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How Does U.S. Monetary Policy Affect Economic Growth?

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Abstract

Monetary policy in the United States comprises actions and communications to realize economic goals. This article examines the impact of monetary policy on economic growth in The United States of America for the period 2007-2023. The main purpose of the study is to find the relationship between monetary policy and economic growth, where the Consumer Price Index (CPI) as a proxy for inflation rate, Fed Funds Rate, and commodity prices, have any effect on Industrial production growth. In the Vector Auto-regressive (VAR) analytical technique, Industrial production growth is a dependent variable and Inflation rate (CPI), Interest rate (Fed Fund Rate) and commodity prices are the independent variables. The methodology used has allowed for a comprehensive evaluation of the relationship between time-dependent variables related to monetary policy. This study untangles the causal relationships between these variables using a Cholesky decomposition, shedding light on how monetary policy shocks spread. Additionally, it investigates the worldwide implications of American monetary policy, notably its effects on exchange rates and the dynamics of global commerce. In the end, this study provides a thorough analysis of the complex link between monetary policy and economic development, illuminating the varied implications of monetary policy choices, both nationally and internationally. To successfully navigate the increasingly complicated and linked global economic landscape, policymakers, economists, and market players must have a solid understanding of these processes.

Keywords: economic growth, impact, monetary policy, the USA

1. Introduction

Human civilisation has always been built on the constant quest for prosperity. Policymakers have used a variety of tools to pull their economic levers in the pursuit of economic development and prosperity, with monetary policy taking centre stage. A topic of utmost significance, the effect of monetary policy on economic growth affects people all over the world daily and has repercussions far beyond the walls of academics and financial organisations. This paper will discuss and elaborate on the findings and the data about the impact of monetary policy on economic growth. Monetary policy is a fundamental component in the economic strategy of countries. Having a substantial impact on the stability, expansion, and general prosperity of a country's economy. It is a series of deliberate decisions made by the central bank or monetary authority of a nation to manage the money supply, manage interest rates, and manage financial conditions with the intention of accomplishing particular economic goals. Maintaining price stability, encouraging sustainable economic growth, ensuring full employment, and supporting financial stability are frequently the major objectives of monetary policy. Due to its current direct effects on the world, the relationship between the money supply, interest rate, inflation rate and economic growth has received more attention recently than other monetary economics-related topics. A combination of tactics and tools are employed by the monetary authorities to manage the money supply in an economy and to maintain the proper level of inflation, short-term interest rates, and economic growth. The choice of a monetary policy method in a dynamic economic environment is influenced by the goals of monetary policy, which include maintaining price (inflation, exchange rates, and interest rates) and financial stability. Therefore, central banks have a responsibility to implement monetary policy and pursue price stability (CBN, 2007). The decisions made by governing authorities on the ways that they execute monetary policy have a direct influence on economic growth. Therefore, we can already see that monetary policy has an impact on economic growth. Nevertheless, it will be thoroughly explained how exactly these two correlate, implementing both theoretical and empirical points of view.

In this paper the stochastic process model Vector autoregression (VAR) has been used to capture the relationship between the variables which change over time. Using VAR made the most sense because all the variables in monetary policy are time-dependent. The results are presented on graphs, which show how every independent variable depends on another independent variable. Later in the text, it will be discussed more thoroughly. There are many variables when talking about the monetary policy. Of course, they all correlate with economic growth, giving us clear evidence that impact is present. It's crucial to keep in mind that these relationships can alter depending on the economic environment and political decisions. The correlations between these variables can also be impacted by external causes, including geopolitical developments, technical advancements, and global economic situations. To attain their economic objectives, central banks and policymakers must carefully take into account these interdependencies while developing and putting into practice monetary policy plans.

A key idea in economics is economic growth, which describes the steady rise in a nation's output of goods and services

over time. It represents a rise in a country's ability to produce wealth, jobs, and higher living conditions for its people. The annual change in a country's Gross Domestic Product (GDP), which represents the entire value of all products and services produced within its borders, is a common way to gauge economic growth.

This study explores the complex link between monetary policy and US economic growth. The interaction between the Federal Reserve, the country's central bank, and the effects their actions have on economic growth have come under intense examination and debate from economists, policymakers, and market watchers alike. The issue of how the Federal Reserve's policies affect economic growth remains crucial as the USA has navigated through times of expansion, recession, and turbulence. This investigation explores the complex link between monetary policy and US economic growth. It examines how the Federal Reserve's instruments and initiatives, such as interest rate changes, open market operations, and forward guidance, have an impact on the economy and affect how people behave in terms of borrowing, investing, and lending. The various economic difficulties the country has had, such as the 2008 financial crisis, following recovery attempts, and more recent worldwide disruptions like the COVID-19 epidemic, highlight the dynamic nature of this relationship. We want to get a deeper understanding of how the fluctuating nature of monetary policy forms the fabric of economic growth in the USA, altering the lives of its residents, and echoing throughout the global economic landscape by exploring this complex connection.

2. Review literature

The effectiveness of monetary policy is a very important issue (Boivin & Giannoni, 2006). The new tools should become part of the standard central bank toolkit (Bernanke, 2020). A well-defined communications strategy can help reduce financial vulnerabilities (Feldkircher & Huber, 2018).

Achieving macroeconomic stability is accomplished by purposefully employing monetary tools, both direct and indirect, that are at the disposal of monetary authorities, including central banks. The primary means through which monetary and price stability objectives are pursued is through the implementation of monetary policy. To accomplish preset macroeconomic objectives, the monetary authorities, typically the central bank, implement a programme of action known as monetary policy. This programme of action controls and regulates the supply of money to the public as well as the flow of credit (Dwivedi, 2005). One instrument used by the monetary authorities to control the amount of money in an economy to attain a desired level of economic growth is monetary policy.

The majority of governments hold the belief that the pace of growth in the money supply has an impact on the inflation rate, and as a result, they engage in efforts to regulate it. Consequently, governmental actions aimed at influencing the conduct of the financial sector are incorporated into the framework of monetary policy. Only economies with highly developed financial and money markets, like the developed economies of the world, can implement monetary policies with success. Here, a purposeful change in one monetary variable affects the movement of numerous other monetary variables (Ufoeze et. al., 2018).

As a result, monetary policy has come to be recognised as a crucial tool that a nation can use to maintain domestic price and exchange rate stability, which is a necessary prerequisite for achieving sustained economic growth and external viability (Adegbite & Alabi, 2013). Depending on the nation's economic situation, monetary policy may be inflationary or deflationary.

A major factor in setting inflation rates is monetary policy. According to (Lucas, 1973), inflation in every economy causes uncertainty, and greater economic uncertainty harms output growth. The development of the financial industry, as well as the vulnerable impoverished part of the population, are all negatively impacted by inflation. There is broad agreement that inflation, especially at moderate levels, hurts real growth.

The World Bank carried out a study to distinguish the effects of real interest rates and inflation on growth. This study offers data from a sample of 20 nations showing how real interest rates and inflation rates affect growth rates. Growth is statistically significant and favourably impacted by the real interest rate. However, the coefficient on the rate of inflation is when inflation is taken into account. This shows that regimes with stable nominal interest rates were responsible for the positive relationship between the real rate of interest and growth (World Bank, 1993).

According to Mohsin and Axel's 2005 research, Pakistan's real per capita GDP and inflation are inversely related. According to the study's findings, the threshold for direct inflation growth lies between 4 and 9 per cent, and the threshold for inflation-financial development is between 3 and 6 per cent. It is further advised that SBP adopt a 5 per cent inflation objective in light of this.

For quite some time, researchers have shown a keen interest in examining the interplay among inflation, interest rates, and economic growth. An examination of this relationship within the context of the United States reveals that the surges in M2 (or M1) growth rates during the 1970s and 1980s can fully explain the inflation experienced in those decades. Conversely, the return to relatively low inflation rates in the 1990s can be attributed to the comparatively modest average rate of money supply growth during that period. Notably, inflation during the 1990s was approximately 3.5 percentage points lower on average compared to the 1970s and 1980s, with M2 growth lagging by approximately 5% (Alvarez, 2001).

All of the discussed material demonstrates that factors affecting monetary policy, such as the money supply, interest rates, and inflation rate, also have an impact on economic growth.

3. Data and methodology

The variables included in this study encompass key characteristics of the American economy and its monetary policy environment, and FRED offers a comprehensive database that permits a full examination of economic events.

The Fed Fund Rate, which is a key factor in determining the interest rate environment and affecting economic activity, the Industrial Production Index, which measures the strength of the manufacturing, mining, and utility sectors, and Commodity Prices, which shows the prices of essential raw materials affected by geopolitical developments and global economic conditions, are among the variables that were chosen.

The technique used in this research spans the crucial time frame of January 2007 to June 2023, which includes the difficult years of the 2007–2008 Financial Crisis. The study uses Vector Auto Regressions (VARs), a paradigm developed by Christopher Sims in 1980 that enables the investigation of dynamic interactions between variables, to solve the challenges of macroeconomic analysis.

A useful econometric technique for examining shock propagation and the causal relationships between macroeconomic variables in a multivariate system is the Cholesky Decomposition. It aids in identifying one-way causal relationships and offers perceptions into how monetary policy components, such as the Federal Funds Rate, CPI, and industrial output growth, interact with one another in a more general economic setting.

In this article, the effects of a monetary policy shock are further examined, with a focus on the assessment of how significant macroeconomic variables react to such shocks. Beginning with a description of monetary policy, the analysis makes the assumption that the monetary policy shock is orthogonal to other factors, laying the groundwork for understanding its effects on the economy. Overall, this research uses data and sophisticated econometric tools to illuminate the complex interaction between monetary policy and a range of economic indicators, providing insightful information on the dynamics of the American economy during a pivotal time.

The preparation and construction of the VAR model, the analysis of the lag structure, and the estimation of impulsive reactions to economic shocks are all key components of this area of the dissertation results and discussion. The evaluation of the stationarity of time series data, a key presumption in time series modelling, is a crucial function of unit root testing. These tests aid in determining if a variable has unit roots, which would indicate non-stationarity. Three variables in this study became stationary through the first difference, whereas one variable, consumer price increase, remained stationary at the level after unit root tests were performed on the variables that were chosen.

It is essential to choose the right lag structure for the VAR model. The VAR Lag Order Selection Criteria were used in this study, and the three-lag model was chosen based on the AIC and FPE values. To guarantee stationarity, variables were also transformed, including taking the log form and applying differencing.

After creating the final VAR model, the study focused on determining how economic shocks affected the key endogenous variables. The nonlinear functions of the VAR parameters were used to estimate the impulse response functions, which show how variables react to shocks across time. Figure 1's visual representation of these impulse reactions offers insightful information about the dynamic interactions between the Fed Fund Rate and numerous economic indices.

The findings of the impulse reactions demonstrated that industrial production, CPI growth, and the logged CPI were all significantly impacted by an initial shock to the Fed Fund Rate. In the near term, these impacts were primarily unfavourable, and over time, the influence steadily decreased until it was nil. The investigation also showed how the Fed Fund Rate shock affected it, showing a slow recovery to its initial level.

The Federal Reserve Economic Data (FRED), a comprehensive database kept by the Federal Reserve Bank of St. Louis, served as the source of the data for this dissertation. FRED makes a variety of economic and financial data series available, enabling in-depth examination of economic events. The essential features of the American economy and its monetary policy environment are captured by the variables chosen for this study.

This study uses the Consumer Price Index (CPI), a key metric of inflation, as a proxy for price stability. The CPI calculates the average change in prices that urban consumers pay overtime for a selection of goods and services. A higher CPI indicates more inflation, which may affect consumer purchasing power and the general state of the economy (Bureau of Labour Statistics, 2021a, 2021b). In this study, consumer price growth is used as a proxy for inflation.

An important indicator of the strength of the manufacturing sector is the Industrial Production Index. It stands for the tangible results of the manufacturing, mining, and utility sectors. Economic activity changes, such as periods of expansion or contraction in the industrial sectors, can be reflected in changes in the industrial production index (Federal Reserve Board, 2021).

The federal funds rate refers to the interest rate at which depository institutions, such as banks and credit unions, lend their reserve holdings to other depository institutions overnight. The Federal Reserve uses it as a crucial policy tool to affect the overall interest rate environment and, in turn, the state of the economy. The federal funds rate can affect economic activity, investment choices, and borrowing costs (Federal Reserve Board, 2021).

Commodity prices show the price of necessary raw commodities like metals, agricultural goods, and oil. Geopolitical developments, economic conditions, and global supply and demand dynamics all have an impact on these prices. Changes in commodity prices can have a big impact on trade balances, production costs, and inflation.

Based on monetary policy indicators implemented by the Federal Reserve of the USA to sustain economic growth, this analysis spans the period from January 2007 to June 2023. We chose this period because it was one in which the American

economy encountered one of the biggest difficulties any country has faced; The Financial Crisis of 2007–2008.

Vector autoregressions (VARs), a brand-new macro-econometric paradigm introduced by Christopher Sims in 1980, held a lot of promise at the time. A VAR is an n-equation, n-variable linear model in which the present and lagged values of each variable, along with the values of the other $n - 1$ variables, are used to explain each variable in turn. The statistical toolkit that came with VARs was simple to use and understand, and it provided a systematic technique to capture rich dynamics in various time series. VARs held out the promise of offering a consistent and reliable method for data description, forecasting, structural inference, and policy analysis, as Sims (1980) and others emphasised in several key early papers.

Since it is assumed in VAR that the variables are at the same time related, utilising a single equation framework was not appropriate for this study due to the endogeneity issue. They often assume that all variables are endogenous a priori. By doing so, they address Sims' criticism that some of the variables' exogeneity assumptions in simultaneous equations models are ad hoc and frequently not supported by well-defined theories.

A useful econometric method known as the Cholesky decomposition helps researchers to separate the connections between the variables in a multivariate system. When considering how monetary policy affects economic development, Cholesky decomposition is a useful method for examining shock propagation and the causal connections between important macroeconomic variables. The relevance of Cholesky's decomposition in enhancing our comprehension of how monetary policy elements like the Federal Funds Rate, Consumer Price Index (CPI), and industrial output growth interact within a more comprehensive economic framework is examined in this literature review.

In a vector autoregression (VAR) framework, the Cholesky decomposition matrix factorization method is a key tool for modelling the dynamic interactions between variables. It facilitates the discovery of unidirectional causal linkages by converting the variables' covariance matrix into a smaller triangular matrix. This decomposition is particularly helpful in determining the "shock order," which describes how variables are affected by shocks in order, according to where they are located in the lower triangular matrix.

4. The consequences of a monetary policy shock

This section commences by explaining our methodology for estimating a monetary policy shock. Subsequently, we present our findings regarding how key macroeconomic indicators react to such a monetary policy shock.

The starting point of our analysis is the following characterization of monetary policy:

$$R_t = f(\Omega_t) + \epsilon_t$$

In this context, we have the federal funds rate denoted as R_t , with a linear relationship represented by a function, and an information set denoted as Ω . Additionally, we introduce the monetary policy shock as ϵ_t . We assume that the Federal Reserve (Fed) adjusts money growth as needed to ensure that equation (1) remains valid. Our fundamental identification assumption is that ϵ_t is independent of the elements in Ω . Below, we explain the variables within Ω and further clarify the rationale behind this orthogonality assumption.

5. Results and discussion

Unit root test

In time series econometrics, the stationarity of a collection of time series data is evaluated using a statistical technique called a unit root test. Since stationarity means that the statistical characteristics of the data do not vary over time, it is a crucial presumption in many time series models. Researchers can use unit root tests to identify whether a time series contains a unit root, which is a sign of non-stationarity. To prepare variables for the VAR model, first a unit root test is applied to make the variables stationary in the model. The following table shows the results of stationarity tests for four variables:

| Variable | Level | First Difference | Second Difference |
|-----------------------------|-------|------------------|-------------------|
| Fed Fund Rate | | ● | |
| Industrial Production Index | | ● | |
| Consumer Price Growth | ● | | |
| Commodity prices | | ● | |

Three variables including the fed fund rate, industrial production index, and commodity prices are stationary through the first difference and one variable consumer price growth is stationary in level. The results of the unit root test are presented in the appendix.

Vector Autoregression (Var)

The order, or how many previous periods the model will use, is a defining feature of VAR models. The value of a variable at a previous point in time is known as a lag. Therefore, a VAR model that contains lags for the most recent p periods is referred regarded as a pth-order VAR in general. To determine the number of lags in the model, VAR Lag Order Selection Criteria are applied, and the following table shows the results for lag structure:

VAR Lag Order Selection Criteria

Endogenous variables: D(FEDRATE) D(LOG(IPI)) CPIGROWTH D(LOG(CP))

Exogenous variables: C

Date: 09/03/23 Time: 15:25

Sample: 2007M01 2023M06

Included observations: 189

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|---------|---------|----------|-----------|-----------|-----------|
| | 1165.53 | | | - | - | - |
| 0 | 3 | NA | 5.40e-11 | 112.29135 | 12.22275 | 12.26356 |
| | 1290.70 | 243.715 | | - | - | - |
| 1 | 2 | 6 | 1.70e-11 | 113.44658 | 13.10354* | 13.30761 |
| | 1330.39 | 75.6060 | | - | - | - |
| 2 | 5 | 1 | 1.32e-11 | 113.69730 | 13.07983 | 13.44715* |
| | 1350.32 | 37.1099 | 1.27e- | - | - | - |
| 3 | 1 | 5 | 11* | 13.73884* | 12.84693 | 13.37751 |
| | 1359.54 | 16.7877 | | - | - | - |
| 4 | 4 | 3 | 1.37e-11 | 113.66713 | 12.50079 | 13.19462 |
| | 1376.49 | 30.1372 | | - | - | - |
| 5 | 6 | 7* | 1.35e-11 | 113.67721 | 12.23643 | 13.09352 |
| | 1391.29 | 25.6890 | | - | - | - |
| 6 | 9 | 4 | 1.38e-11 | 113.66454 | 11.94933 | 12.96967 |
| | 1403.72 | 21.0302 | | - | - | - |
| 7 | 0 | 9 | 1.43e-11 | 113.62667 | 11.63702 | 12.82061 |
| | 1414.81 | 18.3153 | | - | - | - |
| 8 | 5 | 7 | 1.52e-11 | 113.57476 | 11.31068 | 12.65753 |

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Therefore, according to AIC and FPE results, 3 lags are considered in the model. According to the results of the tests, the final model for VAR is constructed, and for variables industrial production index and commodity price, the log form is applied. However, the other two variables fed fund rate and consumer price growth have not been logged in the model. Moreover, all variables except consumer price growth are applied with one difference in the model to be stationary. Finally, the VAR model is applied with 3 lags, and the results are presented in the following table:

Vector Autoregression Estimates

Date: 09/03/23 Time: 16:56

Sample (adjusted): 2007M05 2023M06

Included observations: 194 after adjustments

Standard errors in () & t-statistics in []

| | D(LOG(IPI)) | D(FEDRATE) | CPIGROWTH | D(LOG(CP)) |
|------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| D(LOG(IPI (-1))) | 0.084330 (0.07665) [1.10025] | -0.565532 (0.81870) [-0.69077] | -3.357675 (1.99371) [-1.68414] | -0.054352 (0.06580) [-0.82599] |

| | | | | |
|------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| D(LOG(IPI (-2))) | -0.248805 (0.07286) [-3.41492] | -0.452824 (0.77823) [-0.58186] | 1.195128 (1.89517) [0.63062] | 0.052468 (0.06255) [0.83882] |
| D(LOG(IPI (-3))) | -0.072447 (0.07183) [-1.00858] | 0.244996 (0.76726) [0.31931] | 0.974348 (1.86845) [0.52148] | 0.073572 (0.06167) [1.19304] |
| D(FEDRATE (-1)) | 0.036678 (0.00682) [5.37534] | 0.671988 (0.07288) [9.21990] | 0.386515 (0.17749) [2.17767] | 0.011513 (0.00586) [1.96536] |
| D(FEDRATE (-2)) | -0.023110 (0.00839) [-2.75316] | -0.137114 (0.08966) [-1.52927] | -0.194716 (0.21834) [-0.89180] | -0.023917 (0.00721) [-3.31890] |
| D(FEDRATE (-3)) | 0.009364 (0.00754) [1.24150] | 0.260460 (0.08056) [3.23296] | -0.131163 (0.19619) [-0.66855] | 0.003062 (0.00648) [0.47283] |
| CPIGROWTH (-1) | -0.010230 (0.00471) [-2.17097] | -0.107219 (0.05033) [-2.13019] | 0.387887 (0.12257) [3.16456] | -0.000988 (0.00405) [-0.24432] |
| CPIGROWTH (-2) | -0.004329 (0.00483) [-0.89660] | 0.043706 (0.05157) [0.84743] | -0.258489 (0.12560) [-2.05809] | -0.006801 (0.00415) [-1.64067] |
| CPIGROWTH (-3) | -0.002839 (0.00433) [-0.65586] | 0.068675 (0.04624) [1.48518] | 0.127691 (0.11261) [1.13397] | 0.005264 (0.00372) [1.41642] |
| D(LOG(CP (-1))) | 0.453994 (0.14430) [3.14609] | 3.466113 (1.54138) [2.24871] | 8.142686 (3.75360) [2.16930] | 0.462545 (0.12389) [3.73358] |
| D(LOG(CP (-2))) | 0.280325 (0.13745) [2.03946] | 2.273613 (1.46817) [1.54860] | 8.025999 (3.57532) [2.24483] | 0.476966 (0.11800) [4.04196] |
| D(LOG(CP (-3))) | 0.001308 (0.14028) [0.00933] | -5.662430 (1.49836) [-3.77909] | -7.378939 (3.64884) [-2.02227] | -0.297016 (0.12043) [-2.46629] |
| C | 0.002054 (0.00128) [1.59853] | -0.000226 (0.01372) [-0.01646] | 0.131708 (0.03342) [3.94126] | 0.001162 (0.00110) [1.05379] |
| R-squared | 0.305891 | 0.532096 | 0.406259 | 0.397425 |
| Adj. R-squared | 0.259873 | 0.501075 | 0.366895 | 0.357476 |
| Sum sq. resids | 0.027249 | 3.108920 | 18.43689 | 0.020084 |
| S.E. equation | 0.012270 | 0.131059 | 0.319157 | 0.010534 |
| F-statistic | 6.647164 | 17.15261 | 10.32055 | 9.948139 |
| Log likelihood | 585.1742 | 125.6835 | -46.98411 | 614.7683 |
| Akaike AIC | -5.898703 | -1.161685 | 0.618393 | -6.203797 |
| Schwarz SC | -5.679723 | -0.942705 | 0.837373 | -5.984817 |
| Mean dependent | 1.50E-05 | -0.000876 | 0.201759 | 0.002027 |
| S.D. dependent | 0.014262 | 0.185544 | 0.401113 | 0.013141 |

| | |
|---|-----------|
| Determinant resid covariance (dof adj.) | 9.45E-12 |
| Determinant resid covariance | 7.16E-12 |
| Log likelihood | 1388.170 |
| Akaike information criterion | -13.77495 |
| Schwarz criterion | -12.89903 |
| Number of coefficients | 52 |

If we have successfully identified an economic shock using one of the methods previously discussed, the question arises: how can we gauge its impact on the variables we are concerned with? The prevalent approach for estimating the impulse responses to a shock typically involves employing nonlinear functions (particularly for horizons extending beyond one) derived from the estimated VAR parameters. We can express the impulse response of variable Y_t at horizon $t+h$ to a shock to ϵ_{jt} as:

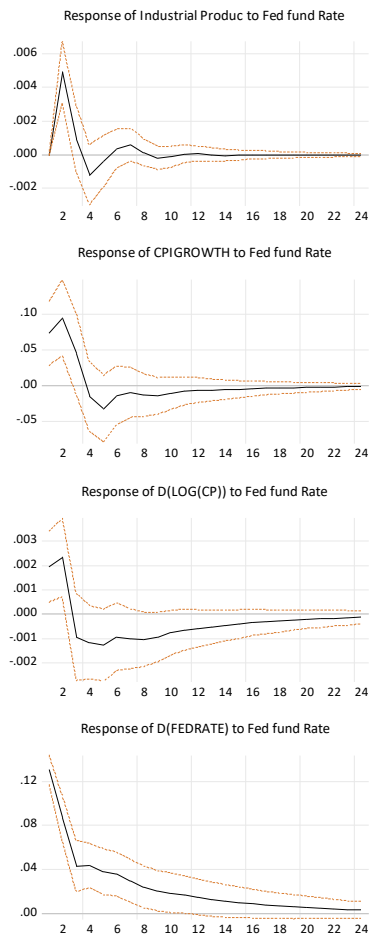
$$\frac{\partial Y_{i,t+h}}{\partial \epsilon_{j,t}} = d_{ijh}$$

These d_{ijh} parameters are nonlinear functions of the VAR parameters.

Figure 1 illustrates the impulse responses generated by the recursive VAR analysis. In the top row, we observe the impact of a one standard deviation alteration in the fed fund rate on the three variables within the recursive VAR framework, using coefficients derived from real-world data. Additionally, we have included 1 standard error bands around these responses, providing an estimated 66 percent confidence interval for each of these impulse responses.

Figure 1. Response to Cholesky One S.D. Innovations

Response to Cholesky One S.D. (d.f. adjusted) Innovations
± 2 analytic asymptotic S.E.s



Source: Authors

This article adds significant knowledge to the area of economics by providing a nuanced view of the forces that influence economic outcomes via thorough investigation and methodical analysis. Overall, it emphasises the importance of empirical research and quantitative methodologies in solving the puzzles of economic phenomena and laying the groundwork for reasoned policymaking.

Conclusion

This article has explored the complex connection between monetary policy and economic growth. Monetary policy has a significant impact on how a country's economy develops, impacting elements like inflation, interest rates, and general economic stability. The methods and choices used by policymakers in the area of monetary policy have a big impact as they try to guide their economies in the direction of prosperity.

This article adds significant knowledge to the area of economics by providing a nuanced view of the forces that influence economic outcomes via thorough investigation and methodical analysis. Overall, it emphasises the importance of empirical research and quantitative methodologies in solving the puzzles of economic phenomena and laying the groundwork for reasoned policymaking.

We have looked at the complexity of monetary policy throughout this article, using the US as a shining illustration of this dynamic relationship. The effects of the Federal Reserve's actions on economic growth have been closely examined, ranging from interest rate changes to open market operations. Notably, historical occurrences like the COVID-19 epidemic and the financial crisis of 2008 have brought attention to how constantly changing this connection is. Furthermore, the research we have conducted has shown that a thorough knowledge of how different economic factors interact is necessary for monetary policy to be successful. We have been able to capture the complex dynamics of these interactions across time by using econometric approaches like Vector Autoregression (VAR).

The relevance of monetary policy in determining economic development remains unquestionably significant as we traverse a period characterised by unprecedented economic complexity and unpredictability, including the emergence of digital currencies and changing global economic dynamics. The choices made by central banks have an impact not only on the economies of the countries in which they operate but also on the whole world. As we continue our consideration of the transmission channels of monetary policy, it becomes clear that the literature provides a thorough understanding of how policy actions affect inflation and economic production. For instance, it is well known that the exchange rate channel has a considerable impact on economic expansion. Although there may be some opposing opinions, the general agreement points to the fact that changes in exchange rates affect how well economies perform.

Similarly, the credit channel has drawn a lot of interest since most studies show a link between increasing credit levels and economic development. However, it's critical to recognise the channel's complexity since some research has pointed up possible disadvantages, such as payment defaults and a lack of adequate government monitoring, which might temper the channel's beneficial impacts on GDP. The interest rate channel, in contrast, offers a more complex picture. While evidence demonstrates that monetary policy may affect market interest rates, its effect on investment expenditure may not always be clear-cut. According to some research, there may not be a substantial association between market interest rates and investment, suggesting that monetary policy may not be able to effectively support economic growth through this route.

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Appendix

The results of the unit root test

Null Hypothesis: D(IPI) has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=14)

| | t-Statistic | Prob. * |
|--|-------------|------------|
| Augmented Dickey-Fuller test statistic | 10.75431 | 0 |
| Test critical values: | | |
| 1% level | -3.463924 | |
| 5% level | -2.876200 | |
| 10% level | -2.574663 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(IPI,2)
 Method: Least Squares
 Date: 09/02/23 Time: 21:00
 Sample (adjusted): 2007M04 2023M06
 Included observations: 195 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| D(IPI(-1)) | 0.948796 | 0.088225 | 10.75431 | 0.0000 |
| D(IPI(-1),2) | 0.213735 | 0.070488 | 3.032219 | 0.0028 |
| C | 0.005978 | 0.090553 | 0.066016 | 0.9474 |
| R-squared | 0.418138 | Mean dependent var | | 0.005305 |
| Adjusted R-squared | 0.412077 | S.D. dependent var | | 1.648983 |
| S.E. of regression | 1.264377 | Akaike info criterion | | 3.322301 |
| Sum squared resid | 306.9405 | Schwarz criterion | | 3.372654 |
| Log likelihood | 320.9243 | Hannan-Quinn criter. | | 3.342688 |
| F-statistic | 68.98756 | Durbin-Watson stat | | 1.992690 |
| Prob(F-statistic) | 0.000000 | | | |

Null Hypothesis: D(CP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=14)

| | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | 7.835514 | 0.0000 |
| Test critical values: | | |
| 1% level | -3.463749 | |
| 5% level | -2.876123 | |
| 10% level | -2.574622 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(CP,2)

Method: Least Squares

Date: 09/02/23 Time: 21:02

Sample (adjusted): 2007M03 2023M06

Included observations: 196 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-----------------------|-------------|------------|-------------|----------|
| D(CP(-1)) | -0.478892 | 0.061118 | -7.835514 | 0.0000 |
| C | 0.206039 | 0.168330 | 1.224019 | 0.2224 |
| R-squared | 0.240393 | | | |
| Adjusted R-squared | 0.236478 | | | |
| S.E. of regression | 2.323821 | | | |
| Sum squared resid | 1047.628 | | | |
| Log likelihood | 442.3766 | | | |
| F-statistic | 61.39528 | | | |
| Prob(F-statistic) | 0.000000 | | | |
| Mean dependent var | | | | 0.013240 |
| S.D. dependent var | | | | 2.659450 |
| Akaike info criterion | | | | 4.534455 |
| Schwarz criterion | | | | 4.567905 |
| Hannan-Quinn | | | | 4.547997 |
| Durbin-Watson stat | | | | 2.179880 |

Null Hypothesis: D(US_FEDERAL_FUNDS_RATE__MONTHLY_AVERAGE__NADJ) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=14)

| | t-Statistic | Prob. * |
|--|-------------|------------|
| Augmented Dickey-Fuller test statistic | 6.158503 | 0.000 |
| Test critical values: | | |
| 1% level | -3.463749 | |
| 5% level | -2.876123 | |
| 10% level | -2.574622 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(US_FEDERAL_FUNDS_RATE__MONTHLY_AVERAGE__NADJ,2)

Method: Least Squares

Date: 09/02/23 Time: 21:07

Sample (adjusted): 2007M03 2023M06

Included observations: 196 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--|-------------|-----------------------|-------------|----------|
| D(US_FEDERAL_FUNDS_RATE__MONTHLY_AVERAGE__NADJ (-1)) | 0.327085 | 0.053111 | 6.158503 | 0.0000 |
| C | 0.000266 | 0.009779 | 0.027207 | 0.9783 |
| R-squared | 0.163530 | Mean dependent var | | 5.10E-05 |
| Adjusted R-squared | 0.159219 | S.D. dependent var | | 0.149301 |
| S.E. of regression | 0.136900 | Akaike info criterion | | 1.128978 |
| Sum squared resid | 3.635882 | Schwarz criterion | | 1.095528 |
| Log likelihood | 112.6398 | Hannan-Quinn criter. | | 1.115436 |
| F-statistic | 37.92716 | Durbin-Watson stat | | 2.028147 |
| Prob(F-statistic) | 0.000000 | | | 0 |

Null Hypothesis: CPIGROWTH has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag = 14)

| | t-Statistic | Prob. * |
|--|-------------|------------|
| Augmented Dickey-Fuller test statistic | -7.637387 | 0.000 |
| Test critical values: | | |
| 1% level | -3.463749 | |
| 5% level | -2.876123 | |
| 10% level | -2.574622 | |

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(CPIGROWTH)
 Method: Least Squares
 Date: 09/02/23 Time: 21:03
 Sample (adjusted): 2007M03 2023M06
 Included observations: 196 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| CPIGROWTH (-1) | 0.503835 | 0.065970 | 7.637387 | 0.0000 |
| D (CPIGROWTH (-1)) | 0.162477 | 0.070905 | 2.291467 | 0.0230 |
| C | 0.104134 | 0.027276 | 3.817790 | 0.0002 |
| R-squared | 0.238229 | Mean dependent var | | 0.001082 |
| Adjusted R-squared | 0.230335 | S.D. dependent var | | 0.375638 |
| S.E. of regression | 0.329549 | Akaike info criterion | | 0.633007 |
| Sum squared resid | 20.96034 | Schwarz criterion | | 0.683182 |
| Log likelihood | 59.03465 | Hannan-Quinn criter. | | 0.653320 |
| F-statistic | 30.17845 | Durbin-Watson stat | | 1.997364 |
| Prob (F-statistic) | 0.000000 | | | |

Analyzing the Effectiveness of English Language Training: Pedagogical Strategies and Classroom Technological Innovations

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Abstract

This study investigates the effectiveness of English language teacher training programs in an Albanian private school, focusing on their impact on pedagogical strategies and classroom dynamics. Conducted in Tirana, Albania, the research explores the developmental journey of teachers over an extended timeframe. The central problem addressed is the gap between traditional teaching methods and the evolving educational needs requiring the integration of advanced technological tools. The significance of the study lies in its potential to enhance the quality of English language education through improved teacher training. The central hypothesis is that comprehensive teacher training programs significantly enhance instructional practices and increase student engagement through the integration of advanced technological tools. A mixed-methods approach is employed, combining quantitative and qualitative data collection. Surveys are administered to gather teachers' perceptions and experiences regarding the training programs. Classroom observations are conducted to provide a detailed, real-time analysis of teaching practices and student interactions. These instruments aim to uncover the relationship between teacher training, technological integration, and overall teaching quality. The training approaches analyzed include the use of smartboards, educational TVs, iPads, and online platforms, which have become integral to modern teaching methodologies. By evaluating the effects of these technologies on teaching practices and student engagement, the study aims to offer a comprehensive understanding of the evolving educational landscape. Expected outcomes include evidence that well-designed teacher training programs, particularly those incorporating advanced technologies, lead to improved pedagogical strategies and enhanced classroom dynamics. Ultimately, the goal is to facilitate the continuous growth and development of English language educators in similar educational contexts, fostering an ongoing cycle of improvement and adaptability.

Keywords: Classroom dynamics, Classroom observations, Continuous improvement, Teacher training, Pedagogical strategies, Technological tools.

1. Introduction

Teacher training programs are crucial in enhancing the effectiveness of educators. They directly influence the quality of teaching by shaping teachers' skills, knowledge, and abilities. Well-designed programs provide educators with necessary tools and strategies, contributing to their professional growth and enabling them to meet diverse student needs and adapt to changes in education. The study specifically examines English language teacher training programs in an Albanian private school. It emphasizes the impact of pedagogical strategies on shaping classroom dynamics within this context. The narrative highlights a shift from traditional teaching methods to the integration of advanced technological tools in education. This transformation is seen as significant and warrants investigation into how it influences pedagogical approaches and overall teaching quality. There is a global demand for proficient English language skills, underscoring the importance of preparing and developing English language teachers. The study aims to explore how teacher training programs contribute to meeting this demand and improving classroom practices. This study aims to critically evaluate the effectiveness of English language teacher training programs amidst advancements in teaching methodologies and technology integration. It seeks to understand how these changes impact pedagogical strategies and overall teaching quality in our school's context.

2. Literature review: Overview of teacher training

Ancient China (Han Dynasty, 206 BCE - 220 CE):

- Confucius formalizes teacher training emphasizing moral education and knowledge transmission.

Ancient Greece (5th century BCE):

- Plato and Aristotle shape educational principles, emphasizing the role of teachers.

Medieval Period (8th - 14th centuries):

- Islamic Golden Age establishes Madrasas focusing on teacher training.

- Medieval Europe sees emergence of monastic and cathedral schools.

Renaissance and Early Modern Era (17th century):

- Comenius advocates for formal teacher training.

18th-19th centuries:

- Normal schools are established, marking formalization of teacher education.

20th century:

- Progressive Education Movement led by John Dewey promotes experiential learning.
- Colleges and universities globally offer structured teacher education programs.

Late 20th century to present:

- Globalization of teacher training through exchange programs and international collaborations.
- Emphasis on continuous professional development and adaptation to technological advancements.

2.1 Studies on teacher training

Johnson (2017): Investigates the impact of technology-oriented training on language teaching practices. Johnson's research provides valuable insights into how teachers adapt to modern pedagogical tools, highlighting the importance of integrating technology in teacher training programs to enhance classroom effectiveness.

Brown (2018): Conducts a longitudinal study on the sustained effects of professional development in language education. Brown's findings offer a nuanced understanding of how well-designed training initiatives can lead to lasting benefits, influencing both teaching practices and student learning outcomes over time.

Smith (2019): Explores the integration of culturally responsive teaching methods within professional development programs. Smith's research underscores the significance of cultural competence in teacher training, emphasizing its role in creating inclusive and effective learning environments for diverse student populations.

Wang (2020): Compares traditional versus immersive training models in language education. Wang's comparative analysis sheds light on the varying impacts of different training approaches, providing valuable insights into which methods are most effective for preparing educators in multilingual and multicultural classroom settings.

Darling-Hammond (2017): Advocates for adopting a global perspective in teacher education. Darling-Hammond emphasizes the importance of drawing inspiration from international best practices to enrich the design and implementation of teacher training programs, aiming for educational excellence across diverse contexts.

National Board Certification program: Recognized for its rigorous standards and profound impact on teacher effectiveness. This program sets a benchmark for excellence in teacher training, focusing on advanced subject knowledge and instructional skills to elevate teaching practices in the contemporary educational landscape.

Teach For All: A global network emphasizing cultural sensitivity, community engagement, and ongoing support for teachers in underserved communities. Teach For All's success lies in its holistic approach to teacher training, tailored to local contexts while maintaining a commitment to educational equity and excellence.

3. Methodology, participants

Survey Method

A survey was administered to 20 teachers across different grade levels (1st to 12th grade) in Solution Academy private school. The participant distribution was as follows:

- 5 teachers with 1-5 years of experience.
- 12 teachers with 6-10 years of experience.
- 3 teachers with 10+ years of experience.

3.1 Survey instrument

The survey instrument was designed to gather insights into teachers' perceptions of the effectiveness of the training programs, focusing on the integration of pedagogical strategies and the observed impact on classroom dynamics. The questionnaire included both closed-ended and open-ended questions.

Data Collection Timeline:

The timeline for data collection was approximately two weeks including the distribution of the survey, the administration (which lasted only 40 min), and the collection and analysis of the survey. On the other hand, the period covered by observations was more extended. Observations were held over the lesson periods with peers.

3.2 Quantitative and qualitative approach

This research employed both quantitative and qualitative approaches. The quantitative part involved gathering numerical data, while the qualitative aspect focused on collecting and analyzing non-numerical data to understand concepts, opinions, or experiences in-depth.

3.3 Observation method

Peer Observations

Observations played a crucial role in the study, providing firsthand insights into the application of training strategies in the classroom. Peer observations were conducted as part of the ongoing professional development culture within the school. Teachers were encouraged to observe each other, implementing activities learned during the training sessions.

Selection of Participants

The researcher had the opportunity to observe over 10 colleagues during various classroom activities over the course of several years. The selection aimed to cover a diverse range of grade levels and teaching experiences.

3.4 Limitations

Single-Site Context: The study focused on a single private school in Albania, limiting the generalizability of the results to other educational contexts. The unique characteristics of this school, including its size, resources, and demographic composition, may influence the transferability of findings to different settings.

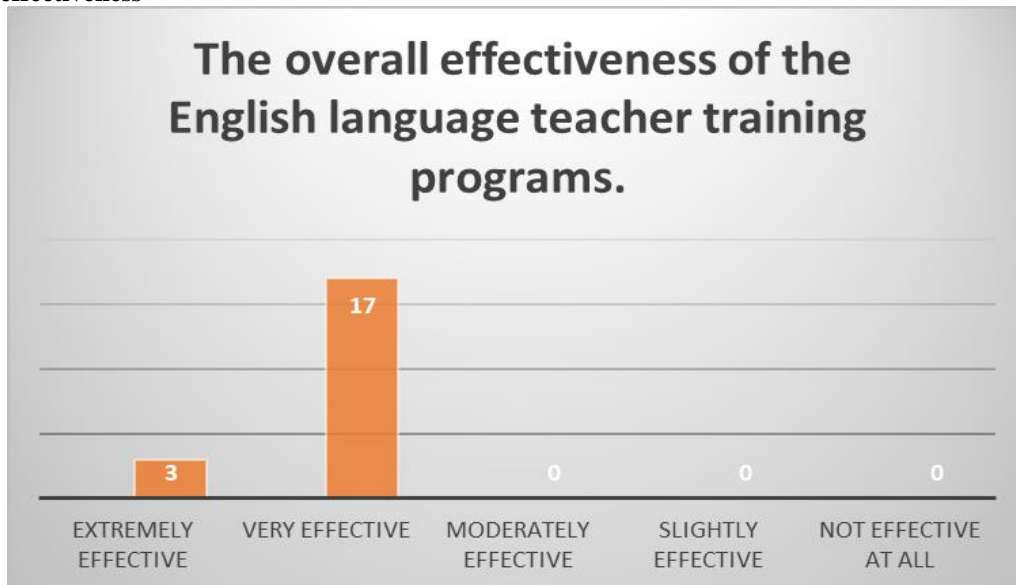
Sample Size: The sample size for both surveys and observations is relatively small, consisting of 10 participants and 35 observed classrooms. While efforts were made to ensure diversity in the selection, the small sample size may impact the external validity of the study.

Temporal Constraints: It is important to acknowledge that the duration of the study may limit the generalizability of the findings. The effects of teacher training programs may vary over a longer period of time, and the study's timeframe might not capture any potential long-term impacts accurately. Therefore, the findings should be interpreted within the context of the study's specific timeframe.

3.5 Data analysis and results

Before delving into the specific findings, a brief overview of the participant demographics is provided. This includes the distribution of teachers across different experience levels (1-5 years, 6-10 years, and 10+ years) and their representation in various grade levels.

Overall effectiveness



The majority of teachers (17 out of 20) rated the training programs as "Very effective" (4).

Three teachers chose the highest rating, "Extremely effective" (5).

"Very Effective" (Rating 4): 17 teachers out of 20 (85%)

"Extremely Effective" (Rating 5): 3 teachers out of 20 (15%)

Novice Teachers:

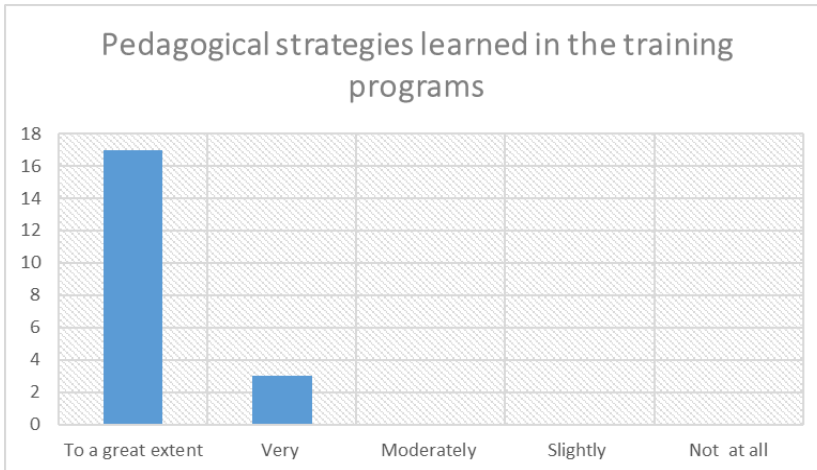
All three teachers who rated the training programs as "Extremely effective" (5) were novice teachers with 1-3 years of experience.

Interpretation:

The fact that all novice teachers provided the highest rating indicates that the training programs might be particularly beneficial for teachers with fewer years of experience.

3.6 Impact of pedagogical strategies

To what extent do you feel the pedagogical strategies learned in the training programs have positively influenced your classroom interactions?



3 out of 20 responded with “very positively influenced” by the pedagogical strategies learned in the training programs (Experienced teachers with 10 years or more of experience).

17 out of 20 responded with "To a Great Extent".

Interpretation:

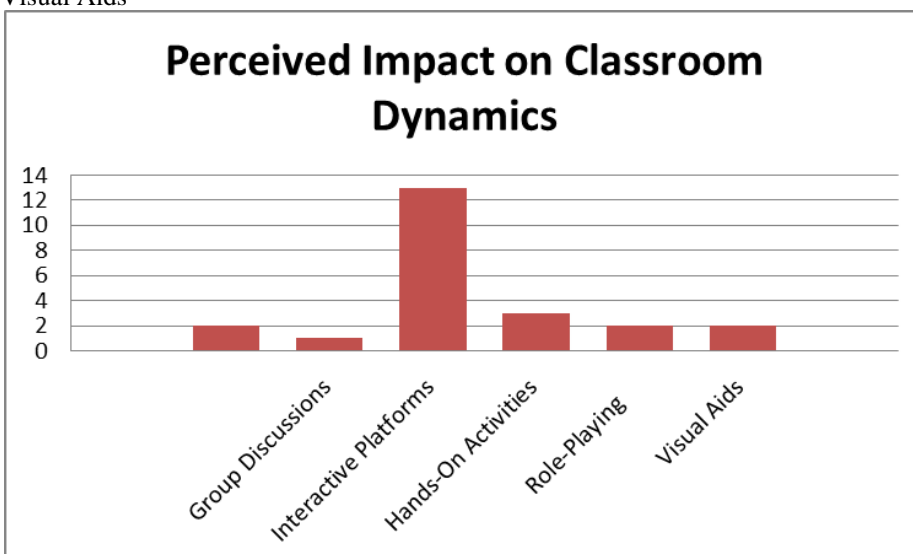
The majority of teachers, particularly those with less than 10 years of experience, rated the impact of pedagogical strategies as "To a Great Extent" (5). This indicates a high level of perceived positive influence on classroom interactions.

Experienced teachers, while also recognizing the positive influence (rating 4), may have slightly different perspectives or expectations, possibly due to their extensive experience and existing pedagogical knowledge.

3.7 Perceived impact on classroom dynamics

Please rank the following pedagogical strategies from 1 (most effective) to 6 (least effective) in enhancing student engagement:

- Problem-Based Learning
- Group Discussions
- Interactive Platforms
- Hands-On Activities
- Role-Playing
- Visual Aids



Overall Interpretation:

Interactive platforms are widely perceived as the most effective pedagogical strategy for enhancing student engagement in this school.

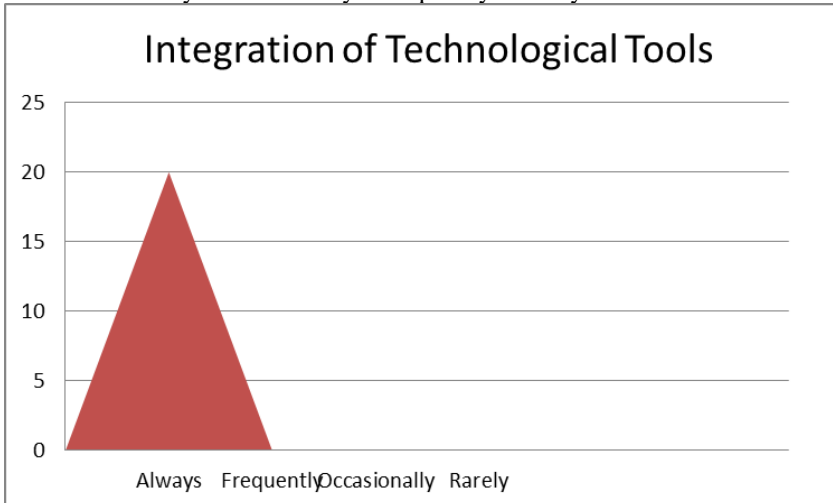
Preferences for certain strategies may vary based on grade level and subject matter, with Role-Playing being more popular among primary English teachers and Group Discussions among grade 9 teachers.

4. Survey Results

Integration of technological tools

How frequently do you integrate smart boards/TVs in your teaching practices?

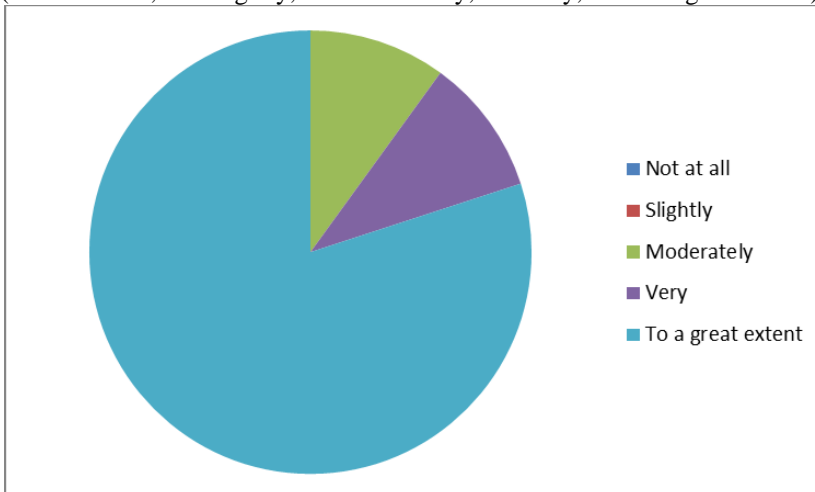
Select one: Rarely / Occasionally / Frequently / Always



High Consistency: All respondents (100%) reported using smart boards/TVs in their teaching practices regularly, with the highest frequency category being "Always."

In your opinion, to what extent has the integration of iPads and online platforms positively influenced the overall quality of teaching in your school?

(1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = To a great extent)



Qualitative insights shed light on successful practices and potential challenges.

Perceived Positive Influence:

"To a Great Extent" (Rating 5): All 16 teachers who selected this option, interestingly, belong to the age group of 24-30.

"Very" (Rating 4): Two teachers chose this option.

"Moderately" (Rating 3): Two teachers chose this option.

Age Correlation:

The fact that all 16 teachers who selected the highest rating (5) are within the age range of 24-30 suggests that younger teachers strongly perceive a significant positive influence from the integration of iPads and online platforms.

4.1 Discussion of findings

Effectiveness of English Language Teacher Training Programs

Research Question 1: How effective were English language teacher training programs in enhancing the skills and knowledge of educators?

Summary of Findings:

The majority of participating teachers rated the overall effectiveness of the English language teacher training programs as either "Very effective" or "Extremely effective." Notably, all teachers with 1-3 years of experience chose the highest rating. This suggests a positive correlation between program effectiveness and teachers in the early stages of their careers.

Implications:

The high ratings indicate a generally positive perception of the training programs. This may have significant implications for teacher preparedness and the quality of instruction. Novice teachers, in particular, seem to benefit significantly from these programs, possibly indicating a strong foundation for their teaching careers.

Impact of Pedagogical Strategies on Classroom Dynamics

Research Question 2: What was the impact of pedagogical strategies learned in these programs on classroom interactions and student engagement?

Analysis of Pedagogical Strategies:

Responses suggest a positive influence of pedagogical strategies on classroom dynamics. Both experienced and novice teachers reported enhancements in classroom interactions and student engagement. Specific examples, such as the effective use of management techniques and the incorporation of time as a strategy, highlight the practical application of learned strategies.

Comparative Analysis:

Experienced teachers tended to rate the impact slightly lower than their novice counterparts. However, a shared consensus on the positive influence of strategies emphasizes their overall effectiveness. The variations in specific strategies preferred by different groups indicate a need for personalized training approaches.

4.2 Integration of advanced technological tools

Research Question 3: How did the integration of smartboards, iPads, and online platforms influence the overall quality of teaching?

Frequency of Integration:

A noteworthy finding is the unanimous agreement among teachers on always integrating smart boards/TVs into their teaching practices. This high level of integration suggests a strong reliance on these tools, showcasing their significance in the teaching environment.

Age Group Analysis:

An intriguing phenomenon emerged concerning age groups, specifically in the integration of iPads and online platforms. Teachers aged 23-30 overwhelmingly rated the impact as "To a great extent," while older teachers showed more varied responses. This indicates a potential generational divide in perceiving the influence of technology on teaching quality.

5. Recommendations

Building on these findings, we recommend a continued emphasis on tailored training approaches, recognizing the differing needs of novice and experienced teachers. Additionally, acknowledging and addressing the potential generational gap in technology perception can guide future professional development strategies. While this study sheds light on various aspects of teacher training and instructional practices, there is room for further investigation. Future research could delve deeper into the specific elements of training programs contributing to their effectiveness and explore innovative strategies to bridge the gap in technological perceptions among different age groups.

6. Conclusions

Reflecting on our study journey, educators' commitment emerges as a driving force for excellence. Yet, challenges, especially in technological integration, reveal varied perceptions and comfort levels. Moving forward, we advocate a holistic approach, blending established practices with forward-thinking attitudes toward new developments. By harmonizing tradition and innovation, we create an adaptive educational environment. Excellence in teacher training, strategic pedagogical implementation, and thoughtful technology integration propel education forward. Our study not only captures today's educational landscape but also urges action—celebrating achievements, tackling challenges, and advancing continuous improvement. Education's essence lies in nurturing boundless learning passion, inspiring both educators and students toward excellence. Let's unite to forge ahead, not as an endpoint, but as a journey to shape a future-focused education system. This isn't just a conclusion but a call to embrace innovation, adapt to evolving needs, and foster skills for success in a changing world. Together, let's embark on a journey of ongoing enhancement, shaping tomorrow's education.

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Predictive ability of Composite leading indicators for business cycles of selected EU Countries

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Abstract

The last decades represent a turbulent period for the economies of many European countries. National and international institutions are trying to create reliable indicators that could reliably predict the development of their business cycle. At the international level, the Composite leading indicator (CLI) constructed by the OECD and the Economic sentiment indicator (ESI) constructed by Eurostat are currently used. The aim of the contribution was to analyze the predictive capabilities of these indicators with the help of cross-correlation analysis of the cyclical components of selected time series of the national GDP of the country and the relevant composite indicator of OECD and Eurostat. Four countries of the European Union, namely Italy, Spain, Germany and France, were analyzed for the period 2000-2024 and 2020-2024. In addition to the entire period, the time series were divided into shorter sections that were related to the economic crises occurring during this period. The presented analysis led to the conclusion that the given indicators have the ability to predict the business cycles of the selected countries, but the strength and accuracy of the prediction changes over time and depending on the country. The CLI of the OECD and the ESI of Eurostat can thus be used to predict business cycles as a supplement to the composite indicators created at the national level.

Keywords: Business cycle, CLI, Prediction, OECD, ESI, Cross-correlation analysis.

1. Introduction

The development of the economy, which occurs in the form of business cycles, has been a subject of interest for economists for decades. Although many economists believed that this topic was no longer relevant, the crises of 2008 and 2019 showed that the need for business cycle forecasts is well-founded and has real practical application. There is no consensus on the causes of business cycles, but there is debate about the optimal ways of measuring these phenomena (Tomic and Stjepanovic, 2018). Today, there are many methods available for tracking business cycles. The basic methods are based on the analysis of the cyclical component, which use various types of filters such as the Hodrick and Prescott filter (1997), the Baxter and King filter (1999) or the Christiano and Fitzgerald filter (2003). Another method of tracking business cycles is Markov Switching (MS), which is a typical nonlinear approach for modelling business cycle dynamics. However, this model is only suitable for univariate time series data analysis, so it can only describe the nonlinear characteristics of the business cycle and ignore the characteristics of coordinated changes in business cycles (Pu et al., 2023). A third option is the use of Dynamic Factor Models, which have been applied in the work of Camacho et al. (2018) or Berger and Wortmann (2022). Business cycles can also be monitored using VAR-based models, as confirmed by studies such as Ramajo et al. (2017). DSGE (Dynamic Stochastic General Equilibrium) models have been used, for example, by Christiano et al. (2014) and Bloom et al. (2018). Other models can be used to measure business cycles, such as the Probit model, the Smooth Transition Regression (STR) model, the Business Cycle Accounting (BCA) method (Pu et al., 2023). Another important option is the monitoring and prediction of business cycles using composite indicators, which is based on the common movements of the cyclical components of the main indicator and other variables. Economic fluctuations in a country can be transmitted through international commodity markets, financial markets and collaborative mechanisms (Lv et al., 2023). These indicators may exhibit positive or negative correlations, simultaneous, delayed or advanced development and volatility (Padilla & Quintero Otero, 2022). Exploring the issue of business cycles and composite indicators is crucial for developing warning mechanisms to estimate unpredictable economic forces related to cyclical fluctuations that affect multidimensional problems of the global and national economies. Composite leading indicators are increasingly used as a successful tool for political analysis and public communication. Today, many institutions are dedicated to creating composite indicators at both national and international levels. We encounter approaches where a custom composite indicator is prepared for each country, as is the case with the Composite Leading Indicator (CLI) by OECD, or indicators with the same composition are available for a selected group of countries, such as the Economic Sentiment indicator (ESI), which is created by Eurostat. The aim of this paper is to test the predictive capabilities of these two globally used leading indicators for a selected group of countries and to provide recommendations for their use in predicting business cycles

2. Literature review

Understanding the behavior of business cycles and their impact on fiscal and monetary policy is crucial for policymakers and actors in the economic and financial system. Both academic and professional communities have understood the need to study not only the development of business cycles, but also their common characteristics. The perspective of business cycle indicators is significant because they help policymakers predict macroeconomic developments, market expectations, etc. Predicting business cycles using composite indicators requires a deeper understanding of them. Therefore, the theoretical part of this paper focuses on defining the basic indicators that will be used in the analysis.

A significant leading indicator focused on predicting business cycles is the Composite Leading Indicator (CLI), which is constructed by OECD. The composite leading indicator is a time series, formed by aggregating a variety of component indicators which show a reasonably consistent relationship with a reference series (e.g. industrial production IIP up to March 2012 and since then the reference series is GDP) at turning points. The OECD CLI is designed to provide qualitative information on short-term economic movements, especially at the turning points, rather than quantitative measures. Therefore, the main message of CLI movements over time is the increase or decrease, rather than the amplitude of the changes. CLI contains useful information for predicting industrial production 4-8 months ahead. However, the accuracy of the forecasts for individual countries has decreased over time. It is important to note that CLIs offer information about the expected development of the economy, and thus a debate on the implementation of decisions in the public or private sector can be conducted (Monni et al. 2017; Fabuš, 2017). Garnitz et al. (2019) seek ways to increase the accuracy of forecasts, and adding indicators from the World Economic Survey of key trading partners leads, according to the authors, to an increase in the accuracy of forecasts in more than 50% of countries. Since January 2023, the OECD has reduced the number of countries monitored, and among the countries of the European Union, the CLI is only created for France, Spain, Germany and Italy.

Table 1. Components of CLI OECD for selected EU countries

| Components of CLI OECD | |
|---|--|
| France | Spain |
| Consumer survey - confidence indicator sa (% balance) | Manufacturing survey - rate of capacity utilization sa (% balance) |
| Manufacturing survey - Order books: level sa (% balance) | Construction survey - employment: future tendency sa (% balance) |
| Manufacturing survey - production: future tendency sa (% balance) | Consumer survey - confidence indicator sa (% balance) |
| Deflated orders for total manufactured goods (value) sa (OECD base year = 100) | CPI Services less housing (OECD base year = 100) |
| CPI All items (2010=10) <i>inverted</i> | <i>inverted</i> |
| Imports from Germany c.i.f. (USD) | Share prices: IGBM general index (OECD base year = 100) |
| | Passenger car registrations (OECD base year = 100) |
| Germany | Italy |
| Ifo business climate indicator (normal=100) | Consumer survey - confidence indicator sa (% balance) |
| Manufacturing survey - orders inflow/demand: tendency (% balance) | Manufacturing survey - Order books: level sa (% balance) |
| Manufacturing survey - export order books: expectation (% balance) | Manufacturing survey - production: future tendency sa (% balance) |
| Manufacturing survey - finished goods stocks: level (% balance) <i>inverted</i> | Deflated orders for total manufactured goods (value) sa (OECD base year = 100) |
| Services survey – demand evolution: future tendency (% balance) | CPI All items (2010=10) <i>inverted</i> |
| Consumer survey - confidence indicator sa (% balance) | Imports from Germany c.i.f. (USD) |
| Manufacturing survey - new orders (OECD base year = 100) | |
| Spread of interest rates (% p.a.) | |

Source: OECD, 2024

Eurostat uses confidence indicators, the Economic Climate tracer or its own Eurostat Business Cycle Clock application to monitor and predict the business cycle from the perspective of various input variables and compares them to identify the leading behavior of indicators. The importance of using confidence indicators for predicting business cycles was confirmed, especially during the period of the last financial crisis (Aarle et al., 2012). Eurostat constructs a composite indicator in the form of the Economic Sentiment indicator (ESI), which has been used to predict business cycles in EU countries since 1985. ESI belongs to the group of composite business activity indicators, which, based on simple questionnaire-based data collection, provides information with a time lag before calculating GDP. This approach is based on monitoring approximately 12,500 companies and 40,000 consumers surveyed, and these surveys have been conducted periodically at monthly intervals since 1961. The main advantage of these data is that they are available much earlier than the classic "hard data" coming from national accounts or output of the economy. For instance, while the European Commission releases business and consumer survey data at the end of the period, the estimate of the consumer confidence index is still about 10 days earlier. It is based on assessments and expectations of economic actors in five BCS sectors (industry, retail, services,

construction and consumer sector). Timeliness and high synchronous correlation with reference statistics are key advantages of ESI (Lipkind et al., 2019). ESI creates a composite indicator that has the same components for all countries with the following weights: confidence indicator in industry (40%), confidence indicator in the service (5%), consumer confidence indicator (30%), confidence indicator in construction (20%), confidence indicator in retail (5%). Existing studies confirm that ESI has predictive power in terms of GDP growth and many other economic variables (Sorić. 2013, Čižmešija and Škrinjarić 2021). However, studies have also identified mutual effects between sentiment and GDP growth (Demirel and Artan, 2017).

The main differences between CLI OECD and ESI can be summarized in three areas. The first area is the main focus of the indicators. CLI is more based on specific quantitative economic data, while ESI focuses on the psychology and mood of market participants. The second difference is that CLI is a predictive indicator that aims to predict future economic cycle developments, while ESI is a current indicator that reflects the current state and market expectations. This means that it is likely to show little or no prediction before the business cycle. The third fundamental difference is the methodology itself. CLI OECD is mainly constructed from quantitative data, with a clearly defined sequence of steps. ESI, on the other hand, is based on qualitative data and is based on averages of surveys and may be more sensitive to short-term changes in mood.

3. Aim and methodology

The aim of this paper is to assess the predictive capabilities of composite leading indicators from OECD and Eurostat in selected countries of the European Union. For a deeper analysis, countries such as France, Spain, Italy and Germany were chosen. The reason for the limited selection of countries is that since January 2023, OECD only provides CLI data for these four EU countries. The period analyzed was monthly data from 2000-2024 and 2020-2024. The reason for choosing these time periods is to highlight the fact that the quality of prediction may change over time and the predictive power varies depending on the period under review. Data were obtained from OECD and Eurostat databases, and they were seasonally adjusted and normalized. Table 2 presents the specific data type and source used in the analytical part of the paper.

Table 2. List of indicators

| Indicator | Source | Time period |
|--|----------|---------------------------------------|
| Gross Domestic Product (GDP), index, seasonally adjusted, normalized | OECD | Jan 2000- Feb 2024, Jan 2020-Feb 2024 |
| Composite Leading Indicator (CLI), index, seasonally adjusted, normalized | OECD | Jan 2000- Feb 2024, Jan 2020-Feb 2024 |
| Economic sentiment indicator (ESI), index, seasonally adjusted, normalized | Eurostat | Jan 2000- Feb 2024, Jan 2020-Feb 2024 |

Source: author.

To determine the predictive capabilities of CLI and ESI against GDP, cross-correlation over time was used using Pearson's correlation coefficient. To determine the exact size of the lead, cross-correlations were performed with time shifts of one to ten months backward. The predictive power of CLI and ESI indicators was assessed based on the scale presented in Table 3. This scale is not consistent with the commonly used interpretation of Pearson's correlation coefficient, as mentioned by Kuckartz (2013).

Table 3. Scale for assessing the strength of business cycle prediction

| Period in which the highest value of cross-correlation is recorded | Cross-correlation value (t) | Strength of prediction |
|--|-----------------------------|---|
| t | (0-1) | No predictive power (indicator does not anticipate GDP development) |
| from t-1 to t-10 | $0 < 0,50$ | No predictive power |
| from t-1 to t-10 | $0,50 < 0,65$ | Weak predictive power |
| from t-1 to t-10 | $0,56 < 0,75$ | Moderately strong predictive power |
| from t-1 to t-10 | $0,75 < 1$ | Strong predictive power |

Source: author.

In addition to the size of the lead, the qualitative assessment of prediction is also the number of months by which the indicator can predict GDP development. The indicator that achieves the same value of cross-correlation over a longer period of time is of better quality. This approach to determining predictive capabilities was applied for the relationship between GDP and CLI OECD and GDP and ESI Eurostat.

3. Results

3.1 Business Cycle Development of Selected Countries

The selected EU countries such as France, Germany, Italy and Spain have been influenced by similar economic shocks in the past, primarily due to their membership in the economic and monetary union. Similarly, their business cycles have been significantly affected by international shocks such as the financial crisis since 2007 and the COVID-19 pandemic since 2019. Figure 1 shows GDP development for the period 2000-2024.

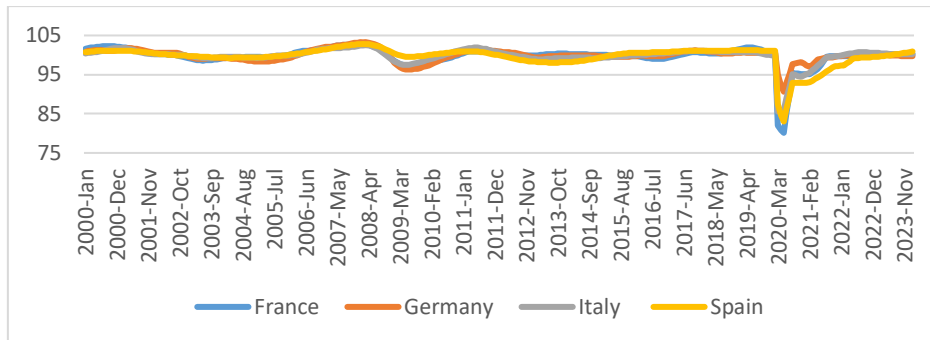


Figure 1. Development of the cyclical component of GDP (index, normalized)

Source: author, based on OECD data.

Figure 1 highlights the strong negative impacts of these crises on the selected group of countries, which at first glance seem to have developed in the same direction. In terms of the monitored indicator, the decline was more pronounced in connection with the COVID-19 pandemic, which can be attributed to its sudden and unexpected onset. During the financial crisis of 2008, the most pronounced decline in the economy was recorded in Germany, while in 2019, Germany experienced the smallest decline in GDP among the countries monitored. The COVID-19 pandemic was the time of the greatest GDP decline in France and Spain. Figure 1 points to a very similar development of business cycles, which could suggest that the same type of indicator could be used to predict these cycles. However, these conclusions need to be thoroughly investigated.

3.2 Testing the Predictive Capabilities of Selected Indicators against the Business Cycle in the Period 2000-2024

Based on the chosen methodology, we tracked the predictive capabilities of CLI and ESI in relation to GDP. The first step was to track the entire period from 2000-2024. Table 4 shows the results of cross-correlations with shifts of ten months backward.

Table 4. Results of cross-correlation for the period M1 2000 - M2 2024

| 2000-2024 | France | | Germany | | Italy | | Spain | |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------|
| | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP |
| t-10 | 0.353 | 0.233 | 0.615 | 0.484 | 0.432 | 0.349 | 0.430 | 0.200 |
| t-9 | 0.369 | 0.262 | 0.639 | 0.516 | 0.462 | 0.378 | 0.451 | 0.208 |
| t-8 | 0.382 | 0.282 | 0.646 | 0.530 | 0.485 | 0.398 | 0.466 | 0.215 |
| t-7 | 0.392 | 0.298 | 0.642 | 0.532 | 0.499 | 0.416 | 0.478 | 0.222 |
| t-6 | 0.398 | 0.309 | 0.635 | 0.525 | 0.503 | 0.424 | 0.485 | 0.228 |
| t-5 | 0.400 | 0.312 | 0.621 | 0.513 | 0.498 | 0.422 | 0.487 | 0.222 |
| t-4 | 0.414 | 0.316 | 0.607 | 0.501 | 0.503 | 0.425 | 0.491 | 0.212 |
| t-3 | 0.470 | 0.342 | 0.606 | 0.502 | 0.530 | 0.428 | 0.504 | 0.218 |
| t-2 | 0.546 | 0.390 | 0.609 | 0.511 | 0.571 | 0.452 | 0.522 | 0.237 |
| t-1 | 0.606 | 0.456 | 0.592 | 0.513 | 0.598 | 0.482 | 0.529 | 0.258 |
| t | 0.614 | 0.500 | 0.520 | 0.479 | 0.596 | 0.502 | 0.509 | 0.261 |

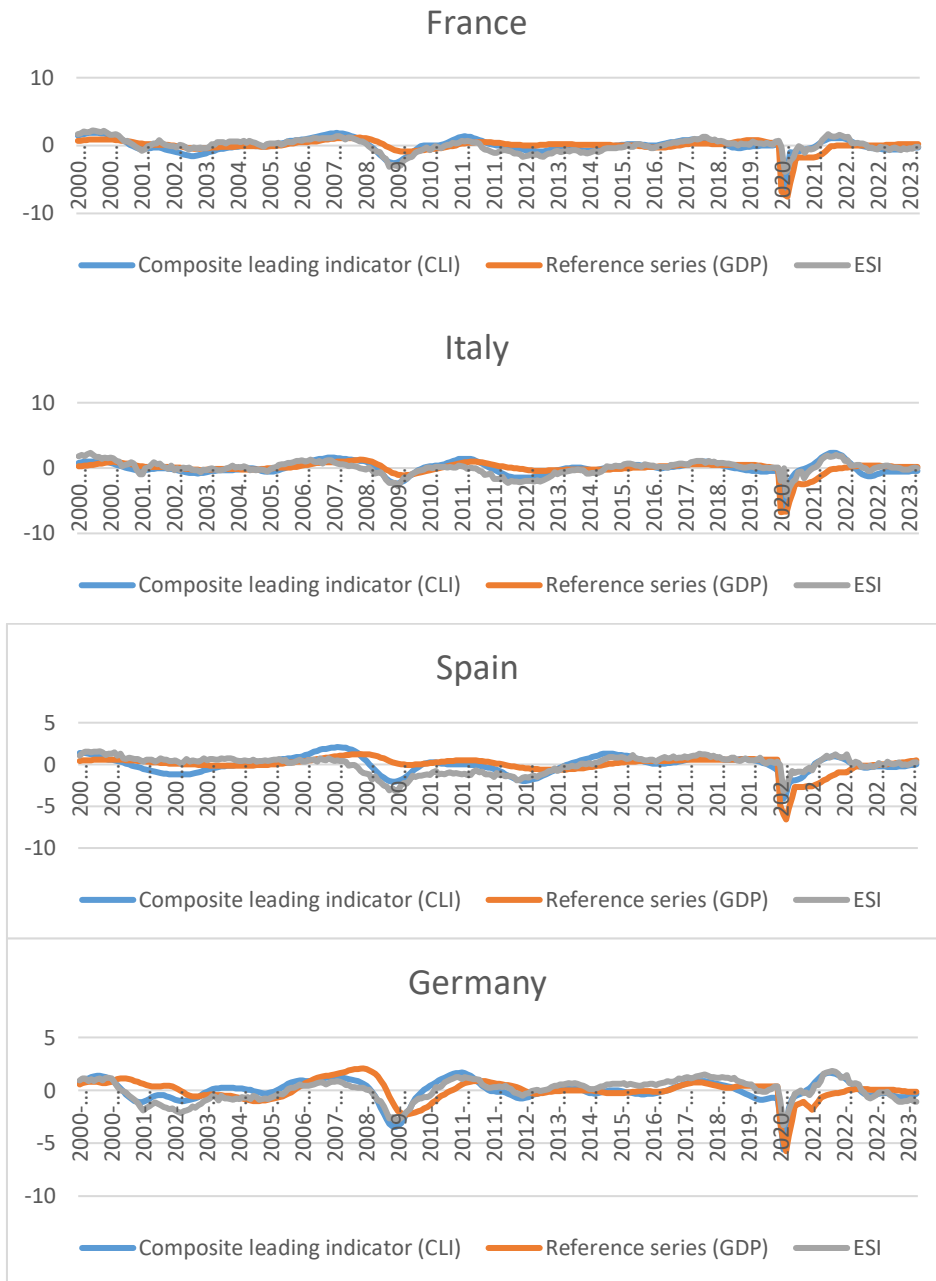
Source: own calculations.

Table 3 shows that in the period monitored, CLI and ESI exhibited a sufficient value of the correlation coefficient above 0.50 in all cases except ESI/GDP. This means that these indicators have a cyclical character. In our case, the values of cross-correlation above 0.50 also appeared in time t, which means that the indicator develops simultaneously with GDP development. This situation occurred for ESI/GDP France and ESI/GDP Italy. In this case, ESI only replicates GDP development in these countries and did not demonstrate predictive power in the period monitored. On the contrary, ESI predicted GDP development in Germany, where the highest value of cross-correlation was 0.532 at time t-7. According to

our assessment scale, this is a weak predictive capability. CLI OECD showed predictive power for all monitored countries, and the number of months of prediction ranged from one (France, Italy, Spain) to eight months in the case of Germany.

Figure 2 illustrates the development of GDP and the leading indicators CLI OECD and ESI Eurostat for all countries monitored.

Figure 2. Development of the cyclical component of GDP, CLI OECD and ESI for the period 2000-2024 (index, normalized)



Source: authors, based on OECD data.

Figure 2 shows periods where leading indicators were actually able to anticipate GDP development. This is evident mainly in the case of Germany during the period before the crisis of 2008. For other countries, the prediction time was only one to three months.

3.3 Testing the Predictive Capabilities of Selected Indicators against the Business Cycle in the Period 2020-2024

In the case of testing prediction, the length of time series can affect the overall value of cross-correlation. This is because false signals from the past directly influence the strength and quality of the prediction. For this reason, we decided to

explore the predictive capabilities of CLI and ESI in a shorter time period of 2020-2024. The results of cross-correlations are presented in Table 5.

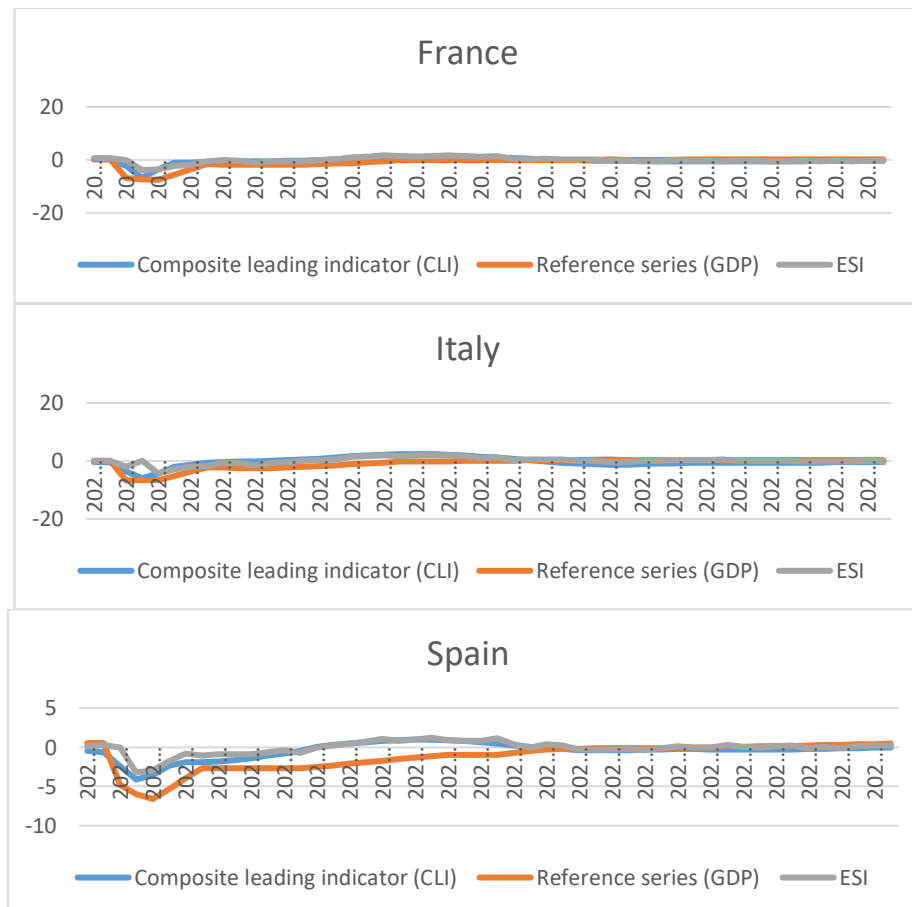
Table 5. Results of cross-correlation for the period M1 2020 - M2 2024

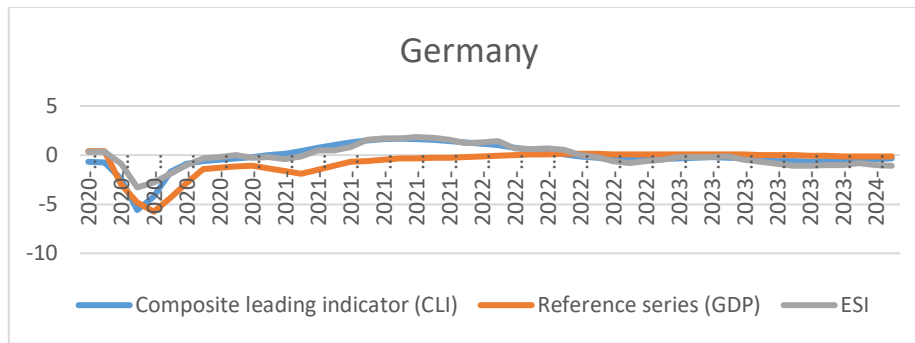
| 2020-2024 | France | | Germany | | Italy | | Spain | |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP |
| t-10 | 0.605 | 0.507 | 0.859 | 0.718 | 0.649 | 0.641 | 0.728 | 0.583 |
| t-9 | 0.601 | 0.521 | 0.829 | 0.733 | 0.643 | 0.674 | 0.724 | 0.584 |
| t-8 | 0.587 | 0.529 | 0.720 | 0.660 | 0.633 | 0.705 | 0.711 | 0.575 |
| t-7 | 0.572 | 0.529 | 0.610 | 0.550 | 0.610 | 0.725 | 0.693 | 0.564 |
| t-6 | 0.461 | 0.416 | 0.499 | 0.389 | 0.530 | 0.671 | 0.634 | 0.518 |
| t-5 | 0.319 | 0.268 | 0.408 | 0.251 | 0.425 | 0.565 | 0.551 | 0.429 |
| t-4 | 0.257 | 0.163 | 0.373 | 0.183 | 0.369 | 0.491 | 0.494 | 0.342 |
| t-3 | 0.509 | 0.315 | 0.609 | 0.380 | 0.463 | 0.495 | 0.612 | 0.435 |
| t-2 | 0.507 | 0.310 | 0.604 | 0.371 | 0.460 | 0.492 | 0.611 | 0.435 |
| t-1 | 0.685 | 0.523 | 0.703 | 0.519 | 0.535 | 0.603 | 0.695 | 0.577 |
| t | 0.748 | 0.683 | 0.648 | 0.546 | 0.566 | 0.716 | 0.700 | 0.655 |

Source: own calculation.

Table 5 clearly shows that choosing a shorter time period had an impact on the results of cross-correlations. In the case of France, CLI OECD and ESI acted as simultaneous indicators and were unable to predict GDP development even for a single month. In the case of Germany, the prediction was nine (CLI) and eight (ESI) months. The strength of the prediction improved significantly from weak to strong. In the case of Italy, the indicators also acted as leading indicators. ESI reached a strong level of prediction of seven months ahead, and GDP reached a moderately strong level of prediction for ten months ahead. Spain showed moderately strong prediction for ten months ahead for CLI, but no prediction for ESI. The visual representation of these predictive capabilities of CLI OECD and ESI can be seen for each country in Figure 3.

Figure 3. Development of the cyclical component of GDP, CLI OECD and ESI for the period 2020-2024 (index, normalized)





Source: author, based on OECD data.

3.4 Comparing Predictive Capabilities of Indicators over Time

Preliminary results of cross-correlations suggest that the period monitored has a significant impact on demonstrating the predictive capabilities of the selected indicators. Table 6 summarizes the results obtained.

Table 6. Comparison of cross-correlation results in the periods monitored

| Country | 2000-2024 | | 2020-2024 | |
|---------|-------------|-------------|--------------|-------------|
| | CLI/GDP | ESI/GDP | CLI/GDP | ESI/GDP |
| France | t-1 (0,606) | t (0,500) | t (0,748) | t (0,683) |
| Germany | t-8 (0,646) | t-7 (0,532) | t-10 (0,859) | t-9 (0,733) |
| Italy | t-1 (0,598) | t (0,502) | t-10 (0,649) | t-7 (0,725) |
| Spain | t-1 (0,529) | t (0,261) | t-10 (0,728) | t (0,655) |

Table 6 shows the time when the maximum value of the correlation coefficient was achieved in the monitored period. The best predictive capabilities are shown by CLI OECD and ESI in the case of Germany, which means that the components of these indicators are well-chosen and allow the state or business sector to provide timely signals about the development of the German business cycle. An improvement in the predictive capabilities of all indicators was observed when analyzing the data for 2020-2024, confirming the initial assumption of our research. In the case of France, it is necessary to change the composition of CLI OECD, because currently, this indicator, along with ESI, can only be used to monitor GDP development in France, not to predict it. In the case of Italy, ESI and CLI demonstrated their ability to predict GDP development in Italy, but only during the period 2020-2024.

4. Conclusions

Predicting business cycles remains a very important area of research. With its help, governments, as well as businesses, can react in advance to upcoming positive, but especially negative economic changes, gaining enough time to prepare necessary measures. This paper focused on testing the predictive capabilities of currently known and used indicators CLI OECD and ESI Eurostat. The most important findings of the article is, that Composite leading indicators (CLI and ESI) have predictive power for business cycles. The research found that both the OECD's CLI and Eurostat's ESI can predict the business cycles of selected EU countries, though their predictive power varies across countries and over time. Second finding is, that predictive power varies across countries and time periods. The study showed that the CLI and ESI are not equally effective predictors for all countries, and their accuracy can be influenced by factors like the specific economic conditions and the presence of economic shocks. The article highlights the importance of selecting indicators and applying appropriate methods for analyzing business cycles. It emphasizes that the choice of indicators can influence the effectiveness of the prediction and the quality of the results. Last finding is, that CLI generally performs better than ESI. The research indicates that CLI OECD, which is country-specific, generally exhibits stronger predictive capabilities compared to the more standardized ESI. This suggests that tailoring the indicator to the specific characteristics of a country's economy could improve prediction accuracy. We can also define limitation of this contribution. The research focused on only four EU countries (France, Spain, Italy, and Germany) and the two leading indicators (CLI OECD and ESI). This limits the generalizability of the findings to other countries and indicators. The study analyzed data from 2000-2024 and 2020-2024. A longer time period could have provided more robust findings and insights. The research used only cross-correlation analysis to assess the predictive capabilities of the indicators. A more sophisticated approach, like time-series modeling or machine learning techniques, could offer more nuanced results. The research relied solely on quantitative data from the indicators and GDP. Integrating qualitative data, such as expert opinions or consumer sentiment surveys, could provide a more complete picture of the economic landscape. The research did not consider other potential factors that could influence business cycles, such as political events, technological advancements, or global economic trends. These factors could affect the accuracy of the predictions.

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Gender gap in academic entrepreneurship: a European mapping

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Abstract

Academic entrepreneurship serves as a powerful bridge between business and science driving economic growth and fostering innovation. Despite it seems to be an increasingly relevant dimension of academic life, academic entrepreneurship is underexplored, especially from a gender perspective. The present study aims to capture the geographical distribution of Proof of Concept (PoC) fundings from the European Research Council (ERC) that support the translation of research results into innovation. Considering data in the period 2019-2023, findings reveal that a gender gap exists in the distribution of fundings awarded by male and female principal investigators. The proposed geographical mapping is a suitable tool to promote knowledge sharing and brokerage on the need for a structural change intended to promote more heterogeneous, dynamic and gender-balanced academic environments.

Keywords: gender gap, gender equality, academic entrepreneurship, knowledge sharing, European Research Council (ERC).

1. Introduction

The evidence of recent years demonstrates the benefits that derive from the greater presence and valorisation of women in economy and society (Stevens, 2010; Kabeer, 2012; Bradshaw, Castellino and Diop, 2013; Agrawal, 2017; Peterson and Powers, 2019). But, the gap between male and female gender (so-called Gender gap) brings attention to the unequal condition in which women live. According to the World Economic Forum's Global Gender Gap Index 2024, which compares gender equality in 146 economies, the global gender gap has been closed by 68.4% in 2023 and 68.5% in 2024. Best practices are localized in North Europe (Pal, Piaget and Zahidi, 2024). To tackle gender inequality in a socially responsible and inclusive way, also in the light of the above-mentioned non-positive data, countries and international organizations are adopting various political and strategic measures. First of all, the 2030 Agenda for Sustainable Development approved by the United Nations Organization (UN), consisting of goals in the environmental, economic, social and institutional fields by the year 2030 (United Nations, 2015). It places the achievement of gender equality among the sustainable development goals; specifically, Goal 5 aims to achieve gender equality and the empowerment of all women and girls, as fundamental human rights for a prosperous and sustainable world. The gender gap represents a crucial theme for today's era, but it is not a historicized concept, because it is a new field of investigation for which it is not yet possible to identify a central line of study (Rubin, 1975; Scott, 1988; Nicholson, 1990; Romano and Petruccioli, 2020; Tripodina, 2021). Human capital is generally the carrier of multiple specificities, which cannot be homologated and homogenised but must be preserved and exploited to the point of becoming strategic: these variations include gender differences, age, culture, etc.; specifically in gender diversity management, it aims to build a framework where men and women have equal opportunities, treatment and conditions (Johnston and Packer, 1987; Kreitner and Kinicki, 2004, 2008). Gender theory denies any gender role stereotype in favour of achieving equality in terms of rights and opportunities in education, employment, and health (Stumbitz, Lewis and Rouse, 2018). Based on the above, this work aims to contribute to studies on the gender gap in one of the areas where it is most evident, such as academia, innovation and academic entrepreneurship (Abreu and Grinevich, 2017; Ghosh, 2024). In particular, the gender gap was analysed, focusing on European academic environments, because knowledge has become a fundamental factor in the production and development of today's society (Andersson et al., 2021). In other words, the economic and social development of a country is strongly correlated with its ability to produce, disseminate and apply knowledge. In a knowledge-based society like today's society, universities are asked to play a decisive role from the social and economic point of view. Universities can no longer limit themselves to preserving and transmitting knowledge, but must also know how to generate and implement it (Owen-Smith and Powell, 2001; Agrawal and Henderson, 2002; Murray, 2002; Siegel et al., 2003, 2007).

The European Research Council (ERC) is the body of the European Union that encourages this mission of pushing the knowledge frontiers, so that research, innovation and academic entrepreneurship are feasible. In particular, the ERC funds excellent researchers who intend to carry out research activities in the Member States of the European Union and associated countries. Among the various funding schemes, the PoC is the main focus of this research, because it supports academic entrepreneurship and aims to ensure that research results are put on the market and, therefore, commercialized. The PoC is, therefore, a funding which does not aim to extend research (like the other funding schemes) but covers the initial stages of transforming research results into a commercial or social value proposal. It is interesting to observe the distribution of

these funds in the last five years (from 2019 to 2023) from the point of view of the gender of researchers (so-called Principal Investigators - PIs). In general, the gender distribution of fundings is reversing with the years of experience of researchers. Of these, 3608 are men and 1763 women (only 32.76%). At lower levels of research, the number of female researchers is higher, while the number of female researchers among the leaders of research is low. This trend is in line with current evidence that the female presence decreases as a career progression. The analysis of the ERC database, which gives details and scope of the research project, also showed that female researchers tend not to be in favor of science, where most funding is allocated.

| Researchers | Starting Grant | Consolidator Grant | Advanced Grant | PoC |
|--------------------|-----------------------|---------------------------|-----------------------|------------|
| Male PIs | 35,10 % | 27,02 % | 17,58 % | 19,56 % |
| Female PIs | 45,98% | 28,62 % | 11, 76 % | 13,35 % |

Table 1. Gender distribution of ERC fundings for the period 2019-2023.

According to this, the presented work aims to study the geographical distribution of PoC fundings granted by the European Research Council (ERC) to reveal whether there is a gender gap in academic environments with particular reference to academic entrepreneurship.

The paper is structured as follows: the next Section explains the methodology used for the research; in Section 3 the results are presented and, finally, Section 4 discusses results and concludes the paper.

2. Research process and method

The study was conducted using the geo-referenced mapping tool, that shows its potential in social science investigations not only to provide data and their visualizations, but also to propose and enable the construction of interpretative models and solutions (McMaster and Harvey, 2010). Georeferencing means the attribution of information to a data item relating to its geographical location. Georeferencing is used in Geographic Information Systems (GIS). The GIS is a computer-based information system which enables the acquisition, recording, analysis, display, return, sharing and presentation of information. It is therefore an information system capable of associating data with their geographical position on the earth's surface and processing them to extract information from them. This tool has made it possible to map the distribution of ERC grants geographically in space, with the aim of comparing the phenomenon of gender equality among researchers.

The analysis was based on the ERC dataset for the period from 2019 to 2023. Attention was focused on the financing scheme of the PoC, because it is the funding scheme that supports the entrepreneurial phase of research, the commercial and social value proposition in the final phase of research. There were 26 nations (that is, the nations of the European Union, Israel and Switzerland), 331 universities and research institutes. However, the database contains mostly data relating to details of research projects. An extension was therefore necessary, which consisted in the addition of new data collected on the gender of PIs. This integration was made downstream of a manual search by means of Google search engine. In the period under review, the PoC funding scheme financed a total of 947 projects, of which only 236 were led by female researchers (24.92%).

Two main instruments were used for the above purposes. The first tool used was the Microsoft Excel software, which proved to be useful and convenient for the expansion of the initial database. In particular, it has allowed the percentage of funding distribution between genres to be calculated. The second tool used was the open source QGIS software, which made it possible to analyze and edit spatial data and generate a map. The data from the database processed in Excel has been merged into the opensource software named QGIS. From these, images were created, which are maps of the distribution of PoC funding by researcher, gender and country. These maps have been customized in color and enriched with numerical labels. In general, the non-eligible nations for ERC resources have been colored gray and do not have numerical labels; instead, the eligible nations for ERC resources have been colored green, blue, or pink and have numerical labels. Furthermore, the higher the number of projects observed per country (in absolute or percentage terms), the darker the color gradation used.

3. Results

This section presents the data and results of mapping. Specifically, Figure 1 is a map summarizing the number of projects per country funded by the PoC funding scheme. The gender of researchers has not been taken into account. More projects are observed in Germany, Spain and the Netherlands. Italy, France and the UK follow.

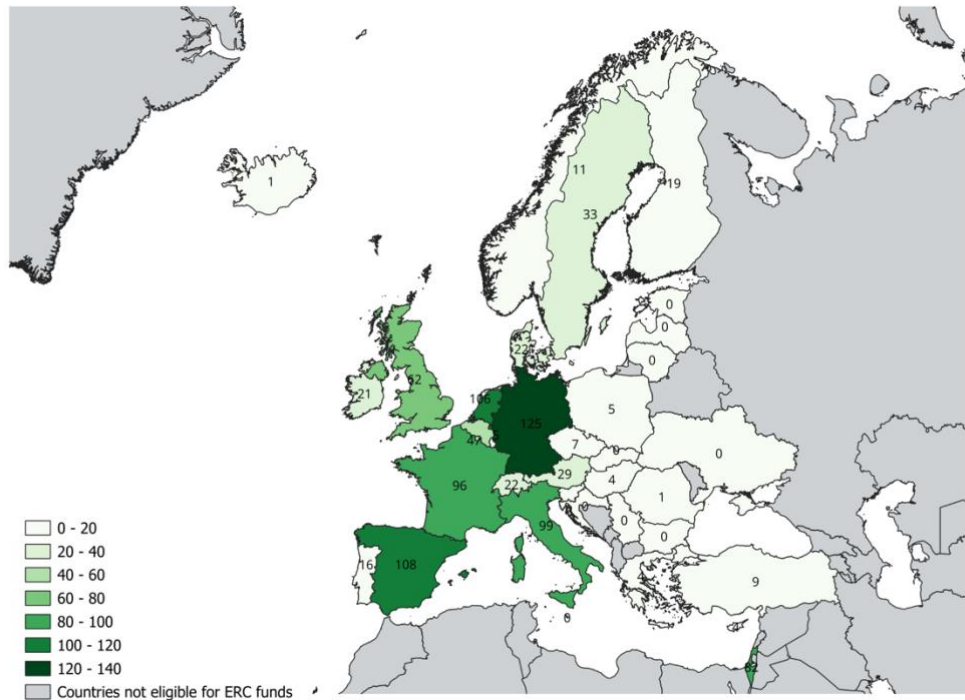


Figure 1. Number of projects per country funded by the PoC funding scheme.

Figure 2 is a map showing the number of projects funded by the PoC scheme, which is run by a male researcher. Based on the above map, it can be seen that: in Germany 99 projects out of a total of 125 are led by men; in Spain 81 out of 108; in the Netherlands 79 out of 106. Still: in Italy 67 out of 99; in France 80 out of 96; in the UK 45 out of 62.

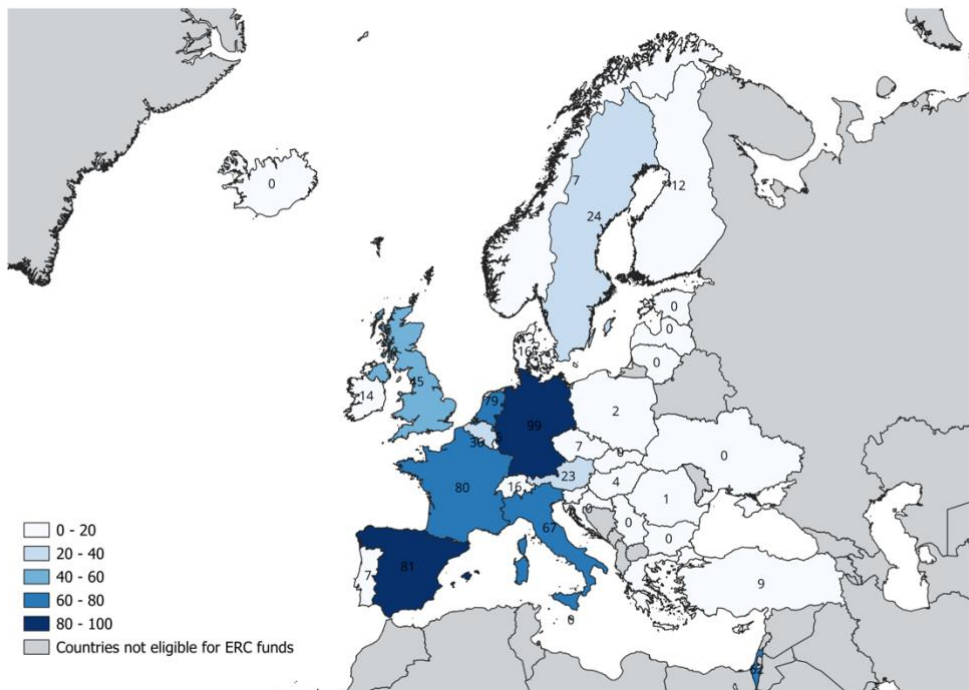


Figure 2. Number of projects funded by the PoC scheme, which is run by a male researcher.

Similarly, Figure 3 is a map representing a breakdown of the number of projects funded by the PoC funding scheme, which is led by a female researcher. The situation is worrying. Based on the above map, it can be seen that: in Germany, 26 projects out of a total of 125 are led by women; in Spain 27 out of 108; in the Netherlands 27 out of 106. Still: in Italy 32 out of 99; in France 16 out of 96; in the UK 17 out of 62.

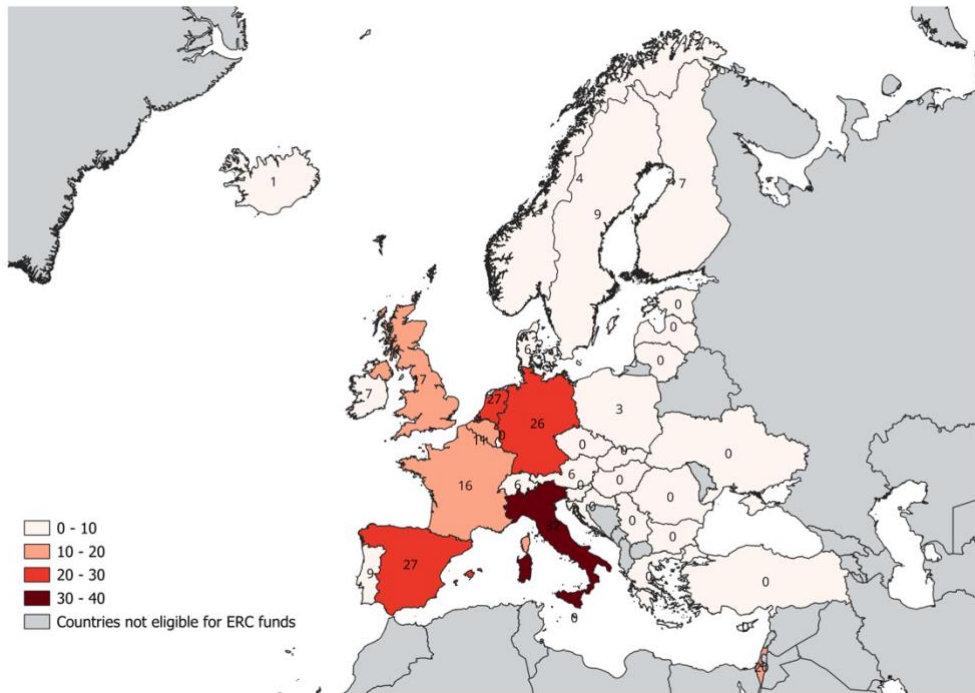


Figure 3. Number of projects funded by the PoC funding scheme, which is led by a female researcher.

The numbers shown in Figures 1, 2 and 3 have also been translated into percentages, so that data can be interpreted more intuitively. So, Figure 4 is a map of the percentage of male researchers per nation who led projects funded by the PoC funding scheme.

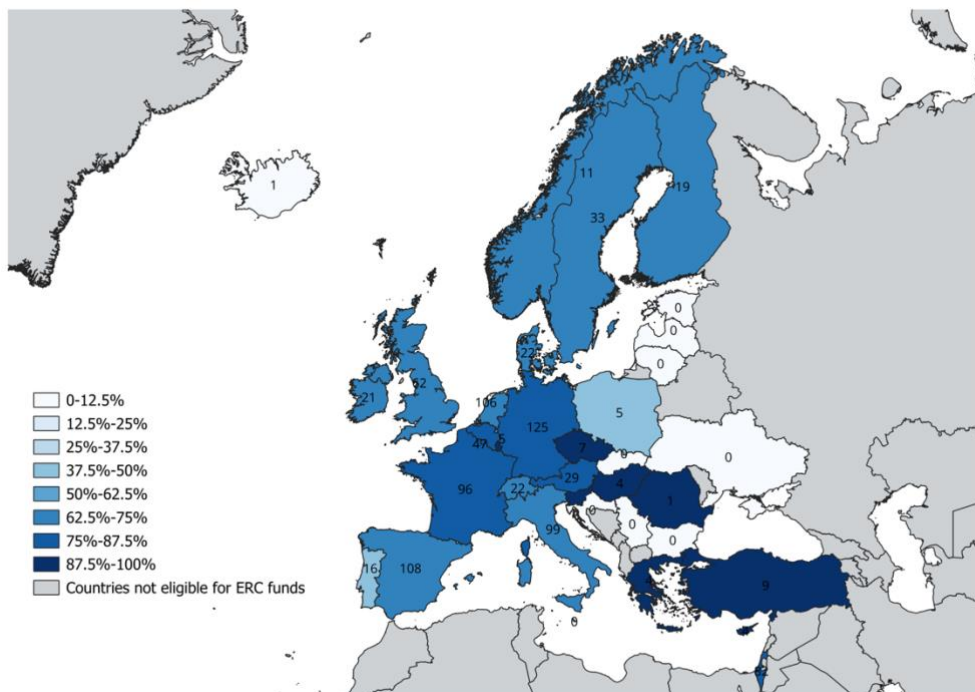


Figure 4. Percentage of male researchers per nation who led projects funded by the PoC funding scheme.

Similarly, Figure 5 is a map of the percentage of women researchers by country who led projects funded under the PoC funding scheme.

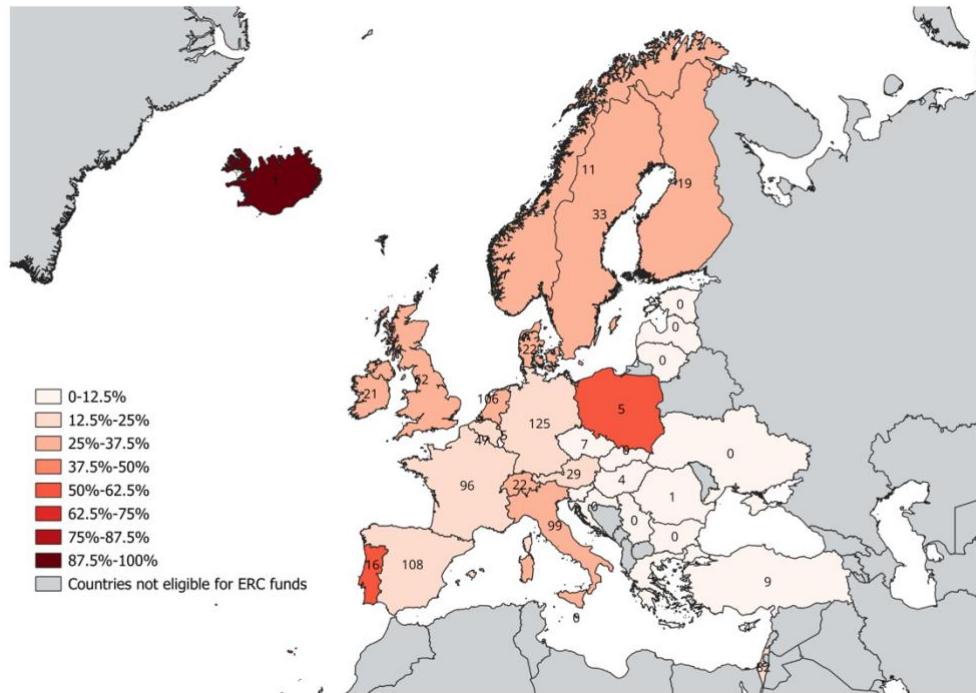


Figure 5. Percentage of women researchers by country who led projects funded under the PoC funding scheme.

In summary, a gender gap has emerged in the distribution of funding between researchers. For a better understanding, it may be useful to have a graphical representation of synthesis (Figure 6).

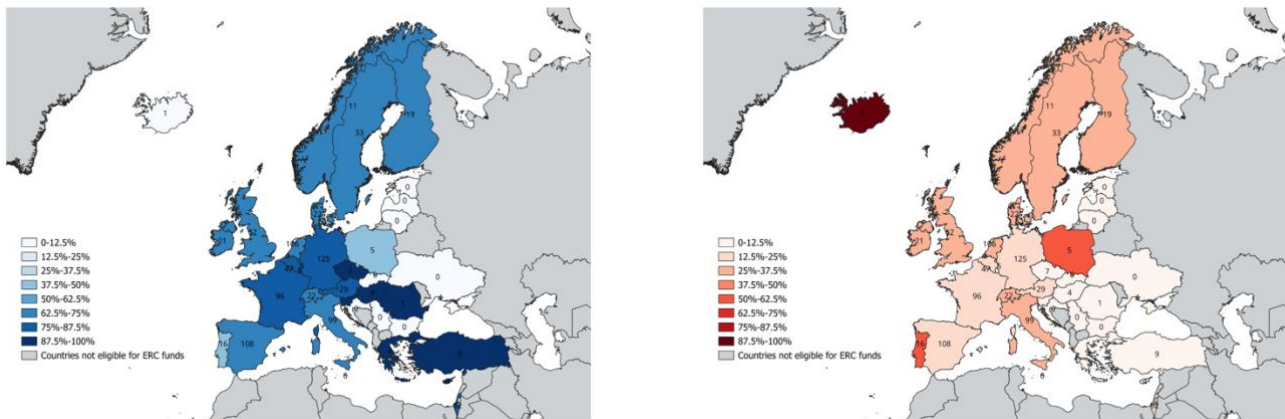


Figure 6. Percentage comparison between genders.

Leaving out the countries where no PoC projects have been awarded, in the countries with a smaller number of projects there are no significant differences between the sexes. For example, Scandinavian countries, Portugal, Ireland. The countries with the highest number of funded projects, namely Germany, France and the Netherlands, are worth noting. Here the most significant disparity is found: in Germany, only 20.8% of all projects funded by PoC are led by women researchers; in Spain 25%; in the Netherlands 25.4%; in Italy 32.3%; in the UK 27.4% and in France even 16.6%.

This means that women are still under-represented in higher level academic circles and less female-led academic entrepreneurship. Considering the nature of the project ideas funded, this is a scheme to fund research projects in scientific-technological disciplines and fields of study generally male-dominated.

4. Discussion and conclusions

This work is placed in the broader context of gender discrimination studies and focuses on the issue of gender equality, with particular reference to the academic context of research, innovation and academic entrepreneurship. The work has focused on gender discrimination in European university settings. The analysis focused on the distribution of PoC funding for female researchers in 2019-2023. The ERC database and its extension to tools like Excel and QGIS software have allowed for creating graphical representations of the data and maps, which have made it possible to explore possible spatial relationships and interpretations of reality. The use of mapping has been useful for an immediate interpretation of data and results, facilitating the understanding of a phenomenon - such as gender equality - It is of fundamental importance that geospatial assessments can help to bridge the gap, implement a cultural change and identify viable solutions (World Bank, 2024).

Finally, less than 30% of researchers worldwide are women. In the higher funding schemes, a predominance of male researchers is claimed (as in the case of Italy, UK, Netherlands, Spain, Germany and France), whose exploration of causes (for example research categories, social, cultural or psychological barriers) can be a potential future development of the research.

The causes of this and, therefore, the enabling factors for access to funding could be a potential development of future research.

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A Literature Review on the Cultural Challenges in the Development of Women's Entrepreneurship

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Abstract

This paper presents a literature review on the cultural challenges influencing the development of women's entrepreneurship. Through a comprehensive analysis of literature and international practices, the study highlights that traditional gender norms and social discrimination are among the primary barriers faced by women entrepreneurs. These challenges range from structural limitations in developing economies to underrepresentation in innovative sectors in developed countries. The review provides a detailed examination of how these obstacles affect the performance of women entrepreneurs and emphasizes the importance of inclusive solutions such as mentoring, the creation of support networks, and empowerment through education and training. Furthermore, the paper offers a comparison between developed and developing countries to understand the diverse nature of cultural barriers and their impact on the growth of women's entrepreneurship. The findings underscore the necessity of addressing cultural challenges to foster a supportive environment that promotes gender equality and economic development.

Keywords: cultural challenges, social discrimination, traditional gender norms.

1. Introduction

The cultural challenges that impact female entrepreneurship are a complex interplay of social, psychological, and economic factors, which often hinder women from reaching their full potential as entrepreneurs. Unlike formal barriers, cultural challenges are often harder to identify and resolve, as they are deeply rooted in societal norms and expectations related to gender roles and women's place in society. On a global scale, one of the greatest obstacles for female entrepreneurs is the gender stereotype that perceives them as less capable of managing and developing businesses compared to men (Aldrich & Ruef, 2020).

In many cultures, women are considered more suited for traditional roles, such as that of mother and family caretaker, which often results in the neglect of opportunities for professional and entrepreneurial development. This phenomenon is not only present in developing countries but also in more developed economies, as evidenced by the challenges faced by women operating in the most innovative and high-tech sectors (Kelley et al., 2021). However, recent studies suggest that cultural challenges impacting female entrepreneurship are not uniform and are contingent on the cultural context and level of development within each country.

One of the most significant aspects of cultural challenges is the influence of traditional gender norms, which often create the greatest barriers for female entrepreneurs. These norms can relate to a wide range of issues, including the expectation to balance professional and family commitments. For example, a recent study revealed that women in many societies continue to face expectations to manage multiple responsibilities both inside and outside the home, which limits their opportunities to develop successful businesses (Carter et al., 2021). In many cases, these cultural expectations prevent women from seeking funding or engaging in professional support networks that are essential for business growth.

Furthermore, in countries such as Japan, South Korea, and China, cultural norms linking a woman's role to the family and the maintenance of social harmony often lead to women withdrawing from professional and entrepreneurial opportunities. Women in these countries often face a strong dilemma between professional aspirations and pressure to meet traditional family expectations (Yamamura & Sato, 2021). This challenge is further exacerbated when mentoring and training opportunities for women are limited or inaccessible.

In the context of developed countries, despite significant progress towards gender equality, women still face substantial obstacles. These include low representation of women in innovative and technology sectors, as well as limited access to capital to support the creation of new businesses (Brush et al., 2021). Recent research has shown that in technology and innovation sectors, where high levels of expertise and creativity are required, women often find themselves excluded—not due to their abilities, but because of ingrained beliefs about the capabilities and roles of women in these fields (Aldrich et al., 2020). Once again, these limitations stem from gender stereotypes that have persisted for centuries and are embedded within professional and societal cultures.

In several European countries, such as Germany and Switzerland, efforts are being made to address these barriers through policies aimed at promoting gender equality. However, cultural challenges remain deeply entrenched. Female entrepreneurs in these countries often encounter a professional environment that favors men, and although institutional support and funding opportunities exist, they are often limited and fail to change the cultural practices that keep women from accessing equal opportunities (Siegrist et al., 2020).

Another important aspect of cultural challenges is the lack of equal opportunities for women in professional training and modern technology. Women engaged in entrepreneurship often have limited access to professional development opportunities, training, and resources necessary to prepare them for sustainable business development. This is particularly true in underdeveloped or less developed regions, where investments in education and professional training for women are limited. According to a recent study by Banerjee and Duflo (2021), the lack of institutional support for training and mentoring is one of the greatest barriers faced by female entrepreneurs in developing countries.

Globally, women face the need to acquire new skills and gain an edge in the labor market, equipping themselves with knowledge of technology and emerging trends essential for survival in an increasingly innovation- and digitalization-driven economy (Kelley et al., 2021).

The aim of this paper is to analyze the cultural challenges impacting the development of female entrepreneurship by identifying key factors arising from traditional social norms and gender role expectations, as well as their negative impact on women's opportunities to develop successful businesses. This research examines the impact of these cultural challenges at both global and regional levels, identifying the main barriers associated with gender stereotypes and social prejudices that limit women's opportunities to engage in entrepreneurial activities.

The structure of the paper is organized as follows: The first section provides an overview of the cultural challenges and their direct impact on female entrepreneurship. It highlights the barriers associated with traditional social norms, gender roles, and societal perceptions that limit women's opportunities to take the initiative in business. The second section examines the cultural factors hindering women in innovative sectors and in economic environments that require continuous development. This section emphasizes the influence of gender stereotypes and social pressures that negatively affect women's chances of achieving success in entrepreneurship. The third section summarizes the findings and offers recommendations to address and overcome these cultural barriers. This research suggests that an inclusive approach and interventions at both societal and institutional levels can help create equal opportunities for female entrepreneurs, alleviating cultural challenges and promoting more opportunities for equitable development.

The research question of this paper is: What are the key cultural challenges affecting the development of female entrepreneurship, and which supportive strategies are most effective in overcoming these challenges in varying socio-economic contexts?

To address this research question, the primary objectives of this paper are as follows:

1. To identify the main cultural challenges, including traditional gender norms and societal stereotypes, that influence the development of female entrepreneurship at global, regional, and local levels.
2. To propose comprehensive strategies, such as the establishment of support networks, mentoring programmes, and gender equality policies, aimed at overcoming these challenges and fostering the empowerment of female entrepreneurs.

2. Literature Review

The international literature highlights the significance of the role of women entrepreneurs in fostering economic and social growth, creating new opportunities for innovation and employment. According to the World Bank Report (2021), women entrepreneurs contribute significantly to global economic development, improving economic stability and creating new employment opportunities. However, cultural challenges, such as social norms and gender biases, remain substantial barriers for women leading businesses, limiting their opportunities for equal representation across various economic sectors (OECD, 2021). Gender stereotypes and societal perceptions, which often view women as more suitable for traditional caregiving roles, negatively impact their ability to engage and succeed in business and entrepreneurial fields (ILO, 2021). A study by UN Women (2022) argues that the COVID-19 pandemic has exacerbated women's efforts to balance their family and professional responsibilities, thereby intensifying existing cultural challenges. Women have faced heightened demands and doubts regarding traditional roles and the division of labor within the household, worsening both economic and cultural challenges. This negative impact is more pronounced in developing economies, where cultural norms and stereotypes are more entrenched and harder to change. Consequently, women's participation in businesses and specific economic sectors remains restricted (World Economic Forum, 2022).

Developed Countries: The USA, United Kingdom, Germany, and Switzerland

In the United States, women entrepreneurs have succeeded in developing businesses across various fields, including technology, services, and healthcare. According to a report by the National Women's Business Council (2021), women lead more than 40% of small businesses in the country but continue to face significant cultural and structural barriers. Cultural norms that perceive women as more suitable for family caregiving roles often hinder their pursuit of careers in advanced and lucrative sectors (McKinsey & Company, 2020). Additionally, women entrepreneurs have limited access to venture capital, while their underrepresentation in professional networks places them at a disadvantage in advancing and developing their businesses.

In the United Kingdom, support for women entrepreneurs is emphasized through initiatives such as the *Rose Review of Female Entrepreneurship*. This program has helped women overcome funding barriers and provided opportunities for essential support and mentoring, critical for developing successful enterprises. However, cultural challenges related to traditional gender norms remain prevalent. Women often feel marginalized and face greater difficulties in building professional networks and managing businesses in dominant industry sectors (Carter et al., 2020). Furthermore, gender inequalities in pay levels and representation in leadership positions continue to negatively affect the long-term success of women-led businesses.

In Germany, the *EXIST Women* program provides support for women creating innovative businesses, primarily in the technology and science sectors (KfW Research, 2021). This program has made a noticeable difference for women entrepreneurs, enabling them to develop and manage businesses that face intense competitive challenges. In Switzerland, initiatives like the *Swiss Female Entrepreneurship Program* have highlighted the importance of mentoring and skill development to help women overcome cultural barriers often present in countries with traditional family norms and gender expectations (Siegrist et al., 2020). Nonetheless, cultural challenges persist, with many women continuing to face difficulties associated with traditional roles dividing family and professional responsibilities.

Developing Economies: India and South Africa

In India, women entrepreneurs are often confined to low-profit-margin sectors due to traditional norms that limit their participation in high-growth-potential businesses (Kabeer, 2020). Studies show that cultural challenges and gender norms prevent women from developing and scaling their businesses beyond traditional constraints. Women who attempt to establish businesses often face negative perceptions that undervalue their capabilities and consider them unsuitable for leading large and innovative organizations. In South Africa, cultural challenges and traditional norms similarly hinder women from participating in male-dominated markets and industries. In this country, initiatives aimed at creating training opportunities and professional networks often face implementation difficulties, leaving many women without the necessary resources to engage and advance (World Bank, 2022).

Western Balkans: Kosovo and Albania

In Kosovo and Albania, women entrepreneurs face similar obstacles. Gender stereotypes and traditional norms are among the primary barriers women must overcome to establish and grow businesses. According to the Riinvest Institute (2021), only 12% of businesses in Kosovo are led by women, reflecting a significant gender gap in entrepreneurship. In Albania, efforts such as those by UNDP have brought progress, but the lack of long-term supportive policies continues to challenge women entrepreneurs (UNDP Albania, 2020). Women in these countries are often restricted by cultural perceptions and norms that view sectors led by women as less significant or advanced than those led by men. Furthermore, the lack of mentoring opportunities and support from professional networks leaves women without the means to grow and develop sustainably.

The international literature and various reports emphasize that cultural barriers for women entrepreneurs are similar across many regions and countries. Gender stereotypes, traditional societal norms, and a lack of institutional support are some of the factors influencing the development of women-led businesses. However, best practices from developed countries, such as mentoring and the creation of supportive networks, can serve as models to address these challenges and enable the growth and development of female entrepreneurship in countries like Kosovo and Albania.

3. Methodology

This paper adopts a systematic literature review approach, focusing specifically on the cultural challenges impacting the development of female entrepreneurship. The methodology is designed to identify and analyse the influence of cultural norms, gender stereotypes, and structural barriers on the growth of women-led enterprises across various contexts.

Literature Selection: The selection process involved the use of key terms such as "Cultural barriers in female entrepreneurship" and "Gender stereotypes in entrepreneurship." Sources were drawn from peer-reviewed journals and reports by international organisations published between 2019 and 2024. Databases such as Scopus, Web of Science, ResearchGate, and Google Scholar were utilised to collect relevant materials.

Selection Criteria: The inclusion criteria focused on empirical studies and literature reviews addressing cultural challenges and supportive strategies for female entrepreneurs in diverse contexts.

Source Filtering: Only materials with direct relevance to the research topic were selected, excluding informal or unpublished sources.

Thematic Selection: Key themes were identified, including traditional gender norms, societal expectations, and discrimination in access to capital and professional networks.

Analysis Approach: A qualitative thematic analysis was conducted to identify key challenges, such as cultural norms, gender expectations, and the impact of stereotypes on women's opportunities for entrepreneurial success. This approach facilitated the synthesis of best practices and the identification of cultural barriers in countries such as the United States, Germany, Japan, and the Western Balkans.

Limitations: The study relied exclusively on published literature, excluding informal sources. Furthermore, the selection of resources was influenced by access to certain databases and specific reports. Nonetheless, this methodology provides a robust foundation for understanding and analysing cultural challenges while offering practical recommendations to enhance support for female entrepreneurs in Kosovo and Albania.

4. Findings

To address the aim of this paper, which seeks to analyze and compare the cultural challenges affecting female entrepreneurship at the global, regional, and local levels, key findings have been identified from the scholarly literature. These findings are categorized into three main contexts: the global landscape, developed countries, developing countries, and Kosovo and Albania, offering insights into the challenges and opportunities faced by women entrepreneurs in these settings.

At the global level, cultural challenges for women entrepreneurs are interconnected with traditional gender norms, social stereotypes, and restricted access to economic resources and professional networks. Women continue to encounter significant barriers, such as underrepresentation in high-potential sectors like technology and discrimination in accessing venture capital. For instance, only 2.3% of venture capital in the U.S. goes to women (McKinsey & Company, 2020). The literature suggests that, despite economic advancements, cultural norms still perpetuate common patterns of discrimination (Brush et al., 2019; OECD, 2021). Efforts to address these challenges are more advanced in developed countries, where supportive programs and networks for women entrepreneurs have been established.

The USA and the United Kingdom:

In the USA and the UK, supportive structures such as Women's Business Centers and Start-Up Loans help women address key challenges like access to capital and the creation of networks. However, gender stereotypes continue to negatively impact women's aspirations and confidence in developing their businesses (Carter et al., 2020). The percentage of women in innovative sectors like technology and sciences remains low, necessitating more integrated policies that promote gender equality (British Business Bank, 2021).

Germany and Switzerland:

In Germany, programs like *EXIST Women* have supported women in innovation sectors, while in Switzerland, mentoring and training are key pillars for integrating women into the entrepreneurial market (Siegrist et al., 2020). Despite the success of these programs, traditional expectations regarding gender roles, especially in rural areas, continue to limit women's participation in entrepreneurship.

India and South Africa:

In developing countries such as India and South Africa, challenges are more pronounced due to a lack of access to formal financing and institutional support. In India, women face traditional norms that restrict their opportunities to start their own businesses. Programs like *Stand-Up India* have supported women, but their impact remains limited due to a lack of widespread implementation and reach (Kabeer, 2020). Similarly, in South Africa, women often turn to informal economic sectors to start businesses, where they face a lack of legal security and financial support (World Bank, 2022).

Kosovo and Albania:

In Kosovo and Albania, women entrepreneurs face a combination of cultural and structural challenges. According to a report by Riinvest Institute (2021), only 12% of businesses in Kosovo are owned by women, most of which are concentrated in the services sector. Similarly, in Albania, efforts to empower women have increased awareness of gender equality, but supportive policies are often limited and fragmented (UNDP Albania, 2020). Traditional gender norms and women's roles

within the family influence their engagement in entrepreneurship, forcing them to confront challenges such as balancing family and professional responsibilities, the lack of support networks, and limited access to formal financing. In summary, cultural challenges for women entrepreneurs are numerous and vary across cultures, but efforts to address these challenges are becoming increasingly evident. Supportive interventions and integrated policies that promote gender equality are necessary to help women reach their potential in entrepreneurship, particularly in contexts like the Western Balkans.

| Category | Key Cultural Challenges | Best Practices in Addressing Cultural Challenges |
|---|---|--|
| Global | Traditional gender norms that limit women's opportunities in entrepreneurship. Cultural stereotypes that influence women's aspirations and confidence. | The creation of professional networks, mentoring, and training for women to strengthen their confidence and promote gender equality (Brush et al., 2019; OECD, 2021). |
| Developed Countries - USA and UK | Discrimination in access to capital, limitations on opportunities for women in innovative sectors. Cultural norms that support traditional roles for women. | The creation of support centers for women entrepreneurs such as Women's Business Centers, Start-Up Loans, and policies promoting gender equality in innovative sectors (McKinsey & Company, 2020; Carter et al., 2020; British Business Bank, 2021). |
| Developed Countries - Germany and Switzerland | Traditional gender role expectations that affect women's participation in entrepreneurship, especially in rural areas. | Support programs such as EXIST Women for empowering women in innovative sectors and education focused on training women in entrepreneurship and mentoring (Siegrist et al., 2020). |
| Developing Countries - India and South Africa | Traditional norms that prevent women from pursuing entrepreneurial opportunities, limiting opportunities in the formal sectors. | Support programs such as Stand-Up India for women entrepreneurs, interventions in the informal sector, and promotion of opportunities for women in business (Kabeer, 2020; World Bank, 2022). |
| Kosovo and Albania | Traditional gender norms that force women to balance family and professional responsibilities. The lack of supportive networks and access to funding. | Supportive policies for women entrepreneurs, training for innovation, and opportunities for mentoring. Development of support networks and opportunities for access to financing (Rinvest Institute, 2021; UNDP Albania, 2020). |

Table 1: Cultural Challenges and Best Practices for Female Entrepreneurship at the Global, Developed, Developing Countries, and Kosovo & Albania Levels

At the Global Level: Cultural challenges are significantly high due to pronounced gender stereotypes and the lack of support for women in innovative sectors. However, several supportive practices have been developed to address these challenges, including networks and organizations designed to empower female entrepreneurs.

In Developed Countries: While cultural challenges, such as gender norms, persist, supportive practices are well-established and have a considerable impact, particularly through structures like Women's Business Centers and mentoring programs. This reflects a noticeable improvement in addressing cultural challenges.

In Developing Countries: Challenges are more pronounced due to the lack of resources and support, especially in areas like financing and education. Supportive practices are still in the early stages and are often not widespread.

In Kosovo and Albania: Cultural challenges are clearly present, especially in the form of traditional norms and family-related barriers. Supportive practices remain limited but have grown as several initiatives have been created to support female entrepreneurship.

| Level | Cultural Challenges | Supportive Practices | Comments |
|-------|---------------------|----------------------|----------|
|-------|---------------------|----------------------|----------|

| | | | |
|----------------------|---------|------------------|---|
| Global | Many | Average | Gender discrimination and limited access to economic resources. |
| Developed Countries | Average | Many | Support structures such as Women’s Business Centers and Start-Up Loans. |
| Developing Countries | Many | Need Improvement | Lack of access to funding and institutional support. |
| Kosovo & Albania | Many | Average | Cultural challenges due to traditional norms and gender roles. |

Table 2: Presents an analysis of the cultural challenges and supportive practices that women entrepreneurs face at four different levels: global, developed countries, developing countries, and Kosovo & Albania.

Table 2: Presents an analysis of the cultural challenges and supportive practices that women entrepreneurs face across four different levels: global, developed countries, developing countries, and Kosovo & Albania. This table is structured into four main columns, with each category analyzed for the cultural challenges and supportive practices that assist women in entrepreneurship.

Global Level

Cultural Challenges: Women globally face significant cultural challenges related to traditional gender norms and social stereotypes. This includes low representation in high-potential sectors like technology and sciences, and discrimination in accessing capital, as evidenced by McKinsey & Company (2020), where only 2.3% of risk capital is invested in women-led businesses.

Supportive Practices: Global efforts to support women entrepreneurs are often scattered and varied, including the creation of support structures that offer access to capital and networks. However, the support provided remains limited, especially in innovative sectors and opportunities for mentoring and training for women entrepreneurs.

Developed Countries

Cultural Challenges: In developed countries, such as the USA and the UK, challenges include cultural norms and gender stereotypes that still negatively affect women's self-confidence and aspirations to grow their businesses. Despite supportive programs, women often feel constrained by societal and professional pressures.

Supportive Practices: These countries have more developed support structures for women entrepreneurs, such as Women’s Business Centers and Start-Up Loans, which offer financing and mentoring opportunities. However, women's participation in sectors such as technology and sciences remains low and requires more integrated policies to address gender inequalities.

Developing Countries

Cultural Challenges: In developing countries like India and South Africa, women face more pronounced cultural and structural challenges. Traditional norms, lack of access to finance, and institutional support create significant barriers for women entering entrepreneurship. In many cases, women are excluded from professional and financial growth opportunities.

Supportive Practices: Programs like Stand-Up India offer women opportunities to start businesses, but their impact is often limited due to a lack of widespread and continuous support. In South Africa, women are often forced to enter informal economy sectors to start businesses, increasing the risk and limiting access to financial support.

Kosovo & Albania

Cultural Challenges: Women in Kosovo and Albania face a combination of cultural and structural challenges, including traditional gender norms that require them to balance family and professional responsibilities. As a result, they often have fewer opportunities to participate in business or lead businesses. Moreover, challenges such as a lack of support networks and limited access to finance are widespread.

Supportive Practices: According to reports from the Riinvest Institute (2021), in Kosovo, only 12% of businesses are women-owned, and most are concentrated in small service sectors. Supportive policies and programs are limited and often fragmented, making an integrated and sustainable approach necessary to enhance opportunities for women in entrepreneurship.

5. Conclusions and Recommendations

In conclusion, the research on the cultural challenges affecting the development of women entrepreneurship has shown that cultural norms and gender stereotypes are the main obstacles women entrepreneurs face at the global, regional, and local levels.

At the global level, traditional cultural norms and gender stereotypes have a significant impact on women's opportunities to engage in entrepreneurship. Women are often faced with societal expectations to be more involved in family roles and childcare, limiting their opportunities to develop businesses. Despite progress in some countries, these norms still negatively influence women's aspirations and self-confidence in running businesses (OECD, 2021; Carter et al., 2020).

Another cultural challenge is the low representation of women in high-potential economic sectors, such as technology and sciences, where cultural norms often create barriers to women's inclusion. This occurs due to the mistaken belief that women are not suited for these industries, hindering their involvement in technology and science entrepreneurship (Brush et al., 2019).

In addition to visible cultural barriers, the invisible challenges related to cultivating self-confidence are also present. Women often struggle to develop aspirations to create their own businesses due to norms that frequently convey the message that entrepreneurs are expected to be men. This influence is also evident in the experiences of women in highly developed countries like the US and the UK (Carter et al., 2020).

In some cases, it is evident that changing cultural norms is a slow but necessary process. Although some programs and initiatives have improved opportunities for women, improving societal perceptions about women's entrepreneurial opportunities remains a major challenge. Women are often forced to confront stereotypes and prejudices that affect their ability to build supportive networks and obtain investments for their businesses (McKinsey & Company, 2020).

In Kosovo and Albania, cultural challenges are also present and have a significant impact. Traditional cultural norms and societal expectations for women, including family duties and traditional roles, make it difficult for many women to engage in entrepreneurship. Women face visible barriers in developing business ideas due to gender discrimination and cultural limitations imposed by society (Riinvest Institute, 2021).

Cultural challenges remain a significant barrier for women entrepreneurs, making it difficult for them to engage in and develop successful businesses. Traditional norms and gender stereotypes are present in many parts of the world and have a noticeable impact on the support women receive in starting and running businesses. Despite efforts to change these norms, there is a great need to address these challenges in order to create equal opportunities for women entrepreneurs.

Cultural Norms and Gender Stereotype Change

One of the main recommendations is to intensify efforts to change cultural norms and gender stereotypes that prevent women from engaging in entrepreneurship. Educational programs and societal awareness campaigns are essential to challenge traditional roles and encourage women to pursue entrepreneurial careers. Women's participation in social and professional initiatives can help change perceptions about their skills and opportunities.

Examples: Media campaigns promoting women entrepreneurs as success models, and integrating these initiatives into schools and universities to educate younger generations about equal opportunities for both women and men in entrepreneurship.

Support for Women Entrepreneurs in Innovation Sectors

To address the low representation of women in innovation sectors such as technology and sciences, it is necessary for governments and international organizations to create equal opportunities for women in these sectors. Programs that offer training, mentorship, and financial support for women in such sectors can help increase their representation.

Examples: Creation of mentoring groups and support networks for women in technology and sciences, as well as offering grants and financial opportunities dedicated to women entrepreneurs in these fields (e.g., innovation grants from international institutions).

Enhancing Women's Self-confidence

Boosting women's self-confidence and aspirations is a key aspect for the development of women entrepreneurship. This can be achieved by providing opportunities for personal and professional development, as well as creating opportunities for women to engage in supportive networks.

Examples: Leadership development programs for women and creating opportunities for training that enhance women's self-confidence to become leaders in entrepreneurship.

Engaging Men and Boys in Gender Norm Change

For true change to occur, it is necessary to involve men and boys in challenging gender stereotypes. This can help create a culture of support for women and increase awareness about gender equality.

Examples: Programs that encourage men and boys to support and motivate women in entrepreneurship, as well as help dismantle the myth that women cannot run successful businesses.

Creation of Policies Supporting Women Entrepreneurs in Rural Areas

In many cultures and countries, women living in rural areas face numerous cultural and economic challenges. Policies and programs that encourage and support women entrepreneurs in these areas are necessary to address these challenges and enable greater equality of opportunities.

Examples: Policies offering specialized training and support for women entrepreneurs in rural areas, as well as opportunities for access to markets and professional networks.

Integrating Cultural Challenges into Business Development Policies

Cultural challenges that have a direct impact on the development of women's entrepreneurship should be integrated into business development policies. Governments must include cultural and gender aspects in creating programs and policies to support entrepreneurs, offering equal opportunities for both genders.

Examples: Integrating gender equality and cultural challenges training into support policies for start-ups and new businesses.

Improving Education and Training for Women Entrepreneurs

Provide women with opportunities for advanced education and training in management, technology, and entrepreneurial skills to improve their positions and help shift cultural perceptions.

Examples: Creation of specific programs aimed at developing entrepreneurial skills for women, focusing on fields with high economic potential that remain underutilized by women.

These recommendations are crucial for overcoming cultural barriers and enabling a more equal and supportive environment for women entrepreneurs worldwide, particularly in regions where cultural challenges are more pronounced. Integrating these suggestions could increase opportunities and strengthen the impact of women in economic and social development.

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