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Coherence of Monetary and Fiscal Policy in the Function of Reducing Inflation in the European Union

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Abstract

This study aims to analyze the interactions between various fiscal and monetary determinants affecting inflation across 27 European Union (EU) member states from 2010 to 2023. Using the System Generalized Method of Moments (GMM) model, we investigate the impact of government deficits, unemployment, wages, central bank interest rates, and exchange rates on inflation dynamics. The results reveal a significant positive relationship between government deficits and inflation, highlighting the inflationary risks associated with persistent fiscal imbalances. Additionally, a negative correlation between unemployment and inflation aligns with the traditional Phillips Curve, indicating that rising unemployment tends to reduce inflationary pressures. The study also finds that wage growth positively influences inflation, necessitating careful management of fiscal policies to balance wage increases with productivity enhancements. Based on these findings, we recommend that EU policymakers adopt coherent fiscal and monetary strategies to stabilize inflation. This includes maintaining fiscal discipline, supporting employment through targeted programs, and aligning fiscal measures with monetary objectives. A synchronized approach will be crucial to achieving sustained price stability and fostering long-term economic growth in the EU.

Keywords: inflation, inflation suppression, monetary policy, fiscal policy, instruments of monetary policy, EU member states

JEL: E31; E37; E52.

1. Introduction

The ongoing debate between Keynesians and monetarists centers around the relative effectiveness of monetary and fiscal policies. While numerous empirical studies have explored these two macroeconomic tools, their results do not point to a definitive conclusion about which policy is superior. Rather, their effectiveness depends on the specific economic and political context at a given point in time (Rakić - Rađenović 2013). It is also crucial to consider the time lag between the implementation of policy measures and their eventual effects. For instance, the results of monetary policy may only become visible after three months to two years, and controlling inflation or reducing

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unemployment may require even more time (Gul et al. 2012).

Maintaining price stability is a fundamental goal of economic policy in any nation. This paper focuses on the persistent issue of inflation, which continues to challenge both developing and developed economies. The necessity of using monetary and fiscal policies as key tools to control inflation remains paramount. High inflation can hinder economic growth and reduce the living standards of a population, making the achievement of price stability a critical goal for policymakers. Tackling inflation effectively requires a coherent monetary framework, supported by appropriate fiscal measures.

Although monetary and fiscal policies are managed by separate institutions, they are highly interdependent and must be coordinated. Achieving the goals of one policy without undermining the objectives of the other is vital for macroeconomic stability. The lack of coordination between these two policies can lead to negative externalities, which can significantly affect overall economic performance (Ješić 2016). Therefore, optimal coordination between fiscal and monetary policy is often regarded as a superior solution compared to their isolated implementation.

This interdependence is most evident in areas such as budget deficit financing, public debt management, and the use of budget surpluses. For example, reducing the budget deficit can relieve inflationary pressures, making it easier for the central bank to maintain monetary stability (Bošković et al. 2013). Likewise, a coherent fiscal policy is necessary to complement the central bank's efforts to control inflation, especially if a restrictive monetary policy is implemented (Kvrgić et al. 2011).

In addition to managing aggregate demand, fiscal and monetary policies should also work together to influence aggregate supply. In times of economic stagnation, both policies need to stimulate supply by encouraging production activities and improving labor productivity (Komazec - Ristić, 1992). On the other hand, in periods of excess supply, these policies should promote demand growth through increased consumption.

The purpose of this study is to provide actionable insights and practical policy solutions for EU countries that are facing high inflation rates. By examining the quantitative impact of both monetary and fiscal policy instruments on inflation, the study aims to offer empirical evidence on which policy measures have been effective in controlling inflation. The focus is on identifying the most effective tools for inflation management in the European Union (EU), given the economic diversity across member states. This research seeks to contribute to the ongoing debate on how inflation can be managed through coordinated fiscal and monetary policies, particularly in the context of EU integration and economic disparities among countries.

The study addresses a significant gap in the literature by analyzing inflation dynamics across a broad spectrum of EU countries using a dataset that spans 2010-2023. While prior research has largely focused on individual countries or specific regions, this study takes a comprehensive approach by covering all 27 EU member states, thus providing a holistic view of inflation management across the EU. Furthermore, the study bridges the gap by considering both monetary and fiscal policy instruments simultaneously, offering a more nuanced understanding of how these policies interact to influence inflation. The division of the dataset into “old” and “new” EU countries

helps to shed light on the different economic realities and policy challenges faced by these groups, which has often been underexplored in previous studies that treat the EU as a homogenous entity.

The decision to split the panel into “old” and “new” EU countries is motivated by the need to account for the heterogeneity between these two groups, which may lead to different inflationary dynamics and policy effectiveness. "Old" EU countries, typically Western European states, have more mature and established economies, characterized by higher levels of economic development, monetary stability, and institutional strength. In contrast, "new" EU countries, largely from Eastern Europe, have transitioned to market economies more recently, and often face distinct fiscal challenges, structural reforms, and inflation pressures.

By splitting the panel, the study aims to capture these differences and provide tailored insights for each group. This approach allows for a more accurate assessment of how fiscal and monetary policies affect inflation in economies with different institutional frameworks, levels of economic development, and inflationary histories. Ultimately, this split aligns with the study’s goal of providing nuanced and practical solutions to inflation management for both groups of EU countries.

The remainder of the paper is organized as follows: Section 2 reviews the relevant literature, Section 3 introduces the data and presents stylized facts, Section 4 outlines the econometric framework, Section 5 discusses the empirical results and sensitivity checks, and Section 6 concludes with policy implications.

2. Literature review

The need to analyze the interactions and effects of fiscal and monetary policies is related to three interdependent fields of research, which at the same time represent the basis for a dominant part of the conducted empirical research in this field (Kuttner 2002): firstly, the impact of fiscal policy on fundamental goals/determinations of monetary policy; secondly, the implications of strategic interactions between fiscal and monetary authorities; and thirdly, the impact of fiscal and/or monetary policy on the structure of final consumption and production as well as on other macroeconomic variables. Therefore, it is crucial to provide a concise overview of pertinent empirical studies, specifically focusing on the third category of research, which explores the interplay between these two policies and their consequences on the overall economic landscape.

In Nguyen's (2015) study, two distinct estimation methods were employed: PMG estimation and the differenced panel GMM Arellano-Bond estimation. These methods were utilized to investigate the influence of fiscal deficits and the supply of broad money M2 on inflation in a group of Asian countries during the period spanning from 1985 to 2012. The findings of the analysis reveal that the supply of broad money M2 exerts a notably positive effect on inflation, a result observed exclusively through the PMG estimation method. On the other hand, fiscal deficit, government expenditure, and interest rates were identified as statistically significant factors affecting inflation in both of the estimation methods utilized in the study.

Belke - Gros (2015) use panel vector autoregression (VAR) models to investigate the impact of fiscal and monetary policy variables on inflation in a panel of EU

countries over the period 1999-2013. The authors find that both fiscal and monetary policy variables significantly influence inflation in the EU. Expansionary fiscal policy leads to higher inflation, while higher interest rates lead to lower inflation. The authors' findings are consistent with the economic theory of inflation. They are also important because they suggest that policymakers in the EU should be mindful of the potential inflationary impact of fiscal policy.

Rault - Sova (2015) use panel vector autoregression (VAR) models with fixed effects to investigate the impact of fiscal policy shocks on inflation in a panel of 27 EU countries over the period 1995-2013. They find that fiscal policy shocks significantly impact inflation in EU countries. Expansionary fiscal policy shocks lead to higher inflation, while fiscal consolidation shocks lead to lower inflation. The authors' findings are important because they suggest that fiscal policy can have a significant impact on inflation in the EU. This is important because inflation can have a number of negative consequences for the economy, such as reducing economic growth and increasing uncertainty for businesses and consumers. The authors' findings are also consistent with the findings of Belke - Gros (2015), who found that both fiscal and monetary policy variables significantly influence inflation in the EU.

Arghyrou - Kontonikas (2019) use panel data analysis with fixed-effects models to investigate the impact of fiscal policy variables (government debt and fiscal imbalances) on inflation during the sovereign debt crisis in a panel of 17 EU countries over the period 2009-2015. The authors find that higher government debt levels and fiscal imbalances during the crisis had inflationary effects in the EU. This is likely due to a number of factors, including increased demand, weaker currency and loss of confidence. The authors' findings are important because they suggest that fiscal policy can have a significant impact on inflation, even during times of crisis. Policymakers in the EU should be mindful of the potential inflationary impact of fiscal policy and ensure that fiscal policy is consistent with the ECB's objective of price stability.

Berger - Hefeker (2019) use panel data analysis with fixed-effects models to investigate the impact of fiscal decentralization on inflation volatility in the euro area over the period 1999-2016. They find that fiscal decentralization has a dampening effect on inflation volatility. This suggests that more fiscally decentralized countries in the euro area tend to experience lower and more stable inflation. The authors' findings are important because they suggest that fiscal decentralization can help to reduce inflation volatility in the euro area. This is important because inflation volatility can have a number of negative consequences for the economy, such as reducing economic growth and increasing uncertainty for businesses and consumers.

The authors' findings are also consistent with the findings by Mohseni-Cheraghlou - Rault (2019), who found that institutional factors can influence the effectiveness of fiscal policy on inflation.

The research by Berger - Hefeker (2019) provides further evidence that fiscal decentralization can have a positive impact on macroeconomic stability in the euro area. Mohseni-Cheraghlou - Rault, (2019) use panel data analysis with fixed-effects models to explore the impact of fiscal and monetary policy variables on inflation in a panel of 27 emerging and developing countries over the period 1990-2015. The authors find that the effectiveness of fiscal and monetary policies

on inflation is influenced by institutional factors, such as the quality of government, the level of corruption, and the rule of law. Their findings suggest that policymakers in emerging and developing countries should focus on improving institutional quality in order to enhance the effectiveness of their macroeconomic policies.

Binici et al. (2022) employed monthly data and utilized the Generalized Dynamic Factor and Local Projection econometric techniques to analyze a dataset encompassing 30 European countries over the period spanning from 2002 to 2022. Their research aimed to delve into the factors responsible for the surge in consumer price inflation following the pandemic. The study revealed that although global factors still played a substantial role in influencing inflation dynamics across Europe, there was an increasing significance of country-specific factors. These included the responses of individual nations through their monetary and fiscal policies to the crisis, which gained greater prominence in shaping consumer price inflation during the pandemic period.

3. Data and methodology

To analyze determinants of inflation in EU countries we construct a sample of 27 EU member states[1] for the period 2010-2023. Given the nature of our dataset, we employ panel data analysis. Maddala - Wu (1999) argue that one of the main advantages of panel data compared to other types of data is that the approach allows for testing and adjustment of the assumptions that are implicit in cross-sectional analyses. Bearing in mind that these countries vary considerably, in this study we follow Petkovski et al.(2023) and we classify the 27 EU Member States into two more homogenous sub-groups: (1) EU-16 (Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, and Sweden); and (2) 11 countries from Eastern Europe (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia).

The Harmonized Index of Consumer Prices (HICP) is used as the dependent variable in inflation studies, reflecting the general price level. Most empirical studies define inflation as the rate of change in the Consumer Price Index (CPI) (Catao - Terrones 2005). In contrast, some studies utilize GDP deflator changes (Alfaro 2005) or money value depreciation rates (Chrigui et al. 2011). The consensus in literature supports using logarithmic transformations of dependent variables (logINF) to mitigate outliers and address non-linearities (Catao - Terrones 2005). The HICP, compiled by Eurostat and national statistical offices using standardized methods, offers a more accurate measure of inflation than the CPI, enabling reliable international comparisons.

Wage growth, integral to cost-push inflation theory, affects consumer purchasing power and inflation dynamics. Studies present mixed results on the relationship between wage growth and inflation; some suggest prices lead wage growth (Emery - Chang 1996), while others find no causal link (Hess – Schweitzer 2000). In the Visegrád countries, understanding wage growth is essential for managing inflationary pressures, thus our

[1] The EU member states are Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

analysis employs average annual wages in constant prices.

Exchange Rate Pass-Through theory highlights how different exchange rate regimes affect import prices and inflation (Gagnon - Ihrig 2004). Research suggests pegged exchange rate regimes typically lead to lower inflation but may hinder output growth (Ghosh et al. 1997; Rogoff et al. 2003). Fixed regimes stabilize import prices, controlling inflation, whereas floating rates can lead to volatility, affecting domestic inflation. In the Visegrád countries, exchange rate movements significantly influence import costs and inflation rates.

Guided by the Taylor Rule, real interest rates are pivotal in shaping inflation (Taylor 1993). Low or negative real rates encourage borrowing and spending, potentially increasing inflation, while high rates dampen demand and inflation.

Unemployment plays a critical role in shaping inflation dynamics, as highlighted by the Phillips Curve, which suggests an inverse relationship between inflation and unemployment. Empirical studies have consistently demonstrated that higher unemployment rates are associated with lower inflationary pressures, as decreased demand in the economy reduces upward pressure on prices (Gordon 1997; Ball - Mankiw 2002). For instance, data from the Eurostat indicates that during periods of elevated unemployment in the EU, such as the aftermath of the 2008 financial crisis, inflation rates remained subdued, underscoring the need to consider unemployment in inflation analysis.

Trade openness is another crucial determinant of inflation, particularly in small, open economies like those in the EU. Increased trade can enhance competition and lead to lower prices for consumers, thus exerting downward pressure on inflation (Romer 1993). Additionally, research by Tressel - Prati (2006) found that trade liberalization often results in greater price stability, as imported goods help to mitigate domestic inflationary pressures. The EU's commitment to free trade and its single market has further reinforced the importance of including trade in inflation studies.

Considering the impact of general government final consumption expenditure as a percentage of GDP on inflation in the European Union (EU) is important because it reflects the level of government spending in the economy. According to neo-classical economists, an increase in government spending, especially under the assumption of full employment, can lead to higher inflation (Olayungbo 2013). Fiscal policy in many countries faces various challenges, such as difficulties in tax collection, institutional weaknesses, and limited access to foreign capital. Additionally, the practice of printing money to finance public expenditures often results in inflationary pressures. Consequently, government spending can have inflationary effects in addition to its influence on production (Georgantopoulos - Tsamis 2010). This inflationary impact is particularly pronounced in economies operating at or near full capacity, where additional government spending might drive up prices due to limited availability of resources. Moreover, prolonged periods of increased government expenditure can lead to structural inflation, where price levels continuously rise even in the absence of further spending increases. The effectiveness of government spending in stimulating economic growth can be undermined by these inflationary effects, as higher inflation erodes purchasing power and can destabilize the economy. Policymakers must therefore

carefully balance the benefits of increased government spending against the potential risk of triggering inflation, especially in contexts where fiscal expansion is necessary to address economic downturns.

The COVID-19 pandemic caused a global rise in sovereign debt, with advanced economies seeing their debt-to-GDP ratio increase from 103.9% in 2019 to 112.5% in 2022, and emerging markets from 55.1% to 64.6% (IMF 2022). This surge has raised concerns about the impact of high public debt on monetary policy and inflation. Elevated debt levels can complicate central banks' ability to manage inflation, as higher interest rates to curb inflation might increase debt servicing costs, potentially leading to fiscal dominance and inflationary pressures (Cochrane 2023). The fiscal theory of the price level suggests that fiscal pressures, including public debt, significantly influence inflation (Kwon et al. 2006). Empirical studies show mixed results: some find that high public debt correlates with increased inflation, especially in developing economies (Reinhart - Rogoff 2010; Van Bon 2015), while others argue the effect is negligible or context-dependent (Janssen et al. 2003; Kwon et al. 2006). These findings underscore the importance of including the real growth rate of government debt as a determinant in inflation analysis, as it captures the dynamic interplay between fiscal policy and inflation.

Tax revenue is also relevant, as higher taxes can lead to reduced disposable income, consequently lowering aggregate demand and inflation. According to the contractionary fiscal policy framework, increasing taxes can cool an overheating economy and help control inflation (Auerbach - Gorodnichenko, 2013). Empirical evidence suggests that during times of fiscal consolidation, characterized by rising tax revenues, inflation rates tend to decrease as aggregate demand contracts.

Finally, fiscal deficits are a critical factor influencing inflation dynamics. The positive correlation between government deficits and inflation is well-documented, as higher deficits can lead to increased demand beyond an economy's productive capacity, driving up prices (Sargent - Wallace 1981). In the context of the EU, countries with persistent fiscal deficits have often experienced higher inflation rates, highlighting the importance of fiscal discipline in maintaining price stability.

We included a dummy variable for EMU membership in the model to account for the influence of being a member of the Economic and Monetary Union (EMU). This is particularly relevant when considering the role of monetary policy, which is determined by the European Central Bank (ECB) for EMU members. The inclusion of this dummy variable allows us to assess how EMU membership, and thus having monetary policy decided by the ECB, impacts the dependent variables, alongside other controls for monetary policy. This ensures a more comprehensive analysis of the monetary policy framework within the model. In the model, the dummy variable for EMU membership is coded as follows: it takes the value of 0 if a country is not a member of the EMU, and 1 for the years when a country joined the EMU. This allows us to differentiate between countries that are members and non-members and capture the effect of EMU membership on the relevant economic variables from the point of entry into the union.

We have also introduced a crisis dummy variable that captures the period affected by the Eurozone sovereign debt crisis and the European Stability Mechanism (ESM) interventions and have value 1 for 2010, and 0 for the other period. This addition allows

us to better isolate the effects of this critical period on our dependent variable. We have updated the manuscript accordingly and have also incorporated relevant references, including those suggested by the reviewer, to strengthen the discussion.

The data for the selected variables were obtained from the World Bank's World Development Indicators (WDI) database, OECD, ECB, and EUROSTAT. Table 1 presents the variables in the model in greater detail.

We also present descriptive statistics for all countries, and we additionally discuss the main trends in the evolution of the selected variables over time.

Before analyzing the regression panel model, a correlation matrix was formed between variables and an analysis of Pearson's correlation coefficients was carried out. Namely, we will estimate the correlation between selected determinants to check possible problems of multicollinearity between them. We will have a multicollinearity problem if the correlation between selected determinants is above 0.80 Gujarati - Porter (2009) and simultaneous inclusion of the variable in the model should be avoided. According to the results from Table 3, there are no multicollinearity problems between selected determinants.

Table 1. Definition of variables.

Variables	Symbol	Units	Source	Expected sign
Harmonized Index of Consumer Prices	HICP	Annual average index (2015=100)	Eurostat	
Average annual wages	WAGE	Constant prices (2015=100)	OECD.STAT	+
Exchange rate	EXR	EUR/USD	ECB Data Portal	-
Interest rate of Central Banks	CBI	(Percent %)	European Central Bank and web sites of Central Banks	-
Unemployment	UNP	(% of total labor force) (national estimate)	World Bank's World Development Indicators (WDI) database World Development Indicators	-
Trade		Percent of GDP		-
Real growth rate of government debt	DEBT	Percent of GDP		+
General government final consumption expenditure	GGFC	Percent of GDP		+/-
Tax revenue (% of GDP)	TAXR	Percent of GDP		-
Deficit	DEF	Percentage of gross domestic product (GDP), General government, Net lending (+)/net borrowing (-)	EUROSTAT	+
EMU membership	EMU	Value of 0 if a country is not a member of the EMU, and 1 for the years when a country joined the EMU	DUMMY Variable	-/+
Eurozone sovereign debt crisis	ESDC	Value 1 for 2010, and 0 for the other period	DUMMY Variable	-/+

Table 2. Descriptive statistics.

	HICP	WAGE	EXR	CBI	UNP	DEBT	GGFC	TAXR	DEF
Mean	105.56	260757.80	1.19	1.06	8.38	164.43	20.02	20.86	-2.82
Median	101.46	36463.98	1.17	0.20	7.09	163.50	19.65	21.06	-2.50
Maximum	161.55	5382022.00	1.37	13.00	27.69	352.00	27.37	36.50	4.10
Minimum	90.04	5366.00	1.05	-0.75	2.02	1.00	11.38	10.55	-32.10
Std. Dev.	11.49	900010.20	0.10	1.79	4.55	107.79	3.16	4.85	3.53
Observations	378	364	378	378	378	378	378	351	378

Source: Authors' calculations.

Table 3 Correlation matrix

	HICP	WAGE	EURUSA	CBI	UNP	DEB	GGFC	TAXR	DEFICIT
HICP	1.00	0.11	-0.51	0.37	-0.32	0.00	0.02	0.01	0.06
WAGE	0.11	1.00	-0.01	0.36	-0.14	0.28	0.08	0.11	-0.02
EURUSA	-0.51	-0.01	1.00	0.04	0.28	0.03	0.07	-0.06	-0.37
CBI	0.37	0.36	0.04	1.00	-0.12	0.18	-0.12	-0.16	-0.16
UNP	-0.32	-0.14	0.28	-0.12	1.00	-0.22	-0.03	-0.04	-0.42
DEB	0.00	0.28	0.03	0.18	-0.22	1.00	0.11	-0.08	-0.02
GGFC	0.02	0.08	0.07	-0.12	-0.03	0.11	1.00	0.31	-0.08
TAXR	0.01	0.11	-0.06	-0.16	-0.04	-0.08	0.31	1.00	0.22
DEFICIT	0.06	-0.02	-0.37	-0.16	-0.42	-0.02	-0.08	0.22	1.00

Source: Authors' calculations.

Summary statistics for all variables used in the analysis, presented in Table 2, demonstrate considerable heterogeneity across countries and over time.

Furthermore this section outlines the econometric method chosen to investigate the relationship between selected determinants and inflation. As our research aim is to distinguish between short term and long-term determination of inflation, thus, dynamic panel model modelling is a suitable method of estimation (Baltagi 2008). This is particularly important if we know that institutional changes most often have long term effects (Acemoglu et al. 2002; Acemoglu - Johnson, 2003; Efendic - Pugh, 2015), and it is the impact we also want to investigate.

Bond (2002) emphasizes that dynamic relations in analyzing the base process can be decisive for proper and consistent estimations of parameters of the observed independent variables. Specific characteristics of the sample covering 27 countries over 13 years, or the situation when T < N, is an important argument for choosing a dynamic panel model (Greene 2008). The dynamic panel model is also a good method of estimation when potential endogeneity is considered, which is the case in our model (Greene 2008). The dynamic panel model offers the possibility of generating internal instruments

(external ones are typically difficult to find), so the treatment of potential endogeneity is comprehensive and the estimations more consistent (Roodman 2007; Baum 2006).

Various econometric methods are available for estimating dynamic panel data models. The dynamic panel data approach is advantageous as it accounts for the endogeneity of explanatory variables and considers unobservable, time-invariant country effects (Baek 2016; Yerdelen - Tatoglu 2018). To address the issue of endogeneity, Arellano - Bond (1991) introduced the difference generalized method of moments (difference GMM), which uses instrumental variables to derive GMM estimates of the relevant moment conditions. This method involves taking the first difference of the regression equation to eliminate individual fixed effects, using lagged variables as instruments for endogenous variables in the differenced equation. While this approach effectively mitigates endogeneity concerns, it may suffer from "weak instruments" in finite samples, leading to reduced precision (Bond et al. 2002). To overcome this limitation, Arellano - Bover (1995) and Blundell - Bond (1998) proposed the system GMM estimator, which enhances the difference GMM by using lagged variables as instruments in both the differenced and level equations.

$$y_{it} = \sum_{j=1}^{p} \alpha_j y_{i,t-j} + x_{it}\beta_1 + w_{it}\beta_2 + \\ + v_i + \varepsilon_{it} i = 1,\ldots, Nt = 1,\ldots, T \quad (1)$$

Where the α_j is p parameters to be estimated, i_t is a $1 \times k_1$ vector of strictly exogenous covariates, β_1 is a $k_1 \times 1$ vector of parameters to be estimated, i_t is a $1 \times k_2$ vector of predetermined or endogenous covariates, β_2 is a $k_2 \times 1$ vector of parameters to be estimated, v_i are the panel-level effects (which may be correlated with the covariates), and ε_{it} are *i.i. d*. over the whole sample with variance $\sigma 2\in$. The *vi* and the $\in it$ are assumed to be independent for each *i* overall *t*.

There are several compelling reasons for favoring system GMM over difference GMM in empirical analysis. First, when dealing with variables close to a random walk, lagged levels of the regressors, as utilized in difference GMM, tend to be poor instrumental variables (IVs) for the first-differenced regressors (Arellano - Bover 1995). Second, unbalanced panels can exacerbate data gaps when employing first differences, a characteristic of difference GMM. Third, the standard errors associated with different GMM are often biased downwards (Blundell - Bond 1998). Fourth, difference GMM tends to perform inadequately with small sample sizes, whereas system GMM exhibits better properties in such scenarios (Blundell - Bond 2000). Fifth, system GMM provides additional IVs by incorporating a second equation, wherein variables in levels are instrumented with their first differences (Arellano – Bover 1995). Sixth, the use of more IVs in system GMM enhances estimation efficiency compared to difference GMM. Seventh, system GMM is better suited for modeling non-stationary data and accommodating predetermined explanatory variables. Eighth, it effectively controls for inertia in variables, preventing biased and inconsistent estimations (Blundell and Bond, 1998).

Most of our System GMM estimations are based on two to three lags of the endogenous variable in our instrument set. This strategy aims to keep the number of instruments low, preventing overfitting and includes the lag of our dependent variable of interest. The latter helps avoid any bias due to the large number of instruments in a relatively small sample

(Petkovski et al. 2023). Related to this, we address the downward bias of standard errors in two-step GMM by using the correction proposed by Windmeijer (2005), which is implemented by the *xtabond2* syntax. System GMM has two variants: one-step and two-step estimation methods. The distinction lies in whether the weight matrix is homoscedastic or heteroscedastic. The two-step estimators are often considered more efficient because they reduce bias in the standard errors of estimation values, particularly in small samples (Bond et al. 2002). However, as the number of periods increases, system GMM may generate numerous instrumental variables, which can lead to model overfitting and poor model specification (Roodman 2009). Thus, a one-step system GMM is recommended for models involving a small number of countries over a longer period, while a two-step system GMM is more suitable for models with a larger number of countries over a shorter period (Teixeira - Queirós, 2016). Given that our analysis covers data from 27 EU countries over 11 years, we opt for the two-step system GMM over the one-step approach.

To ensure the consistency of our GMM estimation results, we subject our instruments to two specification tests. Firstly, the application of the Hansen test of over-identifying restrictions provides no evidence to reject the validity of the instruments. Secondly, we employ a second-order autocorrelation test to assess whether our error terms exhibit serial correlation. *M1* and *m2* tests demonstrate a first-order serial correlation in the first-difference equation but detect no evidence of second-order serial correlation.

4. Empirical results

In this section, we present the results of the econometric analysis of the coherence of monetary and fiscal policy in the function of reducing inflation in the European Union.

The first step of our empirical analysis is to perform panel unit root tests (Table 4). As

Table 4. Panel unit root tests

	Im, Pesaran and Shin W-stat	ADF-Fisher Chi square	PP-Fisher Chi-square	Conclusion
Variables	At a level	At a level	At a level	
HICP	-3.241***	97.11***	98.97***	I(0)
WAGE	-1.289*	69.62***	162.5***	I(0)
UNP	-1.290*	60.75	108.3***	I(0)
CBI	-1.437***	68.10***	99.06***	I(0)
EXR	-9.727***	193.3***	337.2***	I(0)
TRADE	-1.662***	71.51**	106.4***	I(0)
DEF	-2.063***	68.49***	115.9***	I(0)
TAXR	-1.437**	68.10**	99.06***	I(0)
GGFC	-1.933***	71.15***	67.36***	I(0)
DEB	-1.407**	55.04	72.33***	I(0)

Note: *, ** and *** indicate that the test statistic is significant at the 10%, 5%, or 1% level.
Source: Authors' calculations.

already mentioned in the previous section, we apply panel-IPS unit root tests and Fisher-type tests using ADF and PP-test, as outlined by Maddala and Wu (1999).

These tests are performed at level for all variables. Bearing in mind the traditional null hypothesis of stationarity, the results indicate acceptance of stationarity at levels indicating that all series are I (0).

Next from table 5, the Hansen test for overidentifying restrictions yields a p-value of 0.519, indicating that the instruments used in the model are valid and uncorrelated with the error term. This suggests that the GMM estimation is reliable and the instruments are appropriately specified. Additionally, the Arellano-Bond test for serial correlation shows significant AR(1) with a p-value of 0.004, implying first-order autocorrelation in the differenced residuals. However, the AR(2) test results in a p-value of 0.857, indicating no evidence of second-order serial correlation. This is crucial, as the absence of AR(2) serial correlation confirms that the model's moment conditions are correctly specified and that the lagged values used as instruments are valid. Together, these tests affirm the robustness of the dynamic panel data model.

The coefficient for the lagged inflation rate (HICP) is positive and highly significant, suggesting that inflationary inertia plays a critical role in the dynamics of inflation. This result is consistent with theoretical expectations, as inflation tends to exhibit persistence over time. Such persistence implies that inflation in one period is strongly influenced by past inflation, which can be challenging for policymakers aiming to stabilize prices. The implication here is that both fiscal and monetary policies need to be forward-looking and preemptive to curb inflation effectively. The European Central Bank (ECB), through its monetary policy, must remain vigilant about inflation expectations and take proactive measures when necessary. At the same time, fiscal authorities should ensure that public spending does not exacerbate inflationary pressures, especially when inflation is already entrenched in the economy.

One of the most interesting results in this analysis is the negative sign on unemployment (UNP). According to the findings, a rise in unemployment leads to a decrease in inflation, consistent with the traditional Phillips Curve relationship, where inflation and unemployment are inversely related. This result aligns with previous literature, including studies by Gordon (1997) and Ball - Mankiw (2002), which have also found evidence of this trade-off between inflation and unemployment. The negative relationship in this case further suggests that when unemployment rises, demand in the economy tends to fall, reducing upward pressure on prices. This finding reinforces the importance of fiscal policies aimed at maintaining employment levels. When combined with monetary policies that focus on price stability, fiscal policies that support labor market conditions can indirectly help manage inflation.

The positive coefficient for wages (WAGE) suggests that an increase in wages is associated with rising inflation. This relationship supports the notion that wage growth can lead to higher consumption and demand-pull inflation, where rising demand leads to upward pressure on prices. These results are in line with Blanchard - Katz (1999), who noted that wage inflation, particularly in tight labor markets, tends to drive consumer price inflation. Fiscal authorities need to be cautious about policies

Table 5. Empirical results

Variable	EU Countries (all)	EU Countries (old)	EU Countries (new)
HICP(-1)	1.080*** (0.076)	1.152*** (0.070)	0.2940** (0.1584)
WAGE	0 .6103*** (0.1927)	0.111*** (0.037)	0.0580*** (0.0237)
UNP	-0.001* (0.002)	-0.001** (0.0007)	-0.0082 (0.0063)
CBI	-0.020*** (0.003)	-0.013*** (0.002)	-0.0189*** (0.0064)
EXR	0.118*** (0.033)	0.088*** (0.024)	0.8674*** (0.4782)
TRADE	-0.00007 (0.00004)	-0.004* (0.003)	-0.0025*** (0.0010)
DEF	0.0409*** (0.0124))	0.0003* (0.0009)	0.0231*** (0.0114)
TAXR	-0.006** (0.007)	0.003 (0.002)	-0.0283*** (0.0133)
GGFC	-0.003 (0.003)	0.00008*** (0.00003)	-0.0513*** (0.0250)
DEB	-0.0005 (0.0003)	0.0004*** (0.0002)	-0.0001 (0.0001)
EMU	-0.050 (0.035)	-0.275*** (0.087)	-0.2183* (0.1247)
ESDS	-0.108 (0.452)	-0.671 (0.634)	-0.581 (0.631)
Constant	-2.2688*** (0.4833)	0.5985 (0.4811)	-3.3874*** (1.4191)
Number of observations	312	180	132
Number of countries	27	16	11
Arellano-Bond test for AR(1) in first differences	0.002	0.003	0.018
Arellano-Bond test for AR(2) in first differences	0.340	0.148	0.354
Hansen test of the validity of instruments (p-value)	0.232	0.974	0.384

Source: Authors' calculations.

that excessively stimulate demand in such an environment, as this could exacerbate wage pressures and lead to higher inflation. On the monetary policy side, the central bank may need to tighten monetary conditions if wage growth begins to outpace productivity, leading to inflationary pressures.

The role of central bank interest rates (CBI) is also critical in understanding inflationary dynamics. The positive and significant coefficient suggests that when central bank interest rates rise, inflation tends to increase in the short run. While this may seem counterintuitive, it could reflect the transmission lags associated with monetary policy. Initially, higher interest rates may increase the cost of borrowing and raise the cost of production for businesses, which could be passed on to consumers as higher prices. Over time, however, as monetary policy tightens further, the higher interest rates would be expected to reduce inflationary pressures by curbing demand. This underscores the importance of timing and coordination between fiscal and monetary policies. If fiscal authorities engage in expansionary policies while the central bank is raising interest rates to combat inflation, the policies could work at cross-purposes, reducing the effectiveness of the monetary tightening. Therefore, coherent policy coordination is essential to ensure that fiscal expansion does not offset the intended effects of monetary policy.

The findings for fiscal variables are particularly relevant in the context of this study. The coefficient for government deficits (DEF) is positive and statistically significant, indicating that higher fiscal deficits are associated with higher inflation. This result is consistent with the literature on the inflationary effects of fiscal policy, where large and persistent deficits can lead to inflation by increasing aggregate demand beyond the productive capacity of the economy. Studies by Sargent - Wallace (1981) and more recently by Auerbach - Gorodnichenko (2013) support the notion that excessive fiscal deficits can fuel inflation, especially if they are monetized by the central bank. This finding highlights the need for prudent fiscal policies that align with the monetary goals of inflation control. Coordinated fiscal and monetary actions are essential, as fiscal discipline helps to reduce inflationary pressures and supports the central bank's efforts to maintain price stability.

Moreover, the negative coefficient for tax revenues (TAXR) suggests that higher tax revenues are associated with lower inflation. This relationship can be explained by the fact that higher taxes reduce disposable income and, consequently, aggregate demand, which tends to lower inflationary pressures. This finding aligns with the theoretical underpinnings of contractionary fiscal policy, where increasing taxes can cool an overheating economy and reduce inflation. Fiscal authorities can use taxation as a tool to manage demand-side inflationary pressures, but this must be done in coordination with monetary policy to avoid conflicting effects. For instance, if the central bank is aiming to stimulate the economy through lower interest rates, aggressive tax increases could counteract these efforts, leading to suboptimal outcomes for both inflation and growth.

The coefficient for general government final consumption (GGFC), although not statistically significant in this study, points to the need for further investigation. Government consumption can influence inflation through its impact on aggregate demand, and while the current results do not find a strong link, other studies, such as Afonso - Sousa (2012),

have noted that government spending can have inflationary effects, particularly when it leads to a crowding-out of private investment or when financed through debt issuance. This potential for government spending to fuel inflation emphasizes the importance of fiscal restraint in periods of high inflation, ensuring that public expenditures are efficient and well-targeted to avoid unnecessary inflationary pressures.

Another notable result is the positive coefficient for the euro-dollar exchange rate (EXR), indicating that a depreciation of the euro against the dollar is associated with rising inflation. This finding is consistent with the pass-through effects of exchange rates on inflation, where a weaker domestic currency increases the price of imported goods, leading to higher overall price levels. Studies by Taylor (2000) and Campa - Goldberg (2005) have documented similar pass-through effects in other contexts. This underscores the importance of external factors in the inflation process and highlights the need for policymakers to consider exchange rate dynamics when designing inflation-targeting policies.

Finally, the coefficient for **trade openness (TRADE)** is not statistically significant, but its potential role in influencing inflation should not be overlooked. Increased trade openness can exert downward pressure on inflation by enhancing competition and lowering the cost of goods and services, as noted by **Romer (1993)** and **Tressel - Prati (2006).** However, the current results suggest that the inflationary impact of trade openness may be more complex in the European Union, possibly influenced by other structural factors such as sectoral composition and trade balances.

The next step of the regression analysis is to test the robustness of the results using the following models:

1) Fixed Effects Model - Fixed Effects Model and
2) Model of stochastic effects - Random Effects Model.

They are well documented in the literature, for example, in Wooldridge (2007). These econometric models control the heterogeneity in the sample and take into account the stationary FEM effects or specific modelled REM effects (Petkovski et al.,2022). In short, the analysis of fixed effects assumes that the units of interest are fixed, and that the differences between them are not of interest. However, the random-effects model, provides a lock to the population from which the sample was extracted (Kjosevski et al.,2021). In order to find out which model is suitable for our case, we will use the Hausman test. Bearing in mind the results we will continue with the appropriate model, and we will comment only that the results. To test the robustness of the results, we will examine three models. Firstly, we will include all monetary and fiscal variables and analyze their impact on inflation. Then, we will assess the influence of macroeconomic or fiscal variables alone on inflation.

First, based on the results of the Hausman test, it can be concluded that it is better to apply a model with fixed effects compared to a model with stochastic effects. The results show robustness of the results of our primary model GMM.

In conclusion, the findings of this study demonstrate that both fiscal and monetary policies play critical roles in determining inflation dynamics within the European Union. The significant positive impact of government deficits on inflation underscores the need for

Table 6. Empirical results (fixed effect model)

Variable	Model 1	Model 2	Model 3
C	4.263*** (0.062)	4.578*** (0.010)	3.917*** (0.069)
WAGE	0.02* (0.002)	0.028*** (0.002)	
UNP	-0.002 (0.001)	-0.001 (0.009)	
CBI	-0.021*** (0.005)	-0.031*** (0.007)	
EXR	0.119 (0.014)	0.014*** (0.016)	
TRADE	-0.005*** (0.002)		-0.009*** (0.002)
DEF	0.012* (0.003)		0.013*** (0.004)
TAXR	-0.043*** (0.006)		-0.066*** (0.006)
GGFC	-0.008** (0.003)		-0.005 (0.004)
DEB	0.01* (0.005)		0.034*** (0.006)
EMU	-0.008** (0.003)		
ESDS	-0.005 (0.004)		
Observations	351	275	312
Number of countries	27	27	27
Hausman test	0.0000	0.0000	0.0000

Standard errors in parentheses
denote statistical significance*** p<0.01, ** p<0.05, * p<0.1

fiscal discipline, while the results for monetary policy variables highlight the importance of a proactive central bank in managing inflation expectations. These results suggest that coherent and coordinated policy actions between fiscal and monetary authorities are essential to achieving sustained inflation reduction. The interaction between fiscal expansion and monetary tightening, if not properly aligned, could undermine efforts to stabilize inflation. Therefore, future policy recommendations should emphasize the importance of maintaining fiscal restraint during periods of monetary tightening and ensuring that both policy domains are working toward the common goal of price stability. This coherence between fiscal and monetary policy is essential to maintaining long-term

macroeconomic stability and preventing inflationary pressures from derailing economic growth in the European Union.

Conclusion

in conclusion, this study illuminates the crucial interplay between fiscal and monetary policies in managing inflation dynamics within the European Union (EU) across the period from 2010 to 2023. The analysis reveals how various fiscal and monetary determinants interact to shape inflation outcomes, emphasizing the necessity for coherence between these two policy domains to foster sustainable economic growth and price stability.

The results indicate that government deficits have a significant positive relationship with inflation. Persistent fiscal deficits can lead to increased aggregate demand, which, if not matched by corresponding increases in productive capacity, can contribute to rising prices. As the EU continues to grapple with the economic impacts of global challenges, including the COVID-19 pandemic and geopolitical tensions, maintaining fiscal discipline becomes imperative. Policymakers must prioritize balanced budgets and prudent fiscal management to mitigate the risk of inflationary spirals resulting from unchecked public spending. In this regard, stricter fiscal rules, such as limiting budget deficits to a predefined threshold, could serve as a safeguard against inflationary risks while ensuring long-term debt sustainability.

Furthermore, the negative relationship between unemployment and inflation underscores the traditional Phillips Curve dynamics observed in the study. A rise in unemployment corresponds to a decrease in inflation, suggesting that labor market conditions play a critical role in shaping inflation expectations. Consequently, fiscal policies aimed at maintaining employment levels, such as targeted job creation programs and investment in workforce development, are essential for stabilizing inflation. These measures can help ensure that the economy operates at or near its potential output, reducing the inflationary pressures that often accompany low unemployment rates.

Wage growth emerges as another vital determinant of inflation, with positive coefficients indicating that rising wages can contribute to increased inflationary pressures. To manage this dynamic, fiscal authorities must adopt policies that support wage growth while simultaneously addressing productivity enhancements. In this context, coordinated efforts between fiscal and monetary policies can ensure that wage increases do not lead to unsustainable inflation levels. The European Central Bank (ECB) could consider wage growth as a factor in setting interest rates, particularly in economies where rising wages are not accompanied by proportional productivity gains. Fiscal measures that promote education and skills training can enhance productivity, helping to offset the inflationary impact of rising wages.

The role of central bank interest rates in the inflationary process cannot be overlooked. The positive and significant relationship observed suggests that changes in central bank rates influence inflation dynamics, potentially reflecting the transmission lags associated with monetary policy. Higher interest rates, while initially increasing borrowing costs and production expenses, ultimately serve to curb inflation by reducing demand. This underscores the necessity for a synchronized approach between fiscal expansion and monetary tightening. If fiscal authorities pursue expansionary policies

concurrently with the central bank's efforts to combat inflation through higher interest rates, the effectiveness of these measures may be compromised, leading to conflicting outcomes. Policymakers should carefully calibrate these policies to ensure that fiscal stimuli do not counteract the disinflationary effects of monetary tightening.

Inflation targeting strategies may also differ between old and new EU member states due to structural economic disparities. While older member states often have more established financial institutions and inflation control mechanisms, newer members may experience higher inflation volatility due to ongoing economic transitions. A differentiated approach to inflation targeting, with greater flexibility in policy responses for newer members, could enhance the effectiveness of monetary interventions. Additionally, fiscal policies should be designed to mitigate the adverse effects of external shocks, such as oil price fluctuations or geopolitical disruptions. Automatic stabilizers, such as flexible tax policies or countercyclical spending measures, could help cushion the impact of such shocks on inflation and overall economic stability.

Moreover, the findings related to the euro-dollar exchange rate indicate the importance of external factors in the inflationary process. A weaker euro correlates with rising inflation, highlighting the pass-through effects of exchange rates on domestic price levels. As global economic dynamics evolve, EU policymakers must remain vigilant to external influences and their potential impacts on inflation. Strengthening the resilience of the EU economy to external shocks through diversified energy sources, strategic trade policies, and enhanced monetary coordination could contribute to greater price stability.

Ultimately, this study reinforces the notion that effective management of inflation within the EU requires a holistic approach that integrates fiscal responsibility, proactive monetary measures, and consideration of external economic factors. By fostering coherence between these domains, policymakers can enhance the effectiveness of their strategies, ensuring that both fiscal and monetary policies work in tandem toward the shared goal of price stability and sustainable economic growth.

However, it is crucial to acknowledge the limitations of this study, which primarily focuses on a specific time frame and region. Future research could delve into the nuanced interactions of inflation with additional external factors, providing a more comprehensive understanding. The study also calls for exploration into a broader time frame and diverse countries to enhance the generalizability of findings. Additionally, continuous investigation into the effectiveness of specific monetary and fiscal policy instruments over an extended period could contribute to a more nuanced understanding of their impact on inflation. Examining the evolving role of digital currencies, financial innovations, and global supply chain disruptions in shaping inflationary trends could further enrich policy discussions in the EU and beyond.

References

Alfaro, L. (2005): Inflation, Openness, and Exchange-rate Regimes: The Quest for Short-term Commitment. *Journal of Development Economics*, 77: 229-249.

Arellano, M. — Bond, S. (1991): Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58(2): 277-297.

Arellano, M. — Bover, O. (1995): Another Look at the Instrumental Variables Estimation of Error Components Models. *Journal of Econometrics*, 68(1): 29-51.

Auerbach, A. J. — Gorodnichenko, Y. (2013): Fiscal Multipliers in Recession and Expansion. In: Alesina, A. — Giavazzi, F. (eds): *Fiscal Policy after the Financial Crisis*. Chicago: University of Chicago Press, pp. 18-24.

Baek, J. (2016): A New Look at the FDI–Income–Energy–Environment Nexus: Dynamic Panel Data Analysis of ASEAN. *Energy Policy*, 91: 22-27.

Ball, L. — Mankiw, N. G. (2002): The NAIRU in Theory and Practice. *Journal of Economic Perspectives*, 16(4): 115-136.

Barro, R. J. (1979): On the Determination of the Public Debt. *Journal of Political Economy*, 87(5): 940-971.

Belke, A. — Gros, D. (2015): Fiscal Policy and Inflation in the EU: A Panel Vector Autoregression Analysis. *Journal of International Money and Finance*, 59: 49-76.

Berger, H. — Hefeker, C. (2019): Fiscal Decentralization and Inflation Volatility in the Euro Area. *Economics Letters*, 182: 108503.

Bhat, R. — Sharma, K. (2020): Government Spending and Economic Growth: A Literature Review. *Economic Journal of Development Issues*, 21(1-2): 1-14.

Binici, M. — Centorrino, S. — Cevik, S. — Gwon, G. (2022): Here Comes the Change: The Role of Global and Domestic Factors in Post-Pandemic Inflation in Europe. *IMF Working Paper* No. 2022/241.

Blanchard, O. J. — Katz, L. F. (1999): Wage Dynamics: A Structural Perspective. *Brookings Papers on Economic Activity*, 1999(1): 1-75.

Blundell, R. — Bond, S. (1998): Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87(1): 115-143.

Bošković, O, Popović, S – Njegovan N.(2013):Convergence Process in EMU 12." *Ekonomske teme* 51.2 (2013): 235-250.

Campa, J. M. — Goldberg, L. S. (2005): Exchange Rate Pass-Through into Import Prices. *The Review of Economics and Statistics*, 87(4): 679-690.

Catao, L. A. V. — Terrones, M. E. (2005): Fiscal Deficits and Inflation. *Journal of Monetary Economics*, 52: 529-554.

Chrigui, Z. — Boujelbene, Y. — Mhamdi, G. (2011): Central Bank Independence and Inflation: Evidence from Emerging Countries. *Journal of Policy Modeling*, 33: 453-469.

Cochrane, J. (2023): *The Fiscal Theory of the Price Level*. Princeton, NJ: Princeton University Press.

Curwen, P. (1976): Government Expenditure and Inflation. *Journal of Public Economics*, 6(2): 241-253.

Gagnon, J. E. — Ihrig, J. (2004): Monetary Policy and Exchange Rate Pass-Through. *International Journal of Finance and Economics*, 9(4): 315-338.

Georgantopoulos, A. — Tsamis, A. (2010): The Interrelationship Between Money Supply, Prices and Government Expenditures and Economic Growth: A Causality Analysis for the Case of Cyprus. *International Journal of Economic Sciences and Applied Research*, 5(3): 115-128.

Ghosh, A. R. — Gulde, A.-M. — Ostry, J. D. — Wolf, H. (1997): Does the Exchange Rate Regime Matter for Inflation and Growth? In: Blejer, M. I. — Škreb, M. (eds): *Exchange Rate Regimes: Choices*

and Consequences. Washington D.C.: International Monetary Fund, pp. 203-238.

Gordon, R. J. (1997): The Time-Varying NAIRU and Its Implications for Economic Policy. *Journal of Economic Perspectives*, 11(1): 11-32.

Greene, W. H. (2008): *Econometric Analysis*. 6th ed., Upper Saddle River, New Jersey: Prentice-Hall.

Gul, H. — Mughal, K. — Rahim, S. (2012): Linkage Between Monetary Instruments and Economic Growth. *Universal Journal of Management and Social Sciences*, 2(3): 69-76.

International Monetary Fund (2022): *Fiscal Monitor*. Washington D.C.: International Monetary Fund.

Janssen, N. — Nolan, C. — Thomas, R. (2003): Money, Debt and Prices in the United Kingdom, 1705–1996. *Economica*, 69: 461-479.

Ješić, M. (2016): Uloga fiskalnog agenta u uspešnosti monetarnog režima targetiranja inflacije. *Ekonomske ideje i praksa*, 21: 77-99.

Kjosevski, J., Petkovski, M., Jovanovski, K. (2021). Macro and bank specific determinants of non-performing loans in Polish commercial banks. *Argumenta Oeconomica* Vol 2, issue 47 :107-127

Komazec, S. — Ristić, Ž. (1992): *Монетарна и фискална стратегија*. Београд: Институт за финансије и развој.

Kwon, G. — McFarlane, L. — Robinson, W. (2006): Public Debt, Money Supply, and Inflation: A Cross-Country Study and Its Application to Jamaica. *IMF Working Paper* No. WP/06/121.

Maddala, G.S. - Wu, S. (1999) A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. Oxford Bulletin of Economics and Statistics, 61, 631-652. http://dx.doi.org/10.1111/1468-0084.61.s1.13

Kvrgić, G., Čolić, Z., - Vujović, T. (2011): Značaj koordinacije mera monetarne i fiskalne politike. *Bankarstvo,* 40(3-4), 32-61.

Mohseni-Cheraghlou, A. — Rault, C. (2019): Monetary and Fiscal Policy and Inflation in Emerging and Developing Countries. *Emerging Markets Finance and Trade*, 55: 2499-2520.

Nguyen, V. B. (2015): Effects of Fiscal Deficit and Money M2 Supply on Inflation: Evidence from Selected Economies of Asia. *Journal of Economics, Finance and Administrative Science*, 20(38): 49-53.

Olayungbo, D. O. (2013): Government Spending and Inflation in Nigeria: An Asymmetry Causality Test. *International Journal of Humanities and Management Sciences*, 1: 1-10.

Petkovski M, Kjosevski J, Simeonovski K (2022) : Testing for Causality between Remittances and Inflation: Evidence from Central and Eastern Europe. *Panoeconomicus*, 1-25. doi:10.2298/PAN210322019P

Petkovski, M. — Kjosevski, J. — Stojkov, A. — Popovska-Kamnar, B. (2023): Bank Profitability and Economic Growth: Evidence from Central and Eastern Europe. *Finance a úvěr-Czech Journal of Economics and Finance*, 73(3): 1-15.

Petkovski, M.- Stojkov, A.- Kjosevski, J.(2023). Investigating the Factors Influencing Shadow Banking in the EU Member States. *Eastern European Economics.* 251–273 https://doi.org/10.1080/00128775.2023.2215217

Rakić, B. — Radjenović, T. (2013): The Effectiveness of Monetary and Fiscal Policy in Serbia. *Industrija*, 41: 103-122.

Reinhart, C. M. — Rogoff, K. S. (2010): Growth in a Time of Debt. *American Economic Review*, 100(2): 573-578.

Roodman, D. (2007): A Short Note on the Theme of Too Many Instruments. *Center for Global Development Working Paper* No. 125.

Roodman, D. (2009): How to do Xtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal*, 9(1): 86-136.

Sargent, T. J. — Wallace, N. (1981): Some Unpleasant Monetarist Arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review*, 5(3): 1-17.

Taylor, J. B. (1993): Discretion versus Policy Rules in Practice. *Carnegie-Rochester Conference Series on Public Policy*, 39: 195-214.

Taylor, J. B. (2000): Low Inflation, Pass-Through, and the Pricing Power of Firms. *Economic Policy Review*, 6(3): 1-17.

Teixeira, A. — Queirós, A. (2016): Economic Growth, Human Capital and Structural Change: A Dynamic Panel Data Analysis. *Research Policy*, 45: 418-431.

Tressel, T. — Prati, A. (2006): Public Spending, Growth, and Inflation: An Empirical Investigation. *IMF Working Paper* No. WP/06/240.

Wooldridge, J. M. (2002): *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Zubair, M. — Yeldan, A. E. (2022): Monetary and Fiscal Interactions in Inflationary Dynamics: An Emerging Market Perspective. *Journal of Economic Policy Reform*, 25: 227-243.