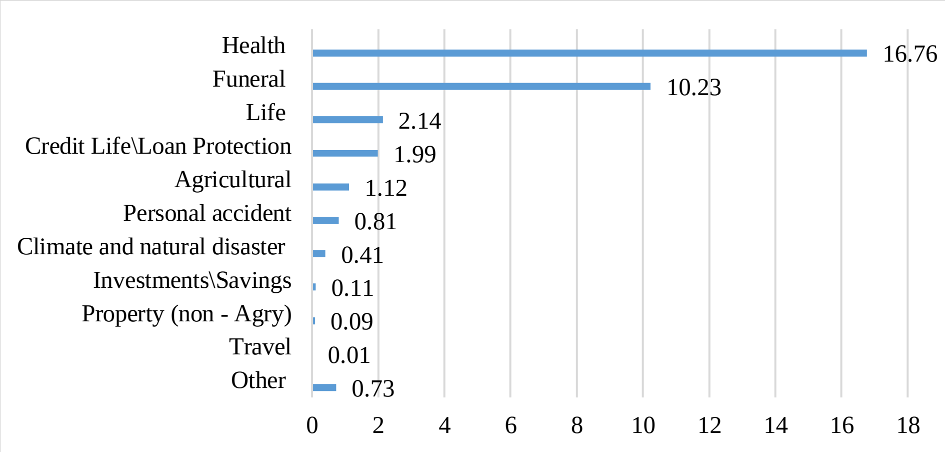
Shepherd was organized in 1995. The main objectives of which were: to instill the habit of saving; to help women lead a sustainable lifestyle and protect them from disasters and risk, i.e. to reduce their vulnerability. Since 1999

Shepherd has been exploring the possibility of introducing insurance. Since, based on the accidents that occurred, it was concluded that insurance should not be associated with microcredit, since risks can arise when people do not have an outstanding loan.

Spandana was formed in 1992, but microfinance began in 1998. Spandana creates a regulated non-bank financial institution that carries out its lending activities in order to facilitate access to financial markets. Nevertheless, microfinance did not fulfill the role of a social cushion as protection against unforeseen risks. Based on the above-mentioned experience in the field of microfinance, Spandana continued its activities as a microinsurance organization. Based on the above, it can be argued that each of them started their activities more as a socially oriented organization, later using microinsurance to protect against unforeseen risks, and vulnerable segments of the population.

According to IMARC statistics, the volume of the microinsurance market in India in 2022 reached 307.7 million US dollars, for the previous fiscal year 2017-18, the number of microinsurance policies sold amounted to 0.84 million. According to the World Bank, in 2021, 65% of the population lives in rural areas and 82.7% of the working-age population is employed in the informal sector, which together is the target market for microinsurance. Nevertheless, the penetration and density of insurance in India as of 2020 amounted to 3.69%, which is low compared to global reports. According to a survey conducted by the Insurance Institute of India in collaboration with GIZ on microinsurance in 2014, out of 1.25 billion people, 40% of rural and 45% of urban households earned between 5,000 and 12,000 rupees per month (Singh, Prahat and Srinivasan, 2020). That is, the majority of the Indian population belongs to low-income groups and microinsurance is a necessary tool to protect people from unforeseen risks. The expansion of rural participation, by opening offices in rural areas and the development of simple comprehensive insurance products is accompanied by an increase in the penetration and density of insurance in India.

Microinsurance in Africa. According to the latest data from the report Landscape of Microinsurance 2021 (Landscape of Microinsurance 2021) in 2020, from 17 to 37 million people, i.e. from 4% to 9% were covered by microinsurance in 13 African countries. (Ivory Coast, Egypt, Ghana, Kenya, Morocco, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe). The population of which was covered by a total of 18.7 million policies. For comparison, in 2019, these figures amounted to 29.6 million people and from 2% to 7%, respectively. The average insurance premium per insured person in Africa in 2020 was US$ 11.6 and US$ 14.00 in 2019.




Source: (Merry, 2021)

**Figure 1. People covered by product line in Africa (millions)**

Figure 1 characterizes that medical microinsurance products cover most of the population in Africa while overtaking such products as funeral insurance, life insurance, credit life insurance, etc. It can be assumed that one of the reasons is the increase in the share of domestic private health spending in total current health spending, i.e. such expenses can either be prepaid to voluntary health insurance or paid directly to health care providers. According to the World Bank, the share of funds financed by the private sector within the country in 2019 in Algeria was 34.96%, Angola 55.61%, Rep. Congo 54.06%, Kenya 35.51%, Uganda 43.86%, Zimbabwe 52.81% and Rwanda 26.26% and Tanzania - 22.97%. For comparison, this indicator in 2018 was equal to Algeria - 34.16%, Angola -54.59%, Rep. Congo – 59.20%, Kenya – 34.74%, Uganda 39.71%, Zimbabwe - 42.77%, Rwanda - 25.58%. Tanzania – 21.65%. It is logical that in 2020 the demand for medical microinsurance products will increase due to the COVID–19 pandemic.

## 3. CONCLUSIONS

The formation and development of microinsurance institutions (Table 3), in turn, leads to the creation, development, and implementation of a product line, the investigator is one of the key factors in the progress of the microinsurance sector. Among the countries with incomes below average, the most successful in our opinion is India, which has passed the stages of the formation of this sector, starting from a socially oriented organization, to microfinance, the logical continuation of which is microinsurance.

In addition to the microinsurance products sold, technology-based integration plays an important role in the development of the sector to expand the business and attract customers. The Internet allows insurance companies to significantly reduce the costs of doing business, and this type of cost is significant for an insurance company. The uniqueness of using the Internet to sell insurance services is that the policyholder and the insurer have the opportunity to conclude an insurance contract without the participation of an intermediary (agent), which reduces the cost of insurance services by an average of 20-25% (Azimov, 2022).

Today, there is no doubt that microinsurance is a promising sector experiencing sharp growth both in its activities and in innovative processes. According to statistics, between 179 and 377 million people were covered by microinsurance products and programs in 30 countries in 2021. For comparison, in 2020, this figure ranged from 162 to 253 million people in 28 countries (Merry, 2021).

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# UNLOCKING NEW OPPORTUNITIES: THE IMPACT OF OPEN INSURANCE ON TRADITIONAL BUSINESS MODELS

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**Abstract**
*Open insurance refers to a new approach to insurance that leverages digital technology and data sharing to create more transparent, flexible, and personalized products and services. Current trends in open insurance include the use of APIs, partnerships with insurtech startups, and the adoption of new business models that prioritize customer engagement and experience. The impact of open insurance on traditional business models is significant, as it challenges the dominance of established players and requires them to adapt to new market conditions. Insurers must become more agile, innovative, and customer-centric to compete in an open insurance ecosystem, where customers have greater control over their data and demand more personalized and value-added products and services. They also need to collaborate more closely with technology partners, startups, and other stakeholders to leverage the benefits of open data and digital platforms.*

*Open Insurance, as a new approach, has the potential to impact the insurance industry in the short, medium, and long term.*

*In the short term, open insurance can disrupt the traditional insurance model by enabling new players to enter the market and offering customers more choices and innovative products. This can result in increased competition and pressure on traditional insurers to adapt to the changing market dynamics.*

*In the medium term, open insurance can lead to more efficient and transparent operations by leveraging digital platforms, data analytics, and automation. This can result in improved risk management, faster claims processing, and lower costs for both insurers and customers.*

*And in the long term, open insurance can transform the insurance industry by creating a more customer-centric, personalized, and value-driven ecosystem. This can result in new business models, revenue streams, and opportunities for growth and innovation.*

**Keywords:** *open insurance; traditional; innovation; insurance; technology.*
**JEL Classification:** G22, G23, G52, I22, I25, M21

## 1. A NEW APPROACH TO THE INSURANCE INDUSTRY

The insurance industry has been around for centuries and has gone through various transformations over time. The recent trend of open insurance is the latest manifestation of this industry's evolution. Open insurance is an innovative approach to insurance that has the potential to revolutionize the industry. In this article, we will discuss what open insurance is, how it works, and its impact on the industry. We will also explore the challenges and opportunities that open insurance presents to both insurers and customers.

*What does the concept of Open Insurance represent?*

There is currently no universally accepted definition of this new concept, with EIOPA (European Insurance and Occupational Pensions Authority, 2023) considering open insurance in its broadest sense as „products and/or services based on accessing and sharing insurance-related personal and non-personal data, usually through APIs (application programming interfaces)."

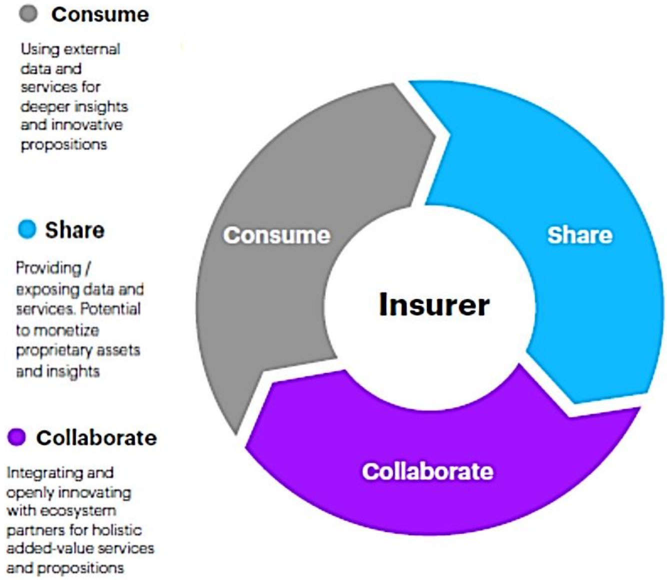
Open insurance refers to the process of sharing data and services among various stakeholders in the insurance industry. It involves creating a digital platform that connects insurance companies, customers, and third-party service providers. This platform allows for the exchange of information, services, and products among different parties (Lexology, 2023).

The open insurance platform is designed to create a more efficient and customer-centric insurance industry. It offers customers greater transparency and control over their insurance policies and provides insurers with better access to customer data, which enables them to create more personalized products and services.

Another approach refers to open insurance as the creation of an open insurance ecosystem, in which customers have access to a wide range of insurance products and services from different providers, through a common digital platform (Endava, 2022).

*How Does Open Insurance Work?*

Open insurance is built on the principles of open banking, which is a similar approach used in the financial services industry. It involves creating an open application programming interface (API) that allows different parties to access and share data. The API acts as a bridge between the different systems used by insurers, customers, and third-party providers (Figure 1).




Source: (Insuranceblog, 2020)

**Figure 1. Open insurance business models**

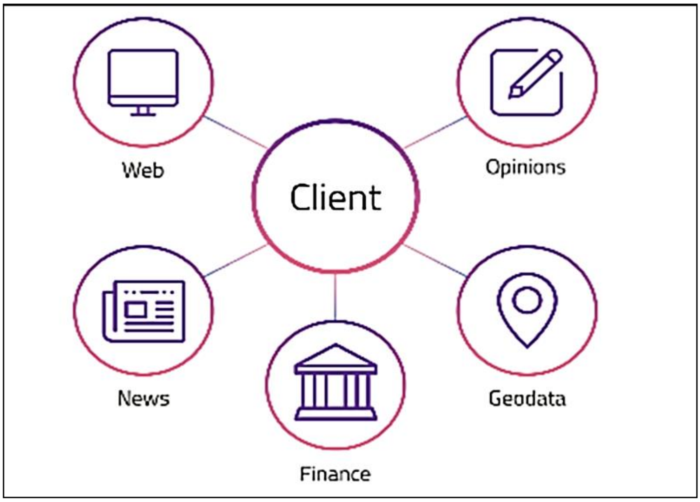
The open insurance platform enables insurers to offer more personalized products and services to their customers. For example, if a customer has a health insurance policy, the insurer can use data from wearable devices to create a customized health plan that meets the customer's specific needs. Similarly, if a customer has a car insurance policy, the insurer can use data from the car's telematics system to adjust the premium based on the customer's driving habits.

Open insurance has the potential to transform the insurance industry in several ways. Firstly, it will create a more customer-centric approach to insurance. Customers will have more control over their insurance policies and will be able to access a wider range of products and services.

Secondly, open insurance will lead to greater efficiency in the industry. Insurers will have better access to customer data, which will enable them to create more personalized products and services. The platform will also enable insurers to streamline their processes and reduce their costs.

Thirdly, open insurance will create new opportunities for third-party service providers. These providers can use the platform to offer new products and services to customers. For example, a fitness company could offer a personalized fitness plan to a health insurance customer.

Open insurance also presents some challenges and opportunities for insurers and customers. One of the biggest challenges is data security and privacy. The platform must ensure that customer data is protected and used only for its intended purpose (Figure 2).




Source: (Infintech, 2020)

**Figure 2. Open data in the insurance industry**

Another challenge is the need for standardization. The platform must have a common set of standards and protocols to ensure interoperability between different systems.

However, open insurance also presents several opportunities for insurers and customers. Insurers can use the platform to create new revenue streams by offering new products and services. Customers can access a wider range of products and services that are tailored to their specific needs (EY, 2022).

The Application Programming Interface (API) has been used in the insurance industry for some time, and recently, this approach has been adopted outside of insurance companies, precisely to achieve the goal of offering better quality products and services to specific consumers. These new approaches are also creating the foundation for increased competition.

Open insurance ecosystems represent an important opportunity for transforming the insurance industry, but they require appropriate technological and regulatory solutions to ensure their long-term success (Danaconnect, 2023).

## 2. RISKS AND CHALLENGES OF OPEN INSURANCE FOR CONSUMERS, REGULATORS, AND THE INDUSTRY

By creating a digital platform that connects insurers, customers, and third-party service providers, open insurance enables data and services to be shared more efficiently, resulting in greater customer satisfaction and more personalized products and services. However, this new approach also comes with risks and challenges that need to be addressed. In this article, we will explore the risks and challenges of open insurance for consumers, regulators, and the industry.

*a) Risks for Consumers*

One of the main risks for consumers in open insurance is the security of their data. Open insurance involves the sharing of personal data among different parties, and this creates the potential for data breaches and cyber-attacks. Consumers need to be assured that their personal information is being protected and that appropriate security measures are in place. Another risk for consumers is the potential for discrimination. By using data from various sources, insurers can create more accurate risk assessments, but this can also lead to discriminatory practices. For example, an insurer may use data from a customer's social media accounts to assess their risk profile, but this could result in unfair practices, such as charging higher premiums based on factors that are outside of the customer's control. Consumers also need to be assured that they have control over their data and that they can choose how their data is being used. Transparency and informed consent are essential to ensure that consumers have trust in the open insurance platform (Financialrights, 2020).

*b) Risks for Regulators*

Regulators face several challenges in the regulation of open insurance. One of the main challenges is the need to balance innovation and consumer protection. Regulators need to ensure that open insurance platforms are not compromising for consumer protection, but they also need to avoid stifling innovation. Another challenge regulators is the need for international harmonization. Open insurance involves the sharing of data across borders, and this creates challenges for regulators who need to ensure that data protection laws are being complied with.

Regulators also need to ensure that open insurance platforms are complying with anti-discrimination laws and that they are not perpetuating unfair practices. This requires a robust regulatory framework that can keep pace with the evolving nature of open insurance.

*c) Risks for the Industry*

Open insurance presents several challenges for the insurance industry. One of the main challenges is the need to adapt to the new digital landscape. Traditional insurers may struggle to keep up with the pace of technological change, and this could lead to a loss of market share.

Another challenge is the need to balance innovation with consumer protection. Insurers need to ensure that they are not compromising consumer protection in their pursuit of innovation. They also need to be transparent about how they are using customer data and ensure that customers have control over their data.

Insurers also face challenges in the area of liability. With the sharing of data among different parties, it can be difficult to determine who is liable in the event of a breach or cyber-attack. Insurers need to ensure that they have adequate insurance coverage and that they are complying with regulatory requirements.

To mitigate the risks and challenges of open insurance, several measures can be taken:

- Ensuring that appropriate security measures are in place to protect personal data.
- Being transparent about how customer data is being used and ensuring that customers have control over their data.
- Ensuring that anti-discrimination laws are being complied with and that unfair practices are not perpetuated.
- Developing a robust regulatory framework that can keep pace with the evolving nature of open insurance.
- Ensuring that insurers have adequate insurance coverage to mitigate liability risks.

## 3. THE ROLE OF FINANCIAL EDUCATION

Consumers must be prepared for new approaches and trends such as open insurance. Financial education plays a crucial role in helping consumers understand open insurance. By providing consumers with the knowledge and skills they need to make informed decisions, financial education can help consumers navigate the complex world of insurance.

Financial education can help consumers understand the aspects of open insurance. Also, financial education can help consumers understand the benefits of open insurance, including greater accessibility, more personalized products and services, and more efficient claims processing. Financial education can help consumers understand how open insurance works and how it differs from traditional insurance. This includes understanding the role of technology and data sharing in open insurance. At the same time, financial literacy can help consumers understand the importance of data privacy and security in open insurance, including how personal data is collected, used, and protected. Elements such as consumer protection must be very well-known by consumers. In this respect, financial education can help consumers understand their rights and protections as insurance consumers, the role of regulators, and how to file a complaint if necessary, can provide information for consumers to understand the importance of anti-discrimination laws in open insurance, understand how data can be used to create more accurate risk assessments without perpetuating unfair practices.

## 4. OPEN INSURANCE IN THE CONTEXT OF FINANCIAL STABILITY

Open Insurance has the potential to affect financial stability in several ways. On the one hand, it could improve the efficiency and effectiveness of the insurance industry, leading to more stable and sustainable business practices. On the other hand, it could introduce new risks and challenges that could threaten financial stability. One way that open insurance could affect financial stability is by creating new systemic risks. By allowing insurers to access and use more data, open insurance could lead to increased interconnectedness and concentration within the insurance industry. This could make the industry more vulnerable to systemic shocks, such as cyber-attacks or natural disasters. In addition, open insurance could introduce new risks related to data privacy and security. As insurers collect and use more data, they may be more susceptible to data breaches or other security threats. This could lead to reputational damage, financial losses, and a loss of customer trust.

Furthermore, open insurance could create new challenges for regulators. Regulators will need to ensure that open insurance is conducted safely and soundly and that consumers are protected from potential risks. This may require new regulations or oversight mechanisms, which could increase regulatory compliance costs for insurers and other industry participants. While open insurance has the potential to improve the efficiency and effectiveness of the insurance industry, it could also introduce new risks and challenges that could threaten financial stability. To mitigate these risks, it will be important for regulators and industry participants to work together to ensure that open insurance is conducted safely and soundly and that consumers are protected from potential risks.

As open insurance continues to grow in popularity, there is a need for new regulations to ensure that consumers are protected and that the industry operates safely and soundly. The European Insurance and Occupational Pensions Authority (EIOPA) has taken a proactive approach to this issue and has developed a set of guidelines and recommendations for open insurance.

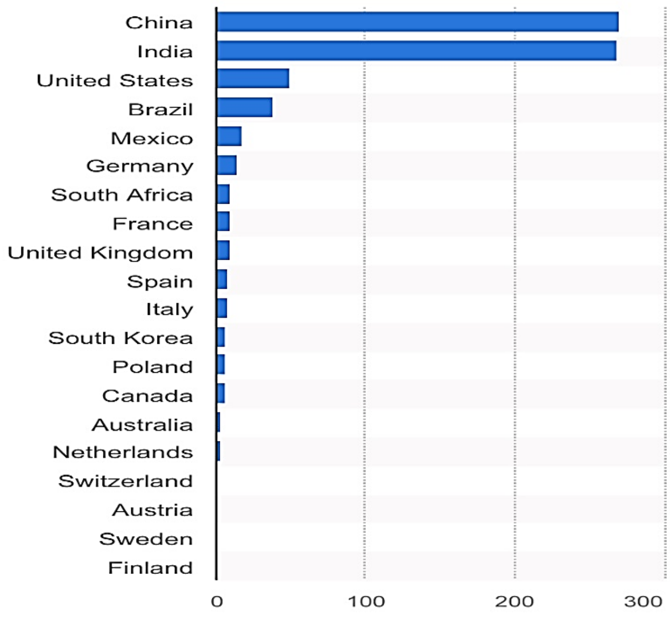
In its InsurTech Report, EIOPA recognized the potential benefits of open insurance, such as increased competition and innovation, as well as the potential risks, such as privacy and security concerns. In response, it developed a set of principles for the development of open insurance, including:

- Open insurance should be developed in a way that ensures the security and privacy of consumer's data;
- Open insurance should be designed to protect consumers and ensure that they are fully informed about the products and services they are purchasing;
- Open insurance should promote innovation in the industry and provide consumers with access to new and innovative products and services;
- Open insurance should be designed to promote interoperability between different products and services, allowing consumers to seamlessly switch between providers;
- Open insurance should promote fair competition and a level playing field for all market participants.

To implement these principles, EIOPA has recommended several specific measures, including:

- The development of standardized APIs and data formats to ensure interoperability and data portability;
- The establishment of common data governance principles and data access rights for insurers, consumers, and other stakeholders;
- The adoption of best practices for data security and privacy, such as data encryption and access control;
- The development of guidelines for the use of new technologies, such as artificial intelligence and machine learning;
- The establishment of a regulatory sandbox to encourage experimentation and innovation in the industry.

EIOPA's approach to open insurance regulation emphasizes the need for consumer protection, innovation, and fair competition, while also recognizing the potential risks and challenges associated with this new approach to insurance. By implementing these guidelines and recommendations, EIOPA aims to ensure that open insurance is developed safely and soundly and that consumers are protected and empowered in the process. Taking into account the recommendations of EIOPA, EU member states will align with the new approaches to achieve objectives in the European insurance market (Figure 3).




Source: (Statista, 2023)

**Figure 3. Number of potential open insurance users worldwide in 2022, by country**

## 5. CONCLUSIONS

Open Insurance is a promising concept that can potentially revolutionize the insurance industry by leveraging technology and data to create more personalized and customer-centric products and services. However, there are still several challenges that need to be addressed before it can reach its full potential. One of the biggest barriers to the adoption of Open Insurance is the lack of standardization and interoperability among different systems and platforms. This makes it difficult for insurers to share data and collaborate effectively, which limits the scope of innovation and hinders the development of new business models. Another challenge is the need for robust security and privacy frameworks to protect sensitive customer information. As insurers collect more data about their customers, they must ensure that they are complying with relevant regulations and implementing best practices to prevent data breaches and other cyber threats.

In the end, there is also a cultural barrier to the adoption of Open Insurance, as many insurers are still entrenched in traditional business models and may be resistant to change. To overcome this, there needs to be a concerted effort to educate and train insurance professionals on the benefits of Open Insurance and how it can help them better serve their customers. In the same context, financial education can play a crucial role in the adoption of Open Insurance by consumers, as well as in promoting this approach in the insurance industry, by understanding the benefits, increasing trust in data protection, improving competencies including digital skills related to insurance services, but also by helping insurance companies better communicate their values and explain to consumers how Open Insurance can contribute to improving their experience.

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# CHALLENGES OF EU MONETARY POLICY AND MONETARY CONVERGENCE

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**Abstract**
*The conditions of the COVID-19 pandemic have affected the changes in the circumstances of people's lives and work around all the world. In addition to numerous measures to combat the pandemic, national economies used instruments within the framework of economic, fiscal, monetary and financial policy. The European Central Bank (ECB) has introduced collateral mitigation programs and measures for Euro system credit operations, banking supervision and new rules on capital composition. Candidate countries for EU accession continued with further monetary convergence. The Republic of Serbia, as a candidate country, harmonizes monetary policy by harmonizing the strategies, instruments and transmission mechanisms of the National Bank of Serbia (NBS) and the ECB, and aligns the national legislation with the primary and secondary legislation of the EU. The Report of the European Commission (EC) on the achieved progress in the EU accession process contains an analysis of the progress within the monetary policy in Chapter 17-Economic and monetary policy.*
*The objectives of the research in the paper are:*
*1. Review and analysis of monetary policy measures in EU countries in the conditions of the COVID-19 pandemic based on IMF Tracker indicators,*
*2. Monetary policy measures in the RS in the conditions of the COVID-19 pandemic and*
*3. Analysis of monetary convergence based on the Report EC from the aspect of legislative alignment, price stability and monetary financing.*
*The paper points to the development of monetary policy measures in the conditions of the COVID-19 pandemic and the effectiveness of the response to the resulting situation, the willingness of the ECB to change the appropriate operating conditions through the management of the stability of the banking system, with the aim of preserving the stability of the monetary system, as well as, Serbia's need for further convergence in the process of EU accession in accordance with EC recommendations.*
**Keywords:** *monetary policy; accession; EU; COVID-19.*
**JEL Classification:** E52, E58, F00

## 1. INTRODUCTION

Strong monetary and fiscal stimuli in a large number of countries affected the negative effects of the COVID-19 pandemic, which worsened the epidemiological situation. This reaction of national economies relaxed the difficult business conditions of companies and changed consumer habits. The pandemic has emphasised the urgent need to address the problems that are affecting people's well-being because the UN estimates that the number of people living in poverty worldwide will increase by between 40 and 60 million as a result of the pandemic, undoing the progress made in recent years (ECB, 2021).

The impact of the pandemic and the ensuing disruptions to global value chains on exporting firms show that participation in global value chains increased firms' vulnerability to the pandemic shock. Exporting firms benefited from sourcing their core inputs from different countries because diversification in global value chains fosters supply chain resilience (Lebastard and Serafini, 2023).

Since the outbreak of the financial crisis, the ECB and other major central banks have implemented measures beyond their standard toolkit: full-allotment loans with fixed rates, an expansion of the list of assets eligible as collateral and longer-term liquidity provisions in the euro and other currencies, changed the reserve ratio required, implemented outright purchases of specific securities, modified interest rate corridors and introduced new communication tools (Rodríguez and Carrasco, 2016).

The ECB's expansionary monetary policy has stabilized the European economic and financial system by creating short-term fiscal capacity at the national level and by incentivizing banks' lending to households and businesses.

The monetary policy roadmap has been complemented by the decisions taken by the European and international regulatory and supervisory authorities and they have temporarily eased some prudential and accounting rules, as well as, a number of supervisory requirements (Benigno *et al.*, 2021).

The Republic of Serbia, in addition to obligations related to the integration process, applied additional monetary policy measures during the pandemic. Thus, in accordance with the Monetary Policy Program, the NBS tried to reduce the effects of the pandemic. From the aspect of the integration process, progress can be seen in the area of monetary policy with the need to more effectively fulfill the recommendations from the years preceding the pandemic.

## 2. ANALYSIS OF THE MONETARY POLICY MEASURES IN EU COUNTRIES IN THE CONDITIONS OF COVID-19 PANDEMIC

### 2.1. The main monetary policy measures in the EU countries as a response to the COVID-19 pandemic

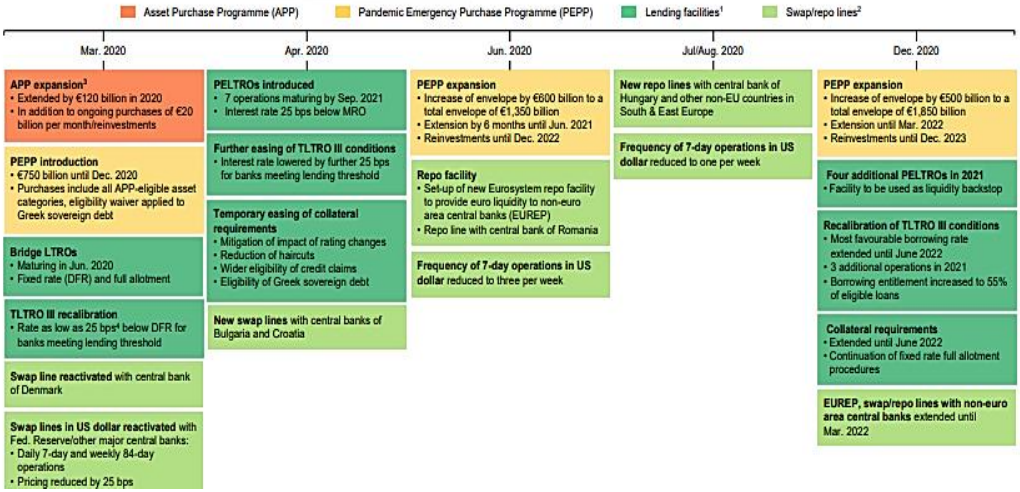
ECB's Governing Council took the main monetary policy address the economic fallout of the first wave of the COVID-19 pandemic during its regular meetings on 12 March 2020, 30 April 2020, and 4 June 2020 (Figure 1), as well as an extraordinary meeting on 18 March 2020 (European Parliament, 2021).

The ECB's response consists of three measures during the pandemic:

1. Pandemic emergency purchase program (PEPP) and new expanded APP,
2. Lending to the real sector (LTRO, s, TLTRO III. PLTRO),

3. Lender of last resort to solvent banks and

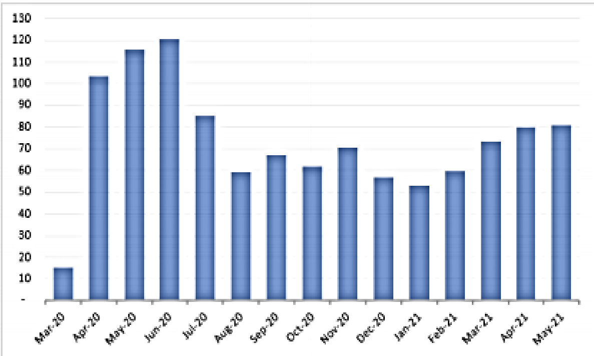
4. The new pandemic emergency purchase programme (PEPP) was introduced and subsequently increased to EUR 1.85 trillion and extended until March 2022 (ECB, 2020a).




Source: (Schnabel, 2020)

**Figure 1. Timeline of ECB policy measures during the pandemic**

Between March 2020 and May 2021, the Eurosystem conducted EUR 1.1 trillion net asset purchases under the PEPP. The public sector component of the PEPP purchases in that period amounted to EUR 1.06 trillion (96.4% of total purchases) (ECB, 2020b) (Figure 2).




Source: (ECB, 2020b)

**Figure 2. PEPP: net asset purchases by month, March 2020 - May 2021 (EUR billion)**

At the beginning of the pandemic, the ECB provided monetary policy support through additional asset purchases of 120 billion euros until the end of 2020 under the existing program (APP), a temporary liquidity instrument with a fixed rate, where interest rates can go up to 50 basis points below the average line deposit rates (TLTRO III), a liquidity instrument consisting of a series of long-term refinancing operations in emergency pandemic situations carried out with an interest rate that is 25 basis points below the average MRO rate (PELTRO) (ECB, 2020b).

In June 2020, the ECB announced measures to mitigate collateral for Eurosystem credit operations (MROs, LTROs, TLTROs). These measures include a permanent 20 percent collateral reduction for non-marketable assets and temporary measures for the duration of the PEPP. In addition, the ECB established the Eurosystem's Repo Facility for Central Banks (EUREP) to provide precautionary repo facilities to central banks outside the eurozone, complementing existing bilateral swap and repo facilities. EUREP has been extended until March 2022 to deal with possible liquidity needs in euros in the event of market dysfunction.

In December 2020, the ECB extended the duration and scope of several monetary policy instruments:

- increasing the Pandemic Purchase Program (PEPP) by EUR 500 billion to EUR 1,850 billion and extending its duration by nine months at least until the end of March 2022 (from June 2021);
- changing the conditions of targeted long-term refinancing operations (TLTRO III), including the extension of the period in which banks can provide favorable conditions until June 2022;
- increasing the borrowing limit and announcing three additional operations that will be carried out between June and December 2021;
- extension of collateral mitigation measures from April 2020 to June 2022
- announcing four additional pandemic emergency long-term refinancing operations (PLTROs) in 2021 to act as a liquidity backstop.

Troughout the pandemic period, the key interest rates remained unchanged:

- Main refinancing operations (MRO): 0.00% (since March 2016),
- Marginal lending facility: 0.25% (since March 2016), and
- Deposit facility: -0.50% (since September 2019) (European Parliament, 2021).

On 12 March 2020, the Governing Council has decided to conduct additional LTROs on a temporary basis under a fixed-rate full allotment procedure, providing banks with liquidity and acting as a backstop to any deterioration of money market conditions with 13 such additional LTRO operations were conducted between 18 March and 10 June 2020, all maturing on 24 June 2020, providing EUR 388.9 billion of liquidity to the euro area financial system (Table 1).

**Table 1. LTRO - additional operations conducted (12 March decision)**

| Settlement date | Maturity date | Allotted amount | Settlement date |
|---|---|---|---|
| 18 March 2020 | 24 June 2020 | 109.13 | 110 |
| 25 March 2020 | 24 June 2020 | 79.67 | 180 |
| 1 April 2020 | 24 June 2020 | 43.71 | 107 |
| 8 April 2020 | 24 June 2020 | 19.51 | 99 |
| 15 April 2020 | 24 June 2020 | 4.64 | 53 |
| 22 April 2020 | 24 June 2020 | 18.91 | 82 |
| 29 April 2020 | 24 June 2020 | 36.66 | 74 |
| 6 May 2020 | 24 June 2020 | 14.28 | 62 |
| 13 May 2020 | 24 June 2020 | 6.82 | 52 |
| 20 May 2020 | 24 June 2020 | 8.73 | 47 |
| 27 May 2020 | 24 June 2020 | 18.54 | 40 |
| 3 June 2020 | 24 June 2020 | 14.48 | 30 |
| 10 June 2020 | 24 June 2020 | 13.77 | 24 |

Source: (ECB, 2020b)

The 24 June 2020 TLTRO III operation was the largest liquidity operation in the history of the ECB with an allotted amount of EUR 1.3 trillion (Table 2).

**Table 2. TLTRO III indicative schedule of operations**

| Settlement date | Maturity date | Allotted amount | Setlement date |
|---|---|---|---|
| 25 September 2019 | 28 September 2019 | 3.4 | 28 |
| 18 December 2019 | 21 December 2022 | 97.72 | 122 |
| 25 March 2020 | 29 March 2023 | 114.98 | 114 |
| 24 June 2020 | 28 June 2023 | 1,308.43 | 742 |
| 30 September 2020 | 27 September 2023 | 174.46 | 388 |
| 16 December 2020 | 20 December 2023 | 50.41 | 156 |
| 24 March 2021 | 27 March 2024 | 330.5 | 425 |

Source: (ECB, 2020b)

Swap lines are arrangements between central banks to exchange currency in order to maintain foreign currency liquidity when markets are distorted. Repo lines are used to provide euro liquidity to non-euro area central banks in exchange for euro-denominated collateral. Swap lines are used by the ECB to exchange euros against other currencies. On 25 June 2020, the ECB set up the Eurosystem repo facility for central banks (EUREP) to complement existing swap and repo lines by providing euro liquidity to non-euro area central banks against collateral, consisting of euro-denominated marketable debt securities issued by euro area governments and supranational institutions (Table 3).

**Table 3. Repo and swap lines established to provide euro liquidity support**

| Repo/swap | Start date | Country | Size of repo/swap line (billion) |
|---|---|---|---|
| Repo | 5 June 2020 | Romania | 4.5 |
| | 17 July 2020 | Serbia | 1 |
| | 17 July 2020 | Albania | 0.4 |
| | 23 July 2020 | Hungary | 4 |
| | 18 August 2020 | North Macedonia | 0.4 |
| | 18 August 2020 | San Marino | 0.1 |
| Swap | 20 March 2020 | Denmark | 24 |
| | 15 April 2020 | Croatia | 2 |
| | 22 April 2020 | Bulgaria | 2 |

Source: (ECB, 2020b)

### 2.2. Macroprudential measures in the EU countries

Central banks of EU countries apply measures within the framework of macroprudential policy (IMF, 2023). The Banco de Portugal (BdP) has relaxed some aspects of its macroprudential measures for consumer credit and postponed the phase-in period of the capital buffers. The BdP has announced a series of measures directed to less significant banks under its supervision, in line with the initiatives undertaken by the ECB and the EBA: the possibility to temporary operate below selected capital and liquidity requirements, a recommendation to restrict dividend distributions, an extension of deadlines of some reporting obligations, and rescheduling of on-site inspections and the stress test exercise.

Measures announced by Central Bank of Ireland (CBI) include: the release of the countercyclical capital buffer which will be reduced from 1% to 0%, payment breaks available for mortgages, personal and business loans for customers affected by COVID-19 that were extended from three to six months.

The Norway easing of countercyclical capital buffer by 1.5 percentage points, the possibility that banks can temporarily breach the liquidity coverage ratio and temporary easing of mortgage regulations,

The Danmarks Nationalbank increased the policy rate by 15bps to -0.6 percent. The standing swap line with ECB was activated and its size was doubled to EUR 24 billion. the DN reached an agreement with the Federal Reserve to establish a USD 30 billion swap line that will stand for at least 6 months. Measures taken by the Belgian authorities include: a reduction in the counter-cyclical bank capital buffer to 0 percent, retracting an increase to 0.5 percent that was supposed to become effective in June, while providing forward guidance of no change until at least through the first quarter of 2022 and a suspension of debt servicing to banks and insurers by households and companies affected by the crisis until end-June 2021.

Sweden the establishment of a swap facility of USD 60 billion between the Riksbank and the US Federal Reserve (mutual currency arrangement), the possibility for banks to borrow in US dollars against collateral of up to USD 60 billion, easing rules for the use of covered bonds as collateral and temporarily recognizing that all credit institutions under the supervision of the Swedish FSA can apply to become temporary monetary policy counterparties, and given that they are accepted as a temporary monetary policy counterparty, enabling them to access the new Funding for lending facility.

The National Bank of Poland (NBP) reduced its policy interest rate by 140 bps to 10 bps, with rate cuts on May 28 (40 bps). The NBP has provided liquidity to banks, reduced the required reserve ratio from 3.5 to 0.5 percent, and changed the interest rate on required reserves to the level equal to the policy interest rate.

The Bank of Lithuania has lowered its counter-cyclical capital buffer from 1 to 0 percent and has encouraged banks to be flexible and negotiate, on a case-by-case basis, loan terms with borrowers if necessary.

The Bank of Spain was apply to the banks it supervises the flexibility provided by the legal system in relation to the setting of transition periods and the intermediate minimum requirements for own funds and eligible liabilities (MREL) targets.

CB Norway has reduced of the policy rate by 1.5 percentage points to 0.0 percent, the establishment of a swap facility of USD 30 billion between Norges Bank and the US Federal Reserve (mutual currency arrangement) and the expansion of banks' ability to borrow in USD dollars against collateral.

The Bulgaria National Bank has implemented the following measures÷ capitalization of the profit in the banking system, increase in liquidity of the banking system (6 percent of 2019 GDP) by reducing foreign exposures of commercial banks, cancellation of the increase of the countercyclical capital buffer about 0.6 percent of 2019 GDP, agreement on a moratorium on bank loan payments for up to 6 months. Also, the Bank establishment of EUR 2 billion swap line with the ECB until end-2020 with the maximum maturity of 3 months for each drawing.

The Croatian National Bank (CNB) has provided additional liquidity via: the structural repo facility, regular weekly repos (repo rate has been reduced from 0.30 to 0.05 percent) and a reduction of the reserve requirement ratio (from 12 to 9 percent). The European Central Bank and the CNB have agreed on a €2 billion swap line.

The Central Bank of Cyprus (CBC) announced additional measures on March 18th and they include a release of capital and liquidity buffers for banks directly supervised by the CBC (€100 million), simplification of documentation requirements for new short-term loans and other credit facilities, encouraging banks to apply favorable interest rates for new loans and newly restructured loans, and simplification of approval processes for loan restructuring and other measures.

The Czech National Bank (CNB) lowered the policy rate by 50 bps on to 0.25 percent. The countercyclical capital buffer rate was initially reduced by 75bps to 1 percent effective July 2022. On June 23, 2021, the CNB increased the policy rate by 25 basis points to 0.50 percent.

The Danmarks Nationalbank (DN) increased the policy rate by 15bps to 0.6 percent. The standing swap line with ECB was activated and its size was doubled to EUR 24 billion. The DN reached an agreement with the Federal Reserve to establish a USD 30 billion swap line that will stand for at least 6 months. The DN also increased the interest rate on the previously announced 1-week loans to -0.35 percent. The Danish authorities decided on March 12, 2020 to preemptively release the countercyclical capital buffer and cancel the planned increases meant to take effect later.

Measures taken by the Belgian authorities include: a reduction in the counter-cyclical bank capital buffer to 0 percent, retracting an increase to 0.5 percent, a ban on the short-selling of stocks and a suspension of debt servicing to banks by households and companies.

The Eesti Bank in Estonia reduced the systemic risk buffer for the commercial banks from 1 percent to 0 percent on March 25, 2020 to free up resources for loan losses or new loans. The measure is expected to free up about €110 million for the banks. The Eesti Bank, also, announced that it will allocate ¾ of its 2019 profits equivalent to €18.9 million and the maximum amount possible to support the state budget in the wake of COVID-19.

Bank of Finland supported liquidity by purchasing short-term Finnish corporate commercial paper (€1 billion), 1 ppt reduction in the structural buffer requirements of all credit institutions by removing the systemic risk buffer and adjusting institution-specific requirements, Finland's Export Credit Agency expanded its lending and guarantee capacity to SMEs by €10 billion to €12 billion the State Pension Fund purchased commercial paper (€1 billion) and other measures. On June 29, 2020 Finland's Financial Supervisory Authority (FIN-FSA) relaxed to 90 percent the macroprudential limit on loan-to-collateral ratios for residential mortgages.

France supported liquidity by reducing the counter-cyclical bank capital buffer to 0 percent (an increase from 0.25 percent to 0.5 percent was to become effective by April), a temporary ban on short-selling stocks was place until May 18, 2020 and (iii) credit mediation to support renegotiation of SMEs' bank loans.

German banks supported liquidity by release of the countercyclical capital buffer for banks from 0.25 percent to zero, additional €100 billion to refinance expanded short-term liquidity provision to companies through the public development bank KfW, in partnership with commercial banks and other measures.

The National bank of Slovakia (NBS) has implemented the measures as part of a coordinated approach with the ECB and the EBA: banks may partially meet

Pillar 2 requirements using capital instruments that do not qualify as common equity tier 1 (CET1) capital, banks may, in duly justified cases, temporarily operate below the level of capital defined by the capital conservation buffer.

Romania banks supported liquidity by reducing the monetary policy rate by 1.25 percentage point to 1.25 percent, narrowing the corridor defined by interest rates on standing facilities around the monetary policy rate to ±0.5 percentage points from ±1.0 percentage points, providing liquidity to credit institutions via repo transactions and purchasing government securities on the secondary market. The repo transactions stand at around RON 42 billion in 2020 and 2 billion RON in 2021. The European Central Bank has set up a euro repo line with Romania's central bank worth a maximum of €4.5 billion ($5.1 billion).

### 2.3 Other monetary policy measures in EU countries in pandemic COVID-19 conditions

The analysis of other monetary policy measures adopted by EU countries during the COVID-19 pandemic was done on the basis of the IMF Policy Tracker indicator, which was compiled on the basis of data from the national banking systems of EU countries. Other measures can be grouped into several categories:

**1.** Provision of additional liquidity

The Bank of Slovenia (BoS) extended all ECB measures to all banks and savings banks in Slovenia. The BoS restricted profit distribution at banks, reduced the maximum level of allowed bank account fees, with higher reduction for the more disadvantaged groups allowed banks to temporarily exclude income declines caused by the epidemic when calculating creditworthiness.

The Croatian National Bank (CNB) supported the government securities market, and temporarily eased the regulatory burden on banks via: the structural repo facility, regular weekly repos used by banks and a reduction of the reserve requirement ratio.

The Bulgaria government has put forward liquidity support measures, utilizing national and EU resources, capital increase of the state-owned Bulgarian Development Bank, to be used for the issuance of portfolio guarantees to commercial banks for the extension of corporate loans and to provide interest-free loans to employees on unpaid leave, self-employed, and seasonal workers.

Romania providing liquidity to credit institutions via repo transactions (repurchase transactions in government securities), purchasing government securities on the secondary market and operational measures to ensure the smooth functioning of payment and settlement systems.

Norway reduction of the policy rate by 1.5 percentage points to 0.0 percent (NB has signaled its intent to hike rates later this year), provision of additional liquidity to banks in form of loans of differing maturities, the establishment of a swap facility of USD 30 billion between Norges Bank and the US Federal Reserve (mutual currency arrangement) and (iv) the expansion of banks' ability to borrow in USD dollars against collateral.

**2.** State guarantees

The government of Spain has extended up government guarantees for firms and self-employed, covering both loans and commercial paper. The government launched a new Instituto de Crédito Oficial line of guarantees to promote investment activities, guarantees for loan maturity extensions to farmers, a line of guarantees to provide financial assistance on housing expenses for vulnerable households.

The program which EC approved Croatia'a provides for the issuance of a state guarantee in the amount of 100% of the loan principal for micro, small and medium-sized enterprises and up to 90% for large enterprises. The new loans are intended for working capital and investments, as well as, interest rate subsidies.

A Guarantee Fund has been allocated by Government, through the Malta Development Bank, for the purpose of guaranteeing loans granted by commercial banks in Malta to businesses affected negatively by the pandemic.

The authorities in the Slovenia created a public guarantee amounting to € 2.2 billion to cover loans extended to non-banking corporations to facilitate access to lending.

The EC approved Croatia's HRK 1.53 billion state aid program for companies in the field of tourism and sports. Other measures include additional funding for the ICO credit lines; guarantees for financing operations carried out by the European investment Bank; endorsement to the European SURE instrument; loans through the State Financial Fund for Tourism Competitiveness (FOCIT) to promote sustainability in the tourism sector; loans for the industrial sector to promote digital transformation and modernization.

**3.** Moratorium

EU countries are introducing a moratorium on loan payments and other reliefs that allow businesses and individuals to pay off their obligations. Thus, the moratorium implemented in Spain covers a wide range of measures÷ moratorium on non-mortgage loans and credits, including consumer credits, for the most vulnerable, deferred repayment of loans granted to businesses by the Ministry of Industry, Trade, and Tourism and suspension of interest and repayment of loans granted by the Secretariat of State for Tourism for one year with no need for prior reques. Moratorium measures related to the population include÷ mortgage payments for the most vulnerable, including households, self-employed and homeowners who have rented out their mortgaged properties and moratorium or reduction of rent payments for vulnerable tenants whose landlord is a large public or private housing holder mortgage payments for the most vulnerable, including households, self-employed and homeowners. Other measures within the framework of the moratorium include ÷ deferral of payments on certain loans granted by the Institute for the Diversification and Saving of Energy, adoption of a mechanism for renegotiation and deferment of business premises rent, reduced notary fees for renovation of non-mortgage loans and other measures.

The governments and central banks of other EU countries are introducing moratorium measures.

The Slovenia National Assembly adopted a Law allowing the deferral of loan payments for at least 12 months on capital and interest coming due and covering businesses and part of households facing liquidity problems attributed to the COVID-19 epidemic.

The Romania Government has issued legislation that banks will defer loan repayments for households and businesses affected by COVID-19 for up to nine months applicable until March 2021.

Luxembourg banks committed to offer a 6-month moratorium on loan repayment for SMEs, self-employed and liberal professionals. The Slovenia National Assembly adopted a Law allowing the deferral of loan payments for at least 12 months on capital and interest coming due and covering businesses and part of households facing liquidity problems attributed to the COVID-19 epidemic. The Central Bank of Cyprus announced additional measures which include a release of capital and liquidity buffers for banks directly supervised by the CBC, simplification of documentation requirements for new short-term loans and other credit facilities.

The Portuguese government has approved a moratorium on bank loan repayments for households and companies affected by the coronavirus outbreak which has been extended until end-September 2021.

Dutch banks grant SMEs a six-month postponement of their loan repayments and to protect homeowners, the government and relevant stakeholders agreed that there will be no mortgage foreclosures until July 1 2020.

The Croatian Banking Association has agreed to defer repayment of loans to the tourism sector until end-June 2021. The Croatian Bank for Reconstruction and Development has issued a moratorium on debt service for three months, can provide liquidity loans, export guarantees, and restructure obligations.

The Polish Banking Association has recommended voluntary deferral of loan payments for affected borrowers for up to three months. Banks have also increased limits for contactless credit cards.

Management companies and insurance undertakings which are facing temporary liquidity problems mogla su da se obrate to the Bank of Lithuania for emergency liquidity assistance in the form of loans provided at the European Central Bank’s Marginal Lending Facility rate.

A moratorium for three months on obligations to banks has been introduced by Croatian National Bank.

The Parliament of Cyprus passed a bill on March 29, 2020, providing a general moratorium on loan repayments for all creditworthy borrowers until end-December 2020. This moratorium was further extended to June 2021.

A Guarantee Fund has been allocated by Government, through the Malta Development Bank, for the purpose of guaranteeing loans granted by commercial banks in Malta to businesses affected negatively by the pandemic. Banks were directed to offer a six-month moratorium on repayments on capital and interest for borrowers who have been negatively affected by COVID-19.

**4.** Other measures

The Bank of Spain will apply to the banks it supervises the flexibility provided by the legal system in relation to the setting of transition periods and the intermediate minimum requirements for own funds and eligible liabilities targets.

The Central Bank of Cyprus announced additional measures which include a release of capital and liquidity buffers for banks directly supervised by the CBC, simplification of documentation requirements for new short-term loans and other credit facilities, encouraging banks to apply favorable interest rates for new loans and newly restructured loans.

## 3. MONETARY POLICY IN RS DURING THE PANDEMIC

Since March 2020, as in other European countries, economic activity in Serbia has been affected by the corona virus pandemic, which has affected significant monetary and fiscal incentives from the National Bank of Serbia and the Government of the Republic of Serbia to support the economy in overcoming the negative effects of the pandemic. At the extraordinary session on March 11, the Executive Board of the National Bank of Serbia made a decision to reduce the reference interest rate by 50 basis points, to 1.75%, and the corridor of basic interest rates was also narrowed, from ± 1.25% to ± 1 .0%. At the sessions in April and June, the reference interest rate was lowered by 25 basis points each, to 1.25%. The National Bank of Serbia, also, undertook additional measures to support the real sector - dinar and foreign currency liquidity to banks, through direct repo operations, swap auctions and bilateral purchases of dinar government securities from banks (NBS, 2020).

The NBS implements the Monetary Policy Program, according to which in 2021 the necessary flexibility of the monetary policy regarding the use of instruments is to be maintained in order to preserve the appropriate level of banks' liquidity and to provide support for economic recovery from the negative effects of the pandemic (NBS, 2021a). The monetary policy program, which was adopted in December 2021, predicted that the National Bank of Serbia would remain committed to achieving price stability in the medium term. The level of the reference interest rate was kept at an unchanged level of 1.0%, which has been the lowest level of the reference interest rate in the inflation targeting regime since

December 2020 and by 1.25 p.p. lower level than before the pandemic (NBS, 2021b).

The main operations on the open market of the National Bank of Serbia during 2021 were one-week reverse repo transactions, i.e. repo transactions selling HoV (liquidity withdrawal). Repo transactions were carried out by the National Bank of Serbia through its HoV. 26 HoV repo auctions were organized. Auctions are organized once a week, according to the variable multiple interest rate model. Total sales of HoV amounted to 1,086.0 billion dinars.

The reference interest rate of the National Bank of Serbia was kept at the level of 1.00%, and the interest rates on credit and deposit facilities at the level of 1.90% and 0.10%, respectively.

Monetary policy since the beginning of 2022 was conducted in accordance with the Monetary Policy Program of the National Bank of Serbia in 2022 and contributed to the preservation of macroeconomic and financial stability in conditions of strong shocks from the international environment, primarily geopolitical tensions due to the conflict in Ukraine. The National Bank of Serbia has continued to tighten monetary conditions since the beginning of 2022. The Executive Board kept the reference rate at an unchanged level of 1.0%, as well as interest rates on deposits (0.10%) and credit facilities (1.90%) (NBS, 2022).

Limited progress in the coordination of economic and monetary policy has been achieved especially due to the context of the introduction of measures to mitigate the effects of the COVID-19 pandemic (EK, 2021). In response to the pandemic, economic as well as monetary policy had to be adjusted, by taking appropriate measures immediately after the beginning of the crisis. In March 2020, the NBS reduced the reference rate from 2.25% to 1.75%, then in April to 1.5%, in June to 1.25% and in December to 1%. In addition, it narrowed the corridor of interest rates from 1.25 pp to 1 pp in relation to the reference rate. The liquidity of the banking sector was strengthened through additional EUR/RSD swap auctions and repo purchases, direct purchases of dinar government securities and reduction of foreign exchange swap interest rates. The NBS introduced a three-month moratorium on all repayments for bank loans and financial leasing contracts. The NBS also adopted a new set of temporary measures until 2021, which should enable individuals to have easier access to housing loans. In addition, the NBS adopted new measures to support debtors (businesses and individuals) affected by the pandemic. These measures provide for the reprogramming and refinancing of bank loans and a grace period of six months with an extension of the repayment term.

## 4. MONETRY CONVERGENCE IN THE REPUBLIC OF SERBIA

The Republic of Serbia has the status of a candidate in the process of European integration. In order to monitor the progress in this process, since March 2002, the European Commission has been submitting Report on the progress achieved by the countries of the Western Balkans. Progress is measured on the basis of decisions made, laws adopted and implemented measures. The first Report, which refers only to the Republic of Serbia, was published in 2006 and covers the period from October 1, 2005 to September 30, 2006. From the aspect of monetary policy implementation, price stability is the main goal of the National Bank of Serbia (NBS) and is in line with the primary goal of the European System of Central Banks.

In addition, EU rules require the independence of central banks and prohibit them from directly financing the public sector. Monetary financing of the public sector is prohibited by the law on the central bank. This law establishes that price stability is the primary objective of the central bank.

In the first Report, the EC states that the monetary policy in Serbia is exposed to the challenges of a large inflow of capital and the appreciation of the domestic currency. In addition, the NBS strengthened its regulatory and supervisory activities. A new banking law was adopted, which aligns current activities with the Basic Basel Principles. However, the Report notes slow progress in the implementation of the development monitoring plan (EK, 2006). The new monetary policy framework introduced in September 2006 aims at a gradual transition to inflation targeting with explicit targets for annual core inflation rates.

In the following year, the NBS intervened in the foreign exchange market in order to prevent excessive appreciation of the dinar. The NBS increased the sale of state and NBS bills, as the most important instrument of monetary policy in this period. The determination of the exchange rate was left to market forces, but the NBS exercised control and prevention of excessive daily fluctuations (EK, 2007).

In 2008, the NBS tightened administrative measures with the aim of reducing the use of the euro in the economy and simultaneously increasing the attractiveness of the dinar. The NBS limited its interventions on the interbank foreign exchange market to situations of excessive daily fluctuations (EK, 2008).

The monetary policy framework from 2006 was adjusted in January 2009, when the NBS switched from addressing core inflation to addressing retail price inflation. In an effort to encourage dinar liquidity and support the domestic economy, the NBS reduced the reference interest rate, however, inflation remained relatively high, due to large increases in regulated prices and constantly high inflationary expectations. The NBS intervened in the interbank market after a strong depreciation of the dinar (EK, 2009).

The NBS strove to preserve foreign exchange stability, carried out interventions on the interbank market, and with other disturbances where the depreciation of the dinar undermined the process of economic stabilization (EK, 2010 and 2011).

The independence of the NBS was called into restriction by the adoption of amendments to the Law on the NBS in the National Assembly in August 2012.

One of the changes violates the EU treaty, because it abolishes the right to judicial control in the case of dismissal of the governor (EK, 2012).

Amendments to the Law on the NBS were adopted with the aim of correcting certain amendments in August 2012, which threatened the Bank's independence. The NBS still applies a variable interest rate policy for the dinar, but this policy leads to exchange rate instability (EK, 2013).

The NBS continued its policy of inflation targeting in the range of 4%±1.5 percentage points. Inflation reached a historically low level, but remained below the target range of the NBS (EK, 2014).

In terms of monetary policy, in harmonizing the legal framework, the necessary progress was achieved in 2014. However, the inflation rate is below the tolerances of the central bank (4%±1.5 percentage points) (EK, 2015).

In the area of monetary policy, harmonization of the legal framework is at an advanced stage. Further harmonization is necessary to ensure the functional and institutional independence of the central bank (EK, 2016). The NBS reduced the volume of interventions on the open market. State reserves are kept at an appropriate level (EK, 2018).

Further efforts are needed to ensure the independence of the NBS and the prohibition of monetary financing in accordance with the EU acquis (EK, 2020).

Serbia is moderately prepared in the area of monetary policy (EK, 2022) (Table 4). Serbia has established a good institutional and administrative framework in the field of economic policy. Serbia needs to align the NBS legislation with the EU acquis in order to ensure its complete independence. Amendments to the Law on the NBS and the Law on Public Assets should ensure the independence of the NBS and prohibit monetary financing in accordance with the acquis of the EU (EK, 2021).

**Table 4. Preparedness of RS and progress in the field of monetary policy for EU accession**

| Preparedness monetary policy | Progress in the field | Recommendations for improvement |
|---|---|---|
| 2012<br>No progress | - | Amendments to the NBS Law call into question the independence of the central bank and represent a step back in alignment with the EU acquis |
| 2013<br>Moderate order | The issue of NBS independence was resolved by amendments to the law<br>There were no signs of political meddling | Ensuring the independence of the NBS |
| 2014<br>Moderate progress | The credibility of the monetary policy has improved | Implementation of the 2013 recommendations |
| 2015<br>Moderate progress | Some progress<br>Harmonization of the legal framework for bank independence | Stronger efforts to improve the coordination of economic policy, including the design and implementation of structural reforms |

| Preparedness monetary policy | Progress in the field | Recommendations for improvement |
|---|---|---|
| 2016<br>Moderately prepared | Good progress<br>Harmonization of the legal framework for bank independence | Further harmonization of the legal framework for the functional and institutional independence of the central bank |
| 2018<br>Moderately prepared | Some progress<br>Gradual relaxation of monetary policy | Further efforts are needed to ensure comprehensive functional and institutional independence of the NBS in accordance with the EU acquis |
| 2019<br>Moderately prepared | Some progress<br>Recommendations from 2018 were not implemented | Implementation of recommendations from 2018 |
| 2020<br>Moderately prepared | Partially implemented recommendations | Further harmonization of the NBS legislation with the EU acquis in order to ensure its full independence |
| 2021<br>Limited progress | Limited progress due to the context of the introduction of measures to mitigate the effects of the disease pandemic COVID-19<br>Recommendations from 2020 have not been implemented | Recommendations from last year's report<br>Further harmonization of the NBS legislation with the EU acquis in order to ensure its full independence |
| 2022<br>Moderately prepared | Limited progress<br>Recommendations from 2021 have not been implemented | Recommendations from last year's report<br>Further harmonization of the NBS legislation with the EU acquis |

Source: Author, based on EK (2012 to 2022)

## 5. CONCLUSIONS

In the international environment, monetary policy faces numerous challenges. The COVID-19 pandemic has changed people's living and working conditions, as well as, business operations. The ECB and the central banks of EU countries applied additional measures to maintain the liquidity of the banking sector and the economy. The applied measures are of different intensity, type and duration, but they have in common the effort to postpone obligations through a moratorium, maintain liquidity, reduce interest rates and more. The cooperation and assistance of the ECB is reflected in the implementation of a large number of programs intended to support countries affected by the pandemic.

Monetary policy was relaxed after the pandemic COVID-19 however, certain packages of measures are still in force. Serbia, which is a candidate for EU membership, in addition to the obligations related to joining the EU, supplemented the monetary policy measures thanks to the decisions of the NBS. Achieving price stability in the medium term will contribute to the stability of the financial system. However, the aggravation of geopolitical tensions and the outbreak of conflict in Ukraine imposes new challenges for economic policy, in order to ensure the continuity of economic growth.

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# FACTORS IMPACTING THE PUBLIC PROCUREMENT PROCESS

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**Abstract**
*Public Procurement (PP) is a vast field, encountered on a daily basis and directly affecting all citizens of a country through the outcomes of the processes carried out within it.*
*The duration and quality of the outcome of a public procurement process are two indicators that measure the performance of the system.*
*There is very little research in this area, so the study aims to complement this knowledge. Its results will be of use to managers, those who directly carry out public procurement and other researchers who wish to analyse the system.*
*Internal factors that influence the outcome of this process such as staff, the level of recognition of the procurement function, the level of planning, internal bureaucracy in correlation with the organisational mode are under the control of the contracting authority. External factors and in particular deficient legislation also have an important influence on the outcome.*
*Knowing the factors that influence these indicators, measures can be proposed to improve them in order to increase system performance.*
**Keywords:** *procurement; KPIs; performance; time; quality.*
**JEL Classification:** H57, H41

## 1. INTRODUCTION

Both in Romania and around the world, the public procurement system is one of the points of contact between companies and the public administration of each state and also the main instrument through which investment objectives can be achieved for the benefit of citizens and beyond.

The main issue for an organisation's management is when it comes to the time to benefit from the results of a public procurement process and especially whether the outcome of this process is the expected one. Most often, a question arises: how can the result of a public procurement process be delivered faster and at the expected level of quality.

The aim of this paper is ***to identify the factors impacting on the duration of*** a public procurement process ***and the quality of*** the outcome of the process.

The research aimed at conducting semi-structured interviews with practitioners in the field of Public Procurement to enable me, as a researcher, to identify as many factors as possible that may influence the duration of a public procurement process and those that may have an effect on the quality of the outcome of the procurement process. Although multiple experts in the field were contacted and initially agreed to participate, on the dates set for the interview they did not respond, thus resulting in a total of 8 interviewees.

Although there is not much research on this area, the few identified measure the level of performance of the field by reference to multiple indicators, among which we note ***time and quality*** (Bals, Laine and Mugurusi 2018; Patrucco *et al.*, 2019).

The results of the research are intended to be of real use both to the managers of organisations that carry out public procurement processes, to middle managers who directly manage public procurement structures in institutions, and to those who directly carry out public procurement in order to streamline their work and improve results.

The paper presents information about the subjects and their experience in the field of public procurement, the results of the interviews together with their analysis, and the conclusions of the research.

## 2. LITERATURE REVIEW

Romania's public procurement system is based on the European directives in this field, being in this point of view similar to the other public procurement systems in the other EU Member States, the European legislation - the 3 Directives 23, 24 and 25/EU of the European Parliament and of the Council of 26 February 2014 being transposed into national law by Laws 98 (on public procurement), 99 (on sectoral procurement) and 100 (on works concessions and service concessions) of 2016.

Public institutions, contrary to appearances, are also obliged to constantly adapt to legislative and political changes that affect them as much as private companies. Very often they too seek, under public pressure, to adopt new methods and more efficient approaches (McAdam, Walker and Hazlett, 2011; Iacovino, Barsanti and Cinquini, 2017). Public procurement structures are the first ones that have to adapt, first of all to (very frequent) legislative changes, to geo-political changes, to the creation of new Central Processing Unit (e.g. National Office for Centralised Procurement) that take over part of the tasks of internal procurement structures.

Through the Annual Procurement Strategy (mandatory in Romania above the threshold of 125 million lei/year budget, according to Article 11 of Government Decision no. 395/2016 and optional below this threshold) each institution should make its own analysis of the existing situation and future needs, thus being able to take the necessary decisions. The public institution must set its priorities in line with local/regional/national/European strategies. Often these constraints do not exist in the private sector.

Given the above, the Contingency Theory becomes very important; according to this theory, an organization's strategy should be reflected in its structure. The more correctly the structure is aligned with the strategy and the external context, the more its performance increases (Ginsberg and Venkatraman, 1985). This theory has also been found in other studies related to Procurement and Logistics Management (Barbara, Huo, and Zhao, 2010; Gianluca *et al.*, 2016; Cigdem and Anand, 2017).

In order to be able to adapt to all these changes, the management side needs to know the factors driving the change, and where it needs to go and thus be able to determine the changes that need to be implemented.

System performance is measured in the literature by reference to several Key Performance Indicators (KPIs): cost, **time, quality**, compliance, innovation, and sustainability (Patrucco, Luzzini, and Ronchi, 2016; Bals, Laine, and Mugurusi 2018; Patrucco *et al.*, 2019), two of which are also analyzed in this study.

## 3. METHODOLOGY

Given the topic of the exploratory research and the lack of previous research on the duration of the procurement process (Patrucco *et al.*, 2019) and especially the quality of its outcome, an interview-based data collection method was considered most appropriate.

The semi-structured interview is common as a tool of the qualitative research method and is more powerful than other types of interviews within the method (Ruslin *et al.*, 2022).

First of all, an analysis was made of the most appropriate people to ask these questions to and it was concluded that, in order to capture the research as fully and from as many angles as possible, it is best to ask these questions to people who are involved in the procurement field, but in as many different positions and from as many different areas of the institutions in which they work as possible.

For example, the problem of a very large number of lots in a procedure (in the order of hundreds of lots) occurs in hospital procurement, but not in education procurement.

It has been taken in consideration that the persons to whom these questions are addressed should have at least 5 years of experience in the field so that they can provide answers with a high content of useful information.

It started with people who were known and then recommended other people who were contacted. As it was the end of the year, not all the people contacted were willing to collaborate in the interview, so in the end there were 8 respondents (see Table 1).

**Table 1. Profile of respondent subjects**

| Subject code | Experience in public procurement | In what capacity did he work | Current field of activity |
|---|---|---|---|
| S1 | 5 years | 5 years in contracting authority - currently executing | Education |
| S2 | 10 years | 2 years as bidder - execution<br>8 years as ex-post verifier of procurement files - control function | Agency subordinate to a Ministry |
| S3 | 11 years | 7 years as bidder - execution<br>4 years in contracting authority - execution | Research Institute |
| S4 | 16 years | 16 years in the contracting entity - currently in a management position | Company under a County Council |
| S5 | 8 years | 8 years in the contracting authority - currently in a managerial position | Agency subordinate to a Ministry |
| S6 | 8 years | 8 years in contracting authority - currently executing | Unit subordinate to a Ministry |
| S7 | 21 years | 5 years as a bidder<br>10 years in Control Authority - executive + management function<br>6 years in the contracting authority - currently in a managerial position | Autonomous Regie under a Ministry |
| S8 | 14 years | 14 years in the contracting authority - currently executive function | Institution in the field of Health |

Source: the author

## 4. INTERVIEWS AND RESULTS

The interview protocol was developed following a review of the literature in the field.

The interview guide is in Annex 1. The questions and their wording are also based on the researcher's practical experience of more than 14 years in public procurement.

The guide included an introductory section in which the interviewee was informed about the study, its purpose, possibilities for further use of the data, confidentiality clauses and freely expressed consent to participate in the study, rights of withdrawal from the study and the interviewee's agreement to the recording of the interview, and a number of 12 questions in which the interviewee is encouraged to express his/her opinion and provide information on the parts of the public procurement field analysed by this research.

In addition to the recording application, the interviewer made real-time transcripts of the responses received. In the case of three interviews, people did not agree to be recorded for personal reasons, so responses were noted down as the interviewee spoke.

The interviews lasted an average of 34 minutes, the shortest being 24 minutes and the longest 50 minutes and were conducted over 3 days.

The first two interview questions were designed to obtain information about respondents and their experience in the field. As can be seen from Table 1, the profile of the subjects is extremely varied, covering a wide range of areas of activity where procurement legislation applies. Their experience is on average 11.6 years, with a minimum of 5 years and a maximum of 21 years.

In terms of the position in which they worked, we note that they have experience both on the bidding side (3 subjects), experience on the execution side (5 subjects), in the management structures of the procurement departments of the contracting authority (3 subjects) and in the area of control of procurement processes (2 subjects). One of the subjects also previously worked in one of the institutions with a control role in the field of public procurement.

The next 5 interview questions focused on the **factors influencing the duration/time indicator - the first part of the research scope**, analysing 3 known factors: bureaucracy, disputes and SEAP (the Electronic Public Procurement System - the portal through which bidders and Contracting Authorities meet online, accessible at a dedicated web address: www.e-licitație.ro, which also includes the portal www.integritate.e-licitatie.ro).

The factors that resulted from these questions were grouped into two categories: factors that have negative effects on the time indicator and factors that have positive effects on the time indicator.

The first category, those with negative effects, have been sub-grouped into several components:

**The bureaucracy component** comprises several sub-components**:** ex-ante control exercised by the National Agency for Public Procurement (ANAP) - 10 references to 5 of the interviewees, the part of the forms used (number and size) - 6 references to 5 of the subjects, the minutes of the evaluation of the offers - 3 references to 3 of the subjects and the simplified procedure - 3 references to one subject.

This component gathered a total of 30 references during the 8 interviews, all interviewees being of the opinion that there is bureaucracy in this area, but that it could be reduced.

One of the respondents is of the opinion that it has decreased from the level of 10 years ago, although, as a practitioner, I am of the opinion that it has increased every year since 2008 until now.

The reduction of the forms in the award documentation is initially under the control of the Contracting Authority, and subsequently beyond the control of the Contracting Authority. The second level - beyond the control of the Contracting Authority - could also be included in the **Legislation component.**

The field of public procurement is over-regulated; although the Romanian legislation is based on European directives, its transposition has added many requirements to the directive, including the designing of the simplified procedure.

Directive 2014/24/EU lays down rules for purchases over €140,000 excluding VAT, below which Member States can make their own rules, more permissive or more bureaucratic.

**The SEAP component**, although also identified during the interviews as a helpful factor, was mentioned by 7 interviewees as a factor that slows down the duration of the procurement process with 11 references in this regard.

The **third component, appeals**, also has several sub-components/sub-factors that facilitating its occurrence, as follows: with 5 references: superficial evaluation by the evaluation committee, restrictive requirements in the Award Documentation, loss of the procedure by the tenderer (an interesting explanation of this sub-factor was "let the neighbor's goat die") as well as violation of principles by the Contracting Authority. With fewer references (4) were also the inconsistency of the National Council for the Settlement of Disputes (CNSC)- some courts, on the same case, give justice to the Contracting Authority, others give justice to the tenderer - thus some tenderers hope that their appeal will be judged by a court that gives justice to the tenderer.

With 3 references each there were also "lack of trust in the Contracting Authority" and "interference from CA management" - interference leading to poor evaluation/failure to follow the principles - two people have experienced this type of interference at least once.

This component **- appeals -** accumulated **31 references** during the interviews.

The fourth major component that negatively influences the duration of a procurement process**, Legislation** (poorly formulated/ poorly expressed)**, accumulated 16 references** during the interviews.

Other components of this category have accumulated fewer references.

**In total, the category of factors that generate negative effects on the duration of the procurement process cumulated 71 references from the 8 interviewees.**

**Factors that have a positive effect on the duration of the procurement process have cumulated 14 references.** Of these, the SEAP is seen by 8 respondents as a helpful factor in the duration of a public procurement process. Compared to the electronic system of 10 years ago, it has certainly evolved, but it also has deficiencies in its functioning, which is why it is seen both as a helpful factor in shortening the duration of the process and, paradoxically, as a factor increasing the duration of a procurement process. An improvement of this tool would shift the balance in being seen only as a factor that positively influences the duration of a procurement process. This tool is beyond the control of the Contracting Authority, the only option being to train its staff in its use.

**Standardised specifications** is another component that has positive effects on the duration of a public procurement process with 3 references in this regard. This component is closely related to the next one in order of importance of the number of occurrences: Central Procurement Units (CPU); these are primarily based on standard configurations for all all the institutions using them. They make high-volume purchases, often obtaining a better quality of purchased products than Contracting Authorities could obtain or higher discounts from tenderers.

**All these components of the two categories are associated with another major component: staff.**

This component comprises several subcomponents: Procurement staff: 17 occurrences. Specialist technical staff and their level of involvement (10 references). Staff overload was mentioned 6 times and inadequate remuneration had 5 references during the interviews.

Public procurement staff require more professionalisation, although "they are people with multidisciplinary training". This need for a higher level of professionalism is also due to the frequent legislative changes and the lack of clarity in the current legislative framework. It emerged that it is useful for people in these structures to have previous training in the field in which they carry out procurement, as this leads both to a shorter process time and an increase in the quality of the result.

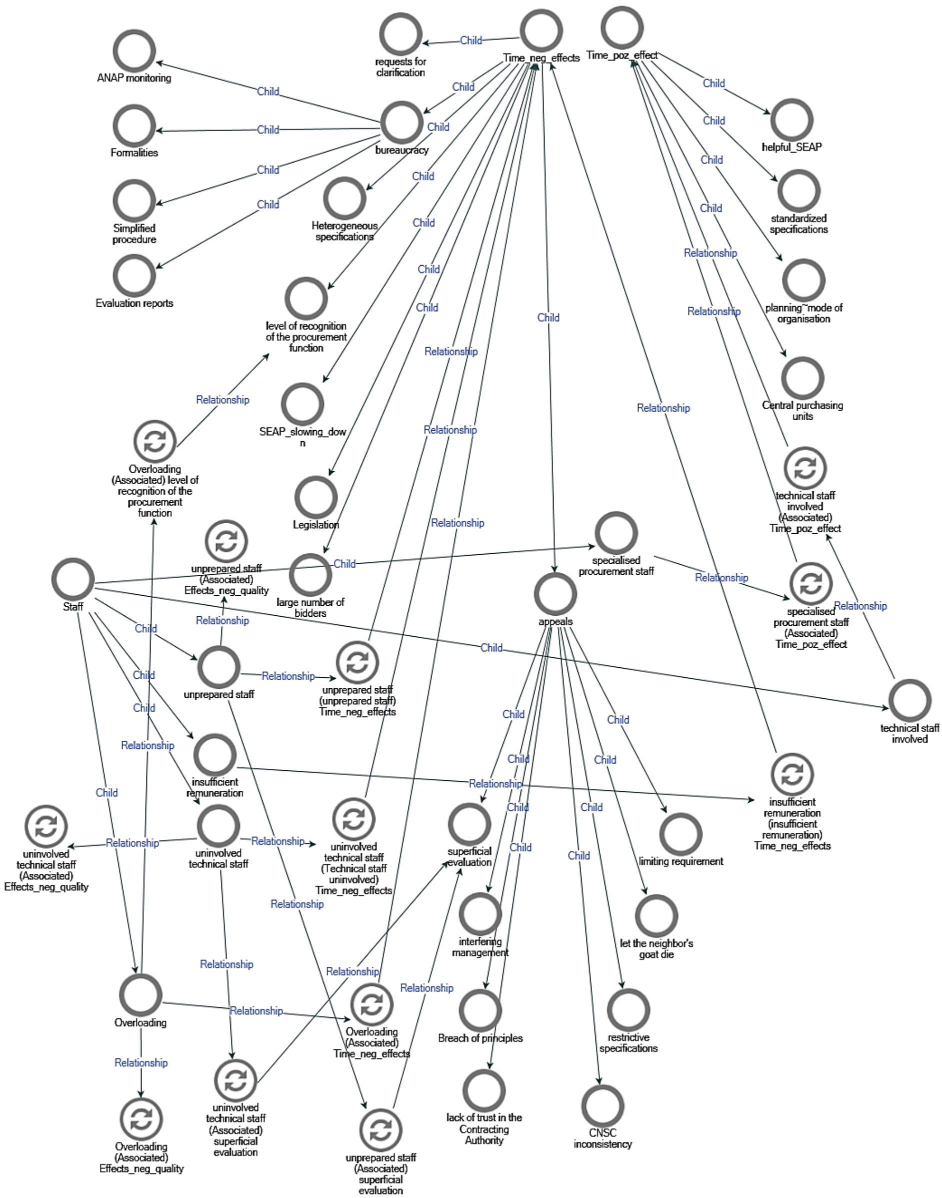
The existence or not of technical staff and their lack of involvement can significantly determine the duration of a procurement process. The lack of such staff can be compensated for by the involvement of experts from outside the Contracting Authority. This staff can determine a correct evaluation by the evaluation committee, which also has a direct influence on the **appeals component**.

The part of staff overload is related to internal management, with institutions where there is enough staff and institutions where there is not enough staff (3 out of 8 respondents were of the opinion that there is not enough staff at least in their institution). The degree of staff overload also depends on the level of recognition of the procurement function by the management area of each public institution.

Insufficient remuneration is often a factor external to public institutions, unlike in private organisations where management can intervene directly, but sometimes solutions can also be identified in the public area.

As a proposal for change in the field of public procurement, most respondents (6 out of 8) would like to see **legislative changes**, which indicates that the biggest problems in the system are considered to be those induced by the **legislative factor**. In second place in the respondents' options are changes in some of the state institutions active in this field: The National Agency for Public Procurement and the National Council for Settlement of Disputes with 3 appearances each and the Court of Accounts with one appearance. The interviewees consider that the activity of these institutions is not normal and that instead of helping the processes of the Public Procurement system in Romania, they make the process more difficult.

The breakdown of the categories of factors influencing the duration of a public procurement process is given in Figure 1.




Source: author's own elaboration

**Figure 1. Breakdown of factors influencing the duration of a public procurement process and their associations**

**The second part of the research aim, closely related to the first, looked at the quality of the outcome of a procurement process.**

Again, the factors influencing the quality of the outcome have been grouped into two categories: those positively influencing the quality of the outcome and those negatively influencing it.

The first step in analysing the quality of the outcome of a procurement process is to define it.

Some interviewees defined quality in terms of time (efficiency of its use), compliance with the requirements of the specifications or compliance with legislation/standards, in the number of contracts awarded, in efficiency and effectiveness, in proper planning. Others referred to the durability of the result (product/service/work) and the guarantee period.

One interviewee defined quality as "Purchasing the right thing, on time and efficiently (efficiency does not mean cheap, but at the price given by the competition)" a definition with which I also largely agree as a public procurement practitioner.

Another interesting answer from this point of view was "to achieve the objective of the procurement and to comply with the legislation (which is FAR FROM PERFECT). I mean, if we have 100% complied with the rules, but the procedure ends up being cancelled, I can't help thinking about that saying.... "successful operation, dead patient".

The measurement part of it posed problems for the interviewees: two people chose not to answer, one respondent referred to the "quality level" of the services they receive, others referred to the number of processes completed through signed contracts/per unit of time, another respondent gave an interesting answer: "by real, tangible results, not by bunches of papers and files showing how much work has been done; I measure it by having a hospital that is stocked with everything it needs, by cleanliness, by employees who have the equipment they need, by rehabilitations, new buildings, by investments in innovation that do not remain only at the project stage, studies, but that get to know the concrete." - a way of measuring by the degree to which the proposed goal has been achieved, a definition with which I fully agree and which has also been found in various forms in the replies received.

They excluded the definition of the quality of a procurement process by "the degree of spending of the allocated budget", an exclusion with which I also agree as a practitioner.

Among the components that determine a positive effect on the quality of the outcome were: tracking how the contract was implemented (3 occurrences), product specifications focusing on those characteristics of the product that make it considered to be of quality, and the Centralised Purchasing Unit, which were also found in the category of factors that determine positive effects on the duration of a public procurement process.

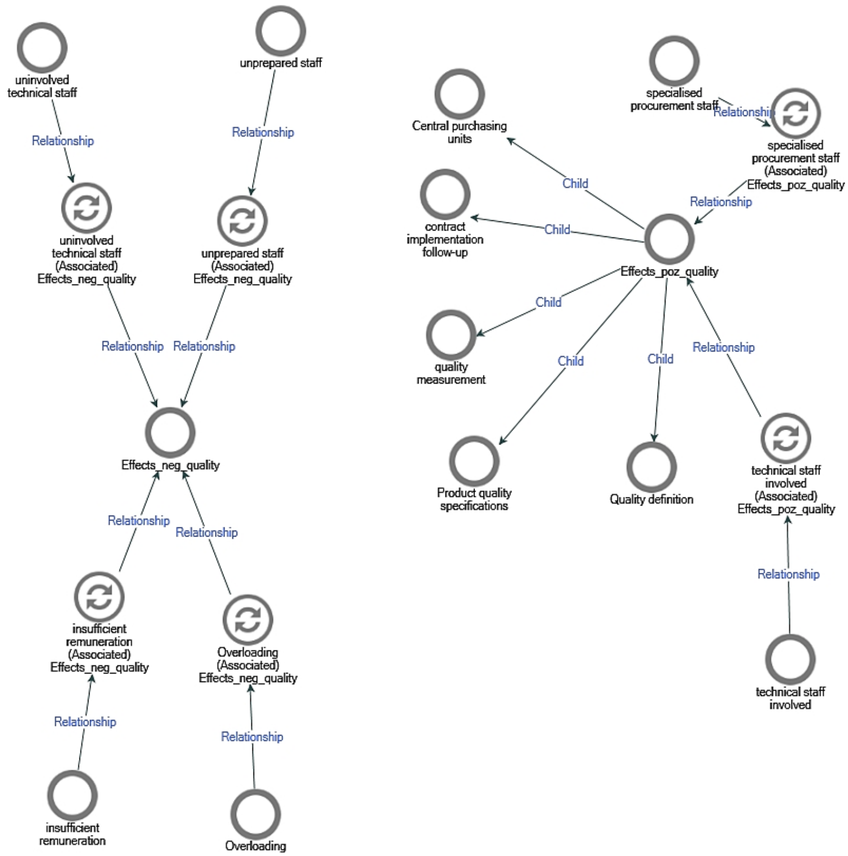
No clear components were identified in the interviews for the category of negative effects on the level of quality of the outcome of a public procurement process.

**For both the category** of those with positive effects on the quality of the outcome and the category of those with negative effects, **associations** were identified **with components of the Staff category**, as follows:

Technical staff involved as well as procurement staff are associated with positive effects on the quality of outcome indicator.

Uninvolved/absent technical staff, unprepared procurement staff, overloaded staff and inadequate staff remuneration are more likely to be associated with negative effects on the quality of the outcome of a procurement process.

The breakdown of the categories of factors influencing the quality of the outcome of a public procurement process is given in Figure 2.




Source: author’s own processing

**Figure 2. Breakdown of factors influencing the quality of the outcome of a public procurement process and their associations**

Some of the **proposals for improvement of** the public procurement system in Romania made during the interviews: Improvement of public procurement legislation with the help of the practitioners directly involved, both from Contracting Authorities and Economic Operators; Application of Directives in letter and SPIRIT; Adequate remuneration of procurement experts; Increased professional training of practitioners; **represents the solution of some problems/elimination of some factors found previously**, being from this point of view a control question in relation to the other questions asked.

Some of these issues are already on the public agenda of government and procurement agencies (Adequate remuneration of procurement experts, Increase the number of Central Procurement Units, Increase the professional training of practitioners), but relatively few steps have actually been taken.

One of these proposals (Improving legislation with the help of practitioners directly involved) addresses a factor that influences the quality of the public procurement process but also generates bureaucracy in this area.

The application of the Directives in their letter and spirit can be seen in conjunction with the elimination of the simplified procedure and is related to the proposal to improve the legislation in this area.

The proposal to outsource the procurement service comes as a solution to the problems of managers interfering in the work of the evaluation committee and the pressures applied to its members. By outsourcing, this would no longer happen.

## 5. DISCUSSIONS

Knowing the factors that influence performance is particularly important, and once known, it is possible to intervene on some of them to optimise the values of the indicators.

Some of the factors are internal to the institution, others are external. People with long experience in this field are of the opinion that there is bureaucracy in this area, but that it could be reduced. Some possibilities to reduce bureaucracy are in the area of control of the contracting authority. Here we can include reducing the number of documents required from tenderers to the minimum required by law or by the subject of the contract. Standardisation of configurations - a maximum of 3 models of printer should be used in all departments - is another measure that would reduce procurement time and therefore the level of bureaucracy. The creation of shorter document circuits would be part of the improvement of the response time of the Contracting Authority management and would reduce internal bureaucracy.

The Contracting Authority cannot intervene in external factors that generate bureaucracy, as this is a very structured and formalized area (Hochschorner and Finnveden, 2006).

SEAP is seen mainly as a helpful factor, but if improved, it would help to reduce the duration of a procurement process. It falls under factors external to the organization and to which the organization needs to align itself through trained staff with good IT knowledge.

Appeals are another external factor. The Authority cannot intervene to stop this phenomenon, but it could take measures to mitigate this risk. More clear tender documentation, less restrictive but ensuring that the purpose of the procurement is achieved, and greater transparency on the side of the Contracting Authority, are factors that can help to reduce the risk of contestation.

Where the outcome of an award procedure is required by a certain date, the Contracting Authority should start the process sufficiently in advance so that any appeal submitted can be considered and judged before the deadline for delivery/performance.

Specialist staff are very important in a public procurement process, both procurement and technical specialists who can carry out a proper analysis of the bids. Their lack of involvement is a problem that the Contracting Authority needs to address, as it is an internal factor. Insufficient remuneration is often an external factor (the payment level is set by law, unlike in private organisations where management can intervene directly), but sometimes solutions can also be identified in the area of public institutions.

The part of staff work overload is related to internal management, there are institutions where there are enough staff and institutions where there are not enough staff (3 out of 8 respondents were of the opinion that there are not enough staff at least in the institution where they work). The level of staff workload also depends on the level of recognition of the procurement function by management.

Most specialists in the field would like to amend the legislation and are of the opinion that this amendment would directly lead to shortening the duration of a procurement process and directly influence the quality of the outcome. I fully agree with these views, the legislation is deficient, with gaps and inappropriate wording and leads to the delay of these processes.

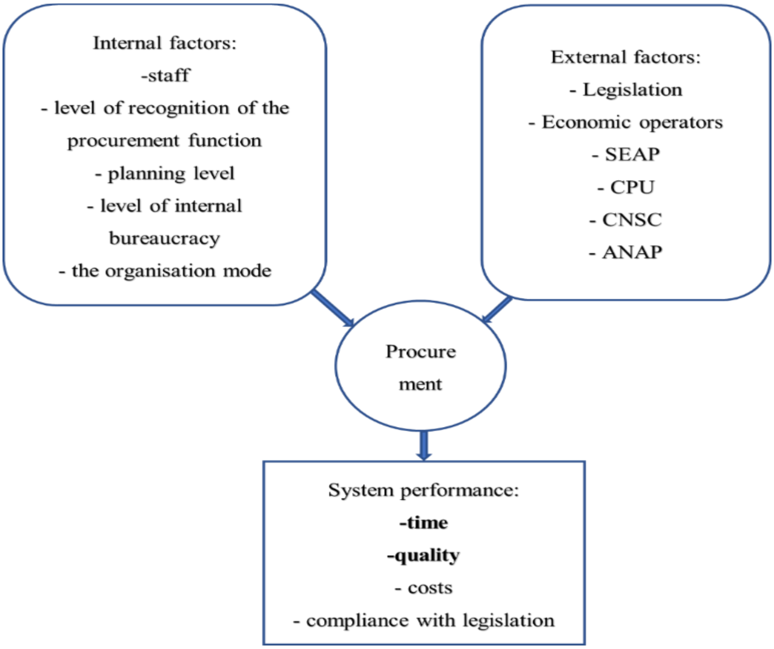
Another proposed amendment, which I agree with, would be to eliminate the simplified procedure, which is specific only to Romania, as this procedure applies in the area not regulated by the relevant European Directives, but it also requires amending the relevant legislation.

In terms of the **quality of the outcome of a public procurement process**, I think the most appropriate **definition** would be: to have the right product, in the right quantity, at the right place, at the right time, at the right price, and that allows you to solve the need that generated this procurement process.

In summary, the factors influencing these indicators (Figure 3) can be grouped into internal factors (**staff**, **level of recognition of the procurement function -** which sometimes also determines staffing problems, level of planning **-** which often also affects the staffing component, **level of internal bureaucracy**, **mode of internal organisation**) and external factors (**Legislation**, Economic Operators, **SEAP**, Central Procurement Units-CPU, National Council for the

Settlement of Disputes-CNSC, **National Agency for Public Procurement - ANAP**).

These factors influence, to a greater or lesser extent, the duration of a public procurement process.




Source: processing after Patrucco *et al.* (2019, p.14)

**Figure 3. A conceptual framework on the influence of factors and the need to determine them**

## 6. CONCLUSIONS

Knowing the factors that influence a process is particularly important. By identifying how each of these factors influences the outcome of the process, management can intervene in the process to increase the level of one or more components of the outcome, and this work is useful to management in this way. The most frequently mentioned internal factor is the personnel factor, which can be broken down into several components: level of specialist knowledge, level of technical training, overload; the most frequently mentioned external factor is poor legislation, followed by the National Agency for Public Procurement, which some respondents even proposed dissolving.

Public institutions must constantly adapt to environmental factors and their rapid changes, which contributes to the performance level components of Public Procurement.

The procurement function in the public sector is often given less importance than in the private sector. There is very little research on this area - public procurement - compared to private company procurement. This idea is also found in other authors: Patrucco *et al.* (2019) who quotes Thai (2015).

One direction for further research could be to identify and analyze similar factors in other European countries applying the same Directive.

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# ANNEXES

## Annex 1
## Interview guide

**Objective of the study:** to identify the factors that have an impact on the running of a procurement process in terms of the duration of the process and the quality of its outcome.

**Subjects:** professionals/people involved in the public procurement domain.

**Content:**
**1.** Please tell me how many years have you been involved or active in the field of public procurement in Romania?
**2.** Can you briefly tell me about your experience in the field of Public Procurement (experience in this field, if you are a practitioner in the Contracting Authority/ as a tenderer/ manager of procurement structure/etc.)?

**Duration/time indicator:**
**3.** What do you think about bureaucracy in public procurement? Does it exist? Can it be reduced? How?
**4.** Consider the SEAP (including the integrity.e-licitatie.ro portal), through its functions:
**-** an aid in the conduct of a procurement procedure; or
**-** a factor that makes it difficult to carry out a procurement procedure?
Can you elaborate?
**5.** What do you think are the causes that lead an economic operator to submit an appeal? Could there be any other reason?
**6.** In your opinion, what other factors can influence the duration of a public procurement procedure?
**7.** Suppose you could change **one thing** about Public Procurement. What would that be? It's interesting what you say, can you elaborate?
What else would you change in this area?

**Quality indicator:**
**8.** In your opinion, how would you define the quality of the outcome of a public procurement process?
**9.** How would you measure the quality of the outcome of a public procurement process?
**10.** In your opinion, what factors influence the quality of a public procurement process as an outcome of the process (product delivered/service rendered/work).
**11.** If you were to propose to the government (Parliament, Government, etc.) an improvement of the Public Procurement system in Romania, what would it be?

**Staff:**
**12.** What is your opinion of the human resource working in the field of public procurement, in terms of the level of workload, the degree of professionalism, and the role it plays in the running of a procurement process.

# SMART CITIES IN CENTRAL AND EASTERN EUROPE – A CASE STUDY APPROACH

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**Abstract**
*In Europe, 'smart cities' represent the new approach to urban development. In fact, the concept has emerged to better grasp the need for change in urban development practices that could increase the quality of life through the optimization of hard (e.g., transport, energy, resources) and soft (e.g., human capital, inclusion, participation) infrastructure. The 'smart' dimension is not only meant for rethinking the fundamental framework of a city but also for making it more innovative and competitive. With regard to the existing literature on the topic, much attention has been given to studying the concept itself and to the various factors that enable the smart transition of cities. Nonetheless, the focus is rather on the more developed countries in Western Europe, neglecting the emerging markets and developing economies as those in Central and Eastern Europe (CEE). Here, the `smart city` concept cannot be analyzed without considering the historical determinants and development factors. Therefore, it is useful to determine which cities can be labelled as smart in CEE and whether urban areas in the post-socialist space can keep up with the implementation of such novelties. Using a case study approach, the paper seeks to identify the specific features of the five most smart cities in Central and Eastern Europe (Prague, Warsaw, Tallinn, Bratislava, and Vilnius) and how these differ from the Western European models. The paper begins with a brief literature review of the concept and then highlights how its definition might differ in the context of CEE. Afterwards, the paper presents the research method and continues with the results of the analysis on the five CEE countries (revealing, in the process, common features as well as unique characteristics). Preliminary research suggests a slow adaptation process accompanied by a lack of coordination across many sectors and numerous barriers (including financial ones) to an effective implementation of the concept in the CEE countries. This exploratory study is more than relevant for*

*policymakers and urban planners to devise and properly implement tailored smart city policies that could, in the end, improve the citizens' quality of life. These policies are to address various urban dimensions such as citizen engagement, economic growth, environmental protection, social cohesion, public spaces accessibility and efficient public services.*

**Keywords:** *smart city; Central and Eastern Europe; particular features; smart governance.*
**JEL Classification:** H70, O18, O52, R11, R58

## 1. INTRODUCTION

Cities today represent complex systems, characterised by increasing numbers of residents, diverse and interconnected services and utilities and extensive networks. At the same time, urban areas are the main centres of economic growth, concentrating more than half of the world's population and contributing to over 80% of the global GDP (UN, 2022). However, cities are also responsible for more than 70% of global resource consumption and greenhouse gas emissions due to the intense economic and social activities, increasing urban density as well as inefficient urban planning (Bibri and Krogstie, 2017). Thus, the challenges cities face are manifold, with complex spillovers towards social issues such as access to education, health, housing, environmental, related to pollution, ecosystem degradation and of course administrative, associated with citizen participation and quality of life (Kirimtat *et al.*, 2020; Zheng *et al.*, 2020). Therefore, the urbanisation process of the 21st century needs to be shaped and organised so that cities can achieve their potential to prosper, increase social cohesion, environmental quality and citizens' well-being.

In recent decades, the smart city concept has become a popular tool used by cities and citizens to address today's urbanisation challenges, representing a significant shift in urban development practices globally. In a broad sense, the concept involves the use of technology to improve urban services, while projecting the opportunity to increase the quality of life through the optimisation of soft (human capital, inclusion, participation) and hard (transport, energy, resources) infrastructures (Nam and Pardo, 2011b). In Central and Eastern Europe these solutions have received increased attention in the last years, mainly developed by local administrations of capital cities or large urban areas. The smart transition became a policy priority for many cities while the administrations embraced smart city strategies to show their desire to achieve economic, social and democratic growth.

This paper aims to investigate how a selected panel of Central Eastern European cities have adopted and implemented Smart City strategies, revealing trajectories and specific features that have emerged from practice. Thus, we will analyse the extent to which Smart City strategies have encouraged urban transformations, reflecting a comprehensive perspective on the smart city discourse. Based on the content analysis of relevant sources, we discuss the priorities and strategic dimensions of Smart City strategies in the capital cities of

Vilnius, Bratislava, Prague, Tallinn and Warsaw. Our research methodology is mainly qualitative and is centred on a literature review and evidence extracted from strategic documents provided by local governments.

## 2. LITERATURE REVIEW

### 2.1 Smart City conceptualisation

In recent years, the smart city concept has gained increased attention from academia, business and policy-making and various actors have tried to identify a universal definition (Lombardi *et al.*, 2012; Kourtit and Nijkamp, 2012; Albino, Berardi and Dangelico, 2015). However, the term remains rather fuzzy and the lack of consistency in its understanding often leads to various adaptations to specific interests and fields (Hollands, 2008). The conceptualisation of the smart city derived from similar concepts such as `digital city`, `information city`, and `intelligent city`, all of these having common features as well as individual components, that point to distinct agendas. The notions emerged in the 1990s with the increasing use of technology in urban development and present different levels of ICT integration in urban systems. The `digital city` and `information city` consider technology the main driver of service development in cities, through improvements of infrastructure, connectivity and online services (Castells, 1996). The `intelligent city` implies a great focus on innovation through creativity, artificial intelligence and collective intelligence, aiming at systemic changes in urban life (Komninos, 2013).

This discussion has shown that the smart city concept has evolved into an open and technology-oriented city, in which ICTs are coupled with the social, environmental and economic dimensions. Although the research on the smart city has developed significantly in the last decades, the literature lacks cohesion and unity. Scholars from different fields have explored various conceptualisations and driving factors of smart city development (Caragliu, Del Bo and Nijkamp, 2011; Lombardi *et al.*, 2012; Kourtit and Nijkamp, 2012; Neirotti *et al.*, 2014; Angelidou, 2014). Thus, several definitions were formulated and adopted both in research and practice (see Table 1).

**Table 1. Smart City definitions**

| Approaches in the scientific literature | Source |
|---|---|
| “A city is smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.” | Caragliu, Del Bo and Nijkamp (2011) |
| “A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens” | Giffinger *et al.* (2007) |

| Approaches in the scientific literature | Source |
|---|---|
| "The vision of 'Smart Cities' is the urban center of the future, made safe, secure environmentally green, and efficient because all structures—whether for power, water, transportation—are designed, constructed, and maintained making use of advanced, integrated materials, sensors, electronics, and networks which are interfaced with computerized systems comprised of databases, tracking, and decision-making algorithms" | Hall *et al.* (2000) |
| "Smart cities are the result of knowledge-intensive and creative strategies aiming at enhancing the socio-economic, ecological, logistic and competitive performance of cities. Such smart cities are based on a promising mix of human capital (e.g. skilled labor force), infrastructural capital (e.g. high-tech communication facilities), social capital (e.g. intense and open network linkages) and entrepreneurial capital (e.g. creative and risk-taking business activities)" | Kourtit and Nijkamp (2012) |
| "The various positions in the debate agree on the fact that an SC should be able to optimize the use and exploitation of both tangible (e.g. transport infrastructures, energy distribution networks, natural resources) and intangible assets (e.g. human capital, intellectual capital of companies, and organizational capital in public administration bodies)." | Neirotti *et al.* (2014) |

Source: developed by the authors

These definitions present a future-oriented city, providing insight into the various meanings and characteristics of the smart city. While some scholars argued that technology is the key driver of smart development, others have proposed various models for measuring 'smartness'. Giffinger *et al.* (2007) built a smartness benchmarking model on six pillars - smart economy, smart mobility, smart environment, smart people, smart living and smart governance. Caragliu, Del Bo and Nijkamp (2011) define the smart city as aiming at improving economic and political efficiency, emphasising the role of technology and innovation in tackling social and environmental challenges. Nam and Pardo (2011) identified three categories of smart city, based on their ICT integration, such as *digital, intelligent* and *virtual* city, providing a broader understanding of the concept, going beyond technology and highlighting the human and institutional dimensions.

A similar perspective is developed by Silva, Khan and Han (2018) who identified four infrastructural dimensions of the smart city, namely *institutional, physical, social* and *economic*. The institutional infrastructure refers to urban governance and is linked to participation and transparency, the physical infrastructure addresses natural resources and ICTs and the economic infrastructure implies innovation, creativity and opportunities. The social infrastructure is represented by human capital and quality of life and is considered the essential dimension of smart cities as social responsibility and participation ensure the sustainability of any project. Neirotti *et al.* (2014) define two domains for smart city use of tangible and intangible resources. The hard domain addresses energy, environment, transportation, buildings and safety issues, while the soft domain concerns education, government, society and the economy. Furthermore, they identify six key sectors of smart city applications which refer to natural resources and energy, transport and mobility, buildings, living, government, economy and people.

Although the concept of *smart city* has been analysed through numerous and various approaches, its wide interpretation is given by the integration of ICTs in urban systems to increase their efficiency. However, the mere implementation of technological solutions cannot describe the smart transition and it can increase inequalities among citizens and the government's dependency on private companies (Townsend, 2013). Moreover, many cities have adopted the *smart city* label for branding purposes (Hollands, 2008), while their vision is oftentimes driven by profit. The smart city narrative is also critiqued for its ‘one size fits all’ perspective and scholars call for context-based analysis that can provide realistic images of smart projects implementation and results.

## 2.2 Smart Cities in Europe

Smart cities emerged as a new approach to urban development practices and in Europe, the smart transition is understood as a way of becoming more innovative and competitive (Dameri and Cocchia, 2013). The literature discusses the concept through case-study analyses of capitals such as Barcelona (Bakıcı, Almirall and Wareham, 2013), Vienna (Fernandez-Anez, Fernández-Güell and Giffinger, 2018) or multiple cities (Vanolo, 2014; Anthopoulos, 2017). Other scholars argue that the smart city encompasses urban planning (Komninos *et al.*, 2019), urban experiments (Cowley and Caprotti, 2019) or quality of life (Kourtit, 2019). Furthermore, the vision of smart cities is often linked to urban performance in terms of innovation (Kourtit, Nijkamp and Arribas, 2012) or competitiveness (Taylor Buck and While, 2017) and most recently, sustainability and resilience (Bănică, Eva and Iațu, 2019; Bănică *et al.*, 2020).

Western cities dominate both the *smart city* literature and practice, with successful models coming from Amsterdam (Mora and Bolici, 2017), Barcelona (Bakıcı, Almirall and Wareham, 2013), Copenhagen (Bjørner, 2021), Helsinki (Antrobus, 2011), London (Bibri and Krogstie, 2020) or Vienna (Fernandez-Anez, Fernández-Güell and Giffinger, 2018). Smart city rankings worldwide (IESE, 2020) prove that Western European cities have integrated such initiatives into their long-term urban development framework and are aligned with global sustainability priorities. Most Western European cities have integrated ICTs into their infrastructure, increasing efficiency and accessibility in terms of governance, transport and environment. Furthermore, the social dimension is enhanced through collaboration, education and investments in research.

## 2.3 Smart cities in Central and Eastern Europe

Central and Eastern European cities differ from Western ones due to their unique geographical and historical determinants. The economic and governance transformations have had both a positive and negative impact on citizens' lives, also generating significant changes in urban development patterns (Tuvikene, 2016). The challenges that these cities face today affect all areas of urban life and call for innovative solutions, yet, the smart city notion does not have a clear position in urban management across this region.

The concept of 'smart city' has been introduced in CEE research and practice in the last years, with significant attention put on cities from Poland, Croatia, Romania and Hungary (Ibănescu *et al.,* 2020). While the smart transition is expected to increase the quality of life and governance (Dameri, 2013), CEE cities' vision is distinct from other regions. The literature discussing the Visegrad countries underlines their dependency on EU funding for urban development and innovation, while the inherited top-down governance structures can hinder smart transformations (Varró and Szalai, 2022). Furthermore, smart solutions are mostly developed by private business actors, following the best practice examples coming from Western countries, yet without accounting for all urban dimensions (Sikora-Fernandez, 2018). Although the integration of ICTs in city services has become a priority for most CEE countries, promoting the opportunity to enhance transparency, accessibility and governance, it must be supported by local stakeholders to generate concrete benefits (Ibănescu *et al.*, 2020).

The Baltic cities started the digitalisation process in the early 2000s, developing digital agendas that address e-government, ICTs and digital skills training (Kattel and Mergel, 2019; Akmentina, 2022). Although the capital cities have prioritised the smart transition through the integration of ICTs, they face similar challenges to the other CEE cities, associated with the post-socialist past, such as mistrust, low level of participation or uncertainty (Grazuleviciute-Vileniske and Urbonas, 2014). Participatory planning emerged alongside digitalisation and e-participation became the basis of urban development strategies in all three Baltic countries (Akmentina, 2022), Estonia, Tallinn and Riga providing best practice models.

Global rankings of smart cities rarely include CEE cities due to their small-scale implementation of projects. As follows from the IESE Cities in Motion Index, which evaluates the smartness and sustainability of cities worldwide based on key urban dimensions (economy, environment, human capital, social cohesion, mobility, governance, international profile and technology), the global leader is London, followed by global metropolises such as New York, Paris and Tokyo. However, CEE cities are visible in European rankings of smart cities, yet only capital cities are found among Western European ones as successful smart solutions are concentrated in larger urban areas. Furthermore, significant disparities are visible among CEE cities, also in regard to the orientation of the smart agenda.

While the smart projects in the Baltic region imply the digitalisation of urban services and sustainability, in Visegrad cities, the smart agenda is focused on improving infrastructure (Kattel and Mergel, 2019; Ninčević Pašalić *et al.*, 2021).

Overall, the smart initiatives from CEE resemble Western European trends, yet their effectiveness is still under question. Considering the major transformation that these cities have undergone in the last decades, smart solutions must be developed taking into account the challenges they are facing today. The smart transformation of CEE cities is still an ongoing process and in-depth empirical analysis is needed to establish a comprehensive CEE smart city model.

## 3. METHODOLOGY

The paper seeks to identify the specific features of the five most smart cities in Central and Eastern Europe (Prague, Warsaw, Tallinn, Bratislava and Vilnius) and analyse how these differ from the Western European models. Our research implied three levels of analysis, starting with a review of current SC trends and a brief evaluation of the smart transition process from each case study. Based on the content analysis of relevant sources, we discuss the priorities and strategic dimensions of SC strategies and UD strategies in the capital cities. Following this, we developed a general profile of smart city priority areas, having identified various types of SC initiatives. The aim was to determine the orientation of existing strategies and plans, following the classifications of Neirotti *et al.* (2014) and Silva, Khan and Han (2018).

## 4. CASE STUDIES

Cities represent engines of economic growth and innovation. The smart city concept aligns with the aspirations of CEE cities to become more efficient and sustainable, taking into consideration the global priorities. Although the challenges they are facing are complex and cover various aspects of urban life and not all cities are governed by visionary leaders, their private sector provided opportunities for growth. In recent years, under the European Cohesion Policy, many CEE cities have benefited from investments in key domains, such as transport, digitalisation, health and education, registering high rates of economic growth (Kollar *et al.*, 2018).

CEE capital cities, such as Prague, Bratislava, Warsaw, Tallinn and Vilnius are home to majority of the countries' population, being also the economic, social and cultural hubs. Their productivity is explained by the presence of a developed and innovative private sector, as well as a high concentration of professional and educated workforce.

### 4.1 Bratislava

Bratislava is the capital of Slovakia and the political, cultural and economic hub of the country, with a population of over 400.000 citizens. Bratislava is making significant strides towards becoming a smarter city. The city's efforts are focused on using technology and data to improve the quality of life of its citizens and create a more sustainable and efficient urban environment. The capital was ranked the 4$^{th}$ smartest city in Eastern Europe and 62$^{nd}$ Worldwide in the Cities in Motion Index (IESE, 2020). Although the city lacks a coherent Smart City Strategy, the Bratislava 2030 Strategy addresses the smart transition.

One of the key areas of focus for Bratislava's smart city initiatives is transportation. The city has introduced a smart parking system, which uses sensors to detect available parking spots and directs drivers to them via a mobile app. Additionally, the city is developing a network of bike lanes and is working on improving public transportation through the use of real-time data and smart traffic management systems. Bratislava is also implementing smart solutions in the areas of energy efficiency and environmental sustainability. The city has installed smart LED lighting in public spaces, which can be controlled remotely and adjust to the surrounding light levels. Bratislava is also working on developing a smart grid system that will allow for more efficient energy use and management. In addition to these initiatives, Bratislava is also implementing smart solutions in the areas of public safety and healthcare. The city is using data analysis to improve emergency response times and is developing a smart healthcare system that will allow for more efficient and personalised medical care.

### 4.2 Prague

Prague is the capital and largest city of the Czech Republic. The city is home to approximately 1.3 million people and is the political, economic, and cultural center of the country. The city is also home to a number of universities and research institutions, making it an important hub for education and innovation. Prague has undergone significant development in recent years, with a focus on improving transportation, revitalizing brownfields, expanding green spaces, and creating affordable housing. The city has also implemented a number of smart city initiatives to improve the quality of life for residents and visitors while promoting sustainability and economic growth.

Prague (capital of the Czech Republic) was ranked the smartest city in Eastern Europe and 39$^{th}$ Worldwide in the Cities in Motion Index (IESE, 2020). The Smart Prague 2030 strategy is based on six key areas where the use of ICTs will have a great impact on the quality of life: Mobility of the future; Smart buildings and energy; Waste-free city; Attractive tourism; People and the city; Environment; Open data.

Mobility initiatives include the development of intelligent transport systems, smart parking solutions, and bike-sharing schemes to improve transportation efficiency and reduce traffic congestion. The city has also introduced a public transportation app that provides real-time information about routes, schedules, and disruptions. Environment initiatives focus on sustainability and conservation, with the implementation of eco-friendly programs such as waste management and recycling initiatives, energy-efficient buildings, and green spaces. Governance initiatives aim to improve public services and transparency by implementing digital solutions such as e-government services, open data initiatives, and citizen engagement platforms. For instance, the city has launched a platform where citizens can report issues such as potholes and streetlight outages. Living initiatives aim to enhance the quality of life for residents and visitors by providing smart solutions for healthcare, education, culture, and tourism. Examples include the development of smart buildings with integrated services such as security, heating, and lighting, as well as digital solutions to improve access to cultural events and tourist attractions.

### 4.3 Warsaw

Warsaw is the capital and largest city of Poland. Located in the eastern part of the country, it has a population of approximately 1.8 million people. In addition to its cultural attractions, Warsaw is also an important economic centre, with a strong industrial and business sector. The city is home to numerous universities and research institutions, as well as a thriving startup scene. Warsaw has been making significant efforts towards becoming a smart city in recent years. The city was ranked the 54$^{th}$ smartest city Worldwide in the Cities in Motion Index (IESE, 2020), working to use technology and innovation to improve the quality of life for its citizens, enhance sustainability, and boost economic growth. The capital built its vision for smart transition based on the existing ecosystem, without having a coherent Smart City Strategy. The #Warsaw2030 Strategy is focused on smart and sustainable development and was established through a bottom-up approach.

One of the key initiatives of Warsaw's smart city plan is to use data and analytics to improve public services and infrastructure. For example, the city is implementing a system that will allow it to monitor air quality in real-time and provide citizens with up-to-date information on pollution levels. Warsaw is also working to improve public transportation by implementing smart traffic management systems and developing new modes of transportation such as electric buses and bike-sharing programs. Another important aspect of Warsaw's smart city plan is the use of digital technologies to enhance citizen engagement and participation. The city has developed a number of online platforms and mobile applications that allow citizens to provide feedback, report problems, and participate in decision-making processes.

Additionally, Warsaw is working to become a more sustainable and environmentally-friendly city. The city has set ambitious goals for reducing carbon emissions and increasing the use of renewable energy sources, and it is implementing a number of initiatives to promote sustainable development and green living. Overall, Warsaw's smart city plan is focused on leveraging technology and innovation to create a more liveable, sustainable, and connected city for its citizens.

### 4.4 Vilnius

Vilnius is the capital and largest city of Lithuania, having a population of approximately 540,000 people. Vilnius is considered one of the leading smart cities in Europe, with a range of innovative technologies and initiatives in place to improve the quality of life for residents and visitors alike. The city has implemented a number of initiatives aimed at promoting sustainable living, enhancing mobility, and increasing citizen engagement. Vilnius City Municipality's Strategic Direction VILNIUS 2IN (Intelligent and Integrated, or VILNIUS 2IN) has been developed in the context of the Vilnius City Municipality Strategy 2030 and other legal acts, normative documents regulating the activities of Vilnius. The strategic direction VILNIUS 2IN sets out Vilnius' vision for digitisation in line with the Intelligent Community initiatives, using information and communication technologies to create inclusive prosperity, address social problems and enrich people's quality of life.

One of the key initiatives in Vilnius is the Smart Vilnius project, which seeks to leverage technology and data to create a more efficient and sustainable city. This includes initiatives such as smart traffic management systems, the development of a smart parking system, and the implementation of a bike-sharing program. Another important aspect of Vilnius' smart city approach is its focus on citizen engagement. The city has implemented a number of tools and platforms that enable residents to share their ideas and feedback with local authorities, including a mobile app that allows citizens to report issues and track the progress of city projects.

In addition to these initiatives, Vilnius has also made significant investments in renewable energy and energy efficiency, with a goal of becoming carbon neutral by 2050. This includes the development of a district heating system that utilizes waste heat from a local power plant, as well as the installation of solar panels on public buildings and the promotion of energy-efficient building standards. Overall, Vilnius' smart city initiatives demonstrate the city's commitment to innovation, sustainability, and citizen engagement, and have helped to make it a leading destination for those interested in exploring the future of urban living.

### 4.5 Tallinn

Tallinn is the capital city of Estonia and has a population of over 440,000 people. Tallinn is a popular destination for tourists, as well as a hub for business and commerce in the region. The city has undergone significant urban development in recent years, particularly in the areas of infrastructure, transportation, and sustainable development. Although Tallinn does not have a comprehensive Smart City strategy, the Tallinn 2035 Green and Global development plan presents the city’s vision for a better future. Tallinn was ranked the 3$^{rd}$ smartest city in Eastern Europe and 55$^{th}$ Worldwide in the Cities in Motion Index (IESE, 2020). It is known as a smart city, thanks to its innovative use of technology to improve services and infrastructure for residents and visitors. The city has implemented a number of smart city initiatives aimed at enhancing sustainability, efficiency, and quality of life.

One key example of Tallinn's smart city initiatives is the use of e-government services, which allow citizens to access public services online. This includes everything from paying taxes to accessing healthcare services, making it easier and more convenient for residents to interact with the government. Tallinn has also implemented smart transportation systems, including real-time traffic monitoring and smart traffic lights, which help to reduce congestion and improve traffic flow. Additionally, the city has introduced a bike-sharing program and has made efforts to improve pedestrian and cycling infrastructure, making it easier and safer for people to get around without relying on cars.

Tallinn has also implemented a number of energy-efficient and environmentally-friendly initiatives, such as installing smart lighting systems that adjust to the level of natural light and using renewable energy sources to power public transportation. Overall, Tallinn's smart city initiatives are aimed at improving the quality of life for residents, reducing the city's carbon footprint, and enhancing economic growth and sustainability. The city continues to be a leader in smart city development in the region and beyond.

## 5. DISCUSSIONS

Across the region, the smart city concept describes the aspirations of cities to become more dynamic, sustainable and open. In CEE countries, the concept has gained popularity in recent years and the main actors involved in the smart transformation are local and national authorities, large ICT companies, start-ups and NGOs. Critical arguments highlight the lack of experience of CEE cities in implementing large-scale urban transformations as they are hindered by the lack of financial resources and technological preparedness. Common to all CEE cities is the concentration of major smart initiatives in large cities, in areas of transportation and governance, yet missing a long-term plan or comprehensive dedicated strategy (Sikora-Fernandez, 2018). Therefore, while most strategies are relatively administrative, the inherited governance patterns inhibit citizen trust and engagement. Furthermore, as noted from the discussed case studies, the key priority of CEE urban leaders is the enhancement of infrastructure and introduction of digital tools in various services. However, the capital cities have shown increased interest in achieving sustainability through the use of innovative solutions in waste-management, energy and mobility.

Local administrations are responsible for developing and implementing smart city strategies in all five capital cities, supported by national authorities through urban policies. The smart city vision is approached through general urban development actions such as mobility, energy and e-government which can be linked to smart transformations, although apart from Prague and Vilnius, the other capitals do not specifically address it.

As follows from the official Urban Development Strategies and Smart City Strategies of the five capital cities, significant attention is put on developing innovative solutions for urban challenges. Based on the classification provided by Neirotti *et al.* (2014), the content analysis expressed in Table 2 reveals the prevalence of 'hard' infrastructure through physical and digital developments in areas of environment, transport and ICTs.

**Table 2. Main domains addressed by the SC Strategies**

| Cities | Physical Infrastructure | | Social Infrastructure | | Institutional Infrastructure | | Economic Infrastructure | | Digital infrastructure |
|---|---|---|---|---|---|---|---|---|---|
| | Environment | Urban Planning | Human capital | Quality of life | E-services | Citizen Participation | Innovation | Entrepreneur ship | ICT / IoT |
| Vilnius | x | x | x | x | x | x | x | x | x |
| Bratislava | x | | | x | x | x | | x | x |
| Prague | x | x | | x | x | x | x | | x |
| Tallinn | x | x | x | x | x | x | x | x | x |
| Warsaw | x | | x | x | x | x | | | x |

Source: developed by the authors

Furthermore, it shows a general trend of investments in smart and sustainable mobility, that can ultimately bring significant benefits to both environmental and quality of life dimensions. The digitalisation of public services is essential for accessing EU funds that support traditional infrastructure investments. Environmental issues are touched upon all cities' strategies, through initiatives that address energy efficiency, waste-management and pollution. However, urban planning, understood through increasing the accessibility to and regeneration of public and green spaces is only mentioned in the cases of Prague, Vilnius and Tallinn, revealing the comprehensive vision of these cities. The \`soft\` infrastructure includes social, governance and economic areas of interest, with an overall focus on quality of life, e-services and citizen participation. Although all cities are relevant academic centres, not all strategies address training and human capital development.

Analyzing the smart projects reported by each city, we found that most of the initiatives are focused on the mobility, ICT and sustainability dimensions and the main themes are traffic management, electric public transportation, bike sharing, parking and ticketing systems, linked to the use of mobile apps (Table 3). Initiatives in Vilnius include smart parking systems, e-governance platforms, and energy-efficient street lighting, while Tallinn focuses on e-governance platforms, digital identity solutions, and a wide range of digital services for citizens, such as e-residency and e-health. In Bratislava, projects include intelligent transportation systems, smart energy grids, and the development of a smart city app for residents, as Prague addresses the digitization of public services, open data initiatives, and smart solutions for waste management and energy consumption and Warsaw develops smart traffic management systems, energy-efficient buildings, and the implementation of IoT sensors for waste management.

In regard to vision, some particular features can be identified across the five cities. Vilnius aims to become a sustainable and citizen-centric city by leveraging technology to improve public services, enhance mobility, and promote a high quality of life. Bratislava focuses on enhancing urban mobility, promoting energy efficiency, and fostering innovation to create a smart, inclusive, and environmentally friendly city. Prague's smart city strategy aims to improve public services, ensure sustainable development, and enhance the well-being of its residents through digital innovation and citizen engagement. Tallinn focuses on digital governance, e-services, and citizen empowerment, aiming to provide seamless and efficient public services to residents and businesses. Warsaw's strategy emphasizes sustainable mobility, energy efficiency, and the use of innovative technologies to improve the urban environment and enhance the quality of life.

Moreover, sustainability is addressed through energy efficiency, sustainable transport, and green infrastructure, with initiatives such as electric vehicle charging stations and sustainable building projects in Vilnius, while Bratislava emphasizes sustainable mobility, renewable energy, and green spaces, with initiatives such as bike-sharing programs and the installation of solar panels. Prague implements initiatives for energy-efficient buildings, waste recycling, and the development of green corridors and parks to enhance sustainability. Tallinn prioritizes digital solutions for energy management, efficient public transport, and eco-friendly urban planning to reduce environmental impact and Warsaw implements initiatives for sustainable mobility, energy-efficient buildings, and urban greenery, with projects such as bike lanes and energy retrofits.

**Table 3. Main initiatives proposed in each city**

| | **Bratislava** | **Prague** | **Tallinn** | **Vilnius** | **Warsaw** |
|---|---|---|---|---|---|
| **Urban planning** | Public spaces; Green spaces | Green Spaces | 15 min City; Green Spaces | Green Spaces; Public Spaces | Public spaces; Green spaces |
| **ICT** | Mobile Apps | Mobile Apps | Open Data; Mobile Apps | Open Data; Mobile Apps | Mobile Apps |
| **Government** | E-governance | E-governance | E-governance | E-governance | E-governance; Civic Budget |

| | Bratislava | Prague | Tallinn | Vilnius | Warsaw |
|---|---|---|---|---|---|
| **People** | Social Welfare; Housing; Health | Support for senior citizens; Health | Social Welfare; Health | Social Welfare; Health | Support for senior citizens; Volunteering; Health |
| **Economy** | Tourism | Tourism; Incubators | Start-ups, Fintech | Start-ups, Fintech | R&D |
| **Sustainability** | Climate-Neutral by 2030 | Air sensors; Waste Management; Public lighting; Energy | Waste management; Energy efficiency | Climate-Neutral by 2030; Plastic ban; Public lighting | Climate-Neutral by 2030 |
| **Mobility** | Electro-mobility; Cycling; Car-share; Parking | Electro-mobility; Cycling; Car-share | Free public transport, Electro-mobility, Car-share | Electro-mobility, Car-share, Cycling | Cycling, Electro-mobility; Car-share |

Source: developed by the authors

These examples highlight the diverse strategies and initiatives undertaken by Vilnius, Bratislava, Prague, Tallinn, and Warsaw to become smarter, more sustainable, and citizen-centric cities. The comparison enables a deeper understanding of the different approaches and outcomes in their smart city journeys.

## 6. CONCLUSIONS

Smart city strategies in CEE have been shaped by the unique socio-economic and political context of each country. Factors such as historical legacy, economic development, and governance structures influence the priorities and pace of smart city implementation. CEE cities have made significant strides in adopting smart city technologies and solutions. They have implemented various initiatives such as IoT sensors, data analytics, and digital platforms to enhance urban services and improve quality of life. Vilnius, Bratislava, Prague, Tallinn, and Warsaw have embraced smart city strategies to address the complex challenges of urban development and enhance the quality of life for their residents. Through their unique approaches, these cities have demonstrated a commitment to leveraging technology, citizen engagement, and sustainable practices.

Vilnius has focused on leveraging technology to improve the efficiency of public services and enhance citizen engagement. The city has implemented various initiatives such as smart parking systems, open data platforms, and e-governance solutions. Through strong public-private partnerships and citizen involvement, Vilnius has successfully integrated smart city principles into its urban development agenda. Bratislava has embraced smart city strategies to enhance urban mobility and environmental sustainability. The city has implemented intelligent transportation systems, bike-sharing programs, and energy-efficient solutions. By integrating various data sources and engaging with citizens through digital platforms, Bratislava has made significant progress in creating a more sustainable and liveable urban environment. Prague has focused on leveraging technology and data to improve the efficiency of urban services and enhance the quality of life for its residents. The city has implemented smart solutions in areas such as waste management, energy efficiency, and transportation. Prague's strong commitment to citizen participation and collaboration has played a crucial role in the successful implementation of its smart city initiatives.

Tallinn has been at the forefront of digital innovation and citizen-centric approaches. The city has implemented various e-governance solutions, digital platforms, and smart infrastructure projects. Through its strong digital infrastructure and commitment to data-driven decision-making, Tallinn has created a thriving ecosystem of smart city services that benefit both residents and businesses. Warsaw has adopted a comprehensive smart city strategy to address various urban challenges, including mobility, energy efficiency, and environmental sustainability. The city has implemented intelligent transportation systems, energy management solutions, and smart grids. Warsaw's focus on public-private partnerships and collaboration has been instrumental in driving the successful implementation of its smart city initiatives.

Overall, these cities have demonstrated the potential of smart city strategies to transform urban environments, enhance citizen well-being, and promote sustainable development. The success of these cities lies in their ability to combine technological advancements with citizen engagement, collaborative governance, and a focus on sustainability. While each city faces unique challenges, their commitment to innovation and the adoption of smart city principles serve as examples for other cities aspiring to create more intelligent, inclusive, and sustainable urban environments.

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