EFFECTS OF FISCAL AND MONETARY POLICIES ON INFLATION AMONG EUROZONE COUNTRIES

April 2023

Research Division

Mareks Mateušs

Website | **Newsletter** | **Instagram** | LinkedIn

EFFECTS OF FISCAL AND MONETARY POLICIES ON INFLATION AMONG EUROZONE COUNTRIES

Mareks Mateušs

Abstract

This paper aims to investigate whether there are notable variations in inflation behavior and the efficacy of fiscal and monetary policies across different countries in the eurozone. The study indicates that monetary policy is more influential in controlling inflation than fiscal policies. Additionally, there is no discernible pattern in the impact of these policies based on geographical location or the order of countries joining the monetary union. The findings remain consistent across various tests using different fiscal policy variables.

TABLE OF CONTENTS

1 INTRODUCTION

It is well known that both the budget deficit and low-interest rates contribute to higher inflation. These two tools should be synchronized to effectively control the price change rate and not disrupt economic growth (Fischer & Easterly, 1990). There are at least two difficulties that prevent synchronizing these two policies most effectively. The first complication lies in the fact that fiscal and monetary policies are performed by two different authorities. Consequently, the coordination problem that arises from the communication between two institutions is transmitted to the broader economy in form of the loss of control over inflation (Andersen & Schneider, 1986). The second problem is that the interest rate set by the central bank is applied to a broader geographic area than the local budget approved by the state council or municipality (Badarau & Levieuge, 2013). Therefore, inflation reacts not only to changes in the interest rate set by the central monetary authority but also to changes in fiscal policies of member countries. The central question of this paper is whether there are significant geographic differences between countries within one monetary area apart from the level of a budget deficit that shapes inflation behavior. This question is examined using data from 17 eurozone countries.

The simple model shows that (i) fiscal policies are less powerful in controlling inflation than the monetary policy, (ii) there is no specific pattern by which the magnitude of the effect of two policies may dependent on geographical allocation or by the order by which countries entered the monetary union, (iii) the results are robust to the alternative tests using different variables for fiscal policy.

The rest of the paper is structured as follows. Section 2 presents the literature review on the topic, Section 3 introduces the methodology used in the empirical analysis, Section 4 presents the results of the analysis, and Section 5 concludes.

2 LITERATURE REVIEW

The first approach to describe the relationship between the budget deficit and inflation was taken by Blinder and Solow (1973) who, using simple Keynesian economic insights, raise the question of the spillover effect of government spending on interest rates and price changes. The next leap in a theoretical strand of the literature was done by Sargent and Wallace (1981) who develop the idea of monetizing the government debt by lowering interest rates and providing access to capital. This, in turn, leads to a higher money supply, more dynamic economic activity, and higher inflation. Scholars at that time period already noted that the relationship between the level of the budget deficit and inflation is not strictly linear.

Jesse (1974) found that as the U.S. budget deficit rose in years between 1945 and 1973, the inflation rate increased, in turn in years with budget surplus prices rose at a slower rate but no deflation was recorded in this time period though there were several years with a budget surplus over $10 billion. Of the special interest for this paper is the model and empirical study done by Ferrero (2009) who proposes fiscal and monetary rules for a single monetary union.

The extensive empirical literature is devoted to studies of the relationship between budget structure and inflation in specific countries. Metin (1998) studies this relationship for Turkey and finds a positive relationship. Several other studies focus on developing economies (Oladipo & Akinbobola, 2011; Solomon & De Wet, 2004; Tiwari & Tiwari, 2011), the majority of them finding a significant impact of the deficit on inflation but not the other way around. Habibullah et al. (2011) and Nguyen (2015) study the relationship between the budget deficit and inflation, controlling for various monetary policy variables, in Asian countries in total covering the time period from 1950 to 2012. All three statistical methods used in these studies show that the budget deficit causes inflation in the long run. Changes in money supply have a significant effect in two of the three methods used, in turn, two methods demonstrate that interest rate changes have at least as significant an effect on inflation as fiscal policy. Only in three out of 13 countries budget deficit Granger cause inflation in the short run. A noticeable distinction between these two studies, apart from the time horizon covered, is that the former treats the selection of countries as one sample, while the latter estimates regression for each country separately. Only for Taiwan and Indonesia an estimated lagged money supply coefficient has a negative sign; the variation of the estimated direction of the effect of budget deficit on inflation is greater. Regarding European countries, Miklós-Somogyi and Balogh (2009) and Vieira (2000) can be distinguished. However, what one study lacks is the other's advantage. Namely, Miklós-Somogyi and Balogh study the relationship between budget deficit and inflation in a sample of 27 EU countries but for a relatively short period of time, only from 1999 to 2007. In turn, a study performed by Vieira captures a longer period – from 1950 to 1996 – but includes only six EU countries. Both authors find weak proof of the causality of inflation by the budget deficit. Finally, an extensive study was done by Catão and Terrones (2005) who analyze the deficit-inflation relationship among 107 countries for the 1960-2001 period. Their primary finding is that the positive relationship is stronger in developing countries than in developed ones. They find no evidence that budget deficit causes inflation in low-inflation countries, but it does in countries with a moderate inflation rate. Authors do not control for interest rates in their regression but include a narrow money variable and its effect tends to vary over time across developed economies but diminish in developing

economies. Their findings are supported by the work of Lin and Chu (2013) based on a sample of 91 economies from 1960 to 2006 and by the use of different statistical models.

3 METHODOLOGY AND DATA

For the analysis of the question at hand, this paper uses the data from 2001 to 2021 for 17 eurozone countries as of 2022. The data set consists of annual deposit rates[1] set by the European Central Bank (ECB), the annual budget balance of every country, and annual inflation rates throughout the period. A detailed description of the data set can be found in Appendix A.

It does not seem that any of the time series variables included in this model would exhibit an alarming degree of autocorrelation. Table B1 summarizes the results of AR(1) regressions that were run in respect to each of the variables used in this model. Only for a minority of countries lagged values of budget balance and inflation are perfect estimates for future values of corresponding variables; in case of the deposit rate, this is true for all countries of the sample. However, the variation in the previous values of all three variables poorly explains the variation in their future values – this is evident from the R-squared values. In case of severe autocorrelation R-squared value is usually close to one, while here it varies from close zero to 0.67 in case of inflation, from 0.01 to 0.67 for budget balance, and 0.7 for the deposit rate. This is enough to state that variable here do not exhibit serial correlation.

To formally approve that intermediate conclusion, I use the Augmented Dickey-Fuller (ADF) test. To choose an appropriate specification of the ADF test, it is first necessary to determine the degree of time dependence of every variable over which the test is run. Figure B1 shows time series plots of each of four variables included in this analysis for each country from the data set. For almost half of the sample of countries the time dependence of inflation variable seems the most notable; these countries are Greece, Ireland, Italy, Netherlands, Portugal, Slovakia, Slovenia, and Spain. Similarly, in case of budget balance variable these are Belgium, Estonia, Finland, France, Germany, and Spain. The pattern in behavior of time series can be found almost for all countries in case of tax variable. Therefore, ADF tests are run with different specifications for different selection of countries for different variables. For Belgium, Estonia, Finland, France, Germany, and Spain the ADF test on budget balance variable is run with trend and intercept specification and 2 lags (referred to as Specification 1 further in the text); for the rest, only intercept specification is applied (referred to as

[1] The calculation of yearly rates for each country for deposit rates changing non-regularly are shows in the appendix.

Specification 2 further in the text). For Greece, Ireland, Italy, Netherlands, Portugal, Slovakia, Slovenia, and Spain the ADF test on inflation variable is run with trend and intercept specification and 2 lags; for the rest, only intercept specification is applied. The ADF tests on the deposit facility rate and tax on personal income variables are run with trend and intercept specification and 2 lags for all countries. The outcome of the ADF test is presented in Table B2.

The null is not rejected for all countries with Specification 1 in the ADF test on budget balance variable; among those countries of Specification 2, it is rejected only for Italy, Luxembourg, Slovakia, and Slovenia. Hence, the budget balance variable is included in its original form only in regressions for Italy, Luxembourg, Slovakia, and Slovenia. The variable is included in its difference form for the rest of the countries.

The null is rejected only for Italy and Netherlands among countries with Specification 1 in the ADF test on inflation. Among those countries within Specification 2, the null is not rejected only for Latvia and Lithuania. Hence, the inflation variable is included in its difference form only for Latvia and Lithuania among those countries within Specification 2 group. In case of Italy and Netherlands, in case of rejection of the null, it is most suitable to de-trend the inflation variable by including time trend. However, since it is the only variable among four with the deterministic trend for these two countries, we proceed with alternative option of transforming the variable into stationary – include it in the difference form. The null is not rejected in case of the ADF test on deposit facility rate, hence it is included in its difference form in every regression.

For the ADF test on tax on personal income variable, the null is rejected only in case of Germany and Spain, but similar as with Italy and Netherlands in case of the ADF test on inflation variable, the tax variable is included in differenced form in regressions for Germany and Spain. Based on the output of the ADF test, the final set of the regression equations is:

TABLE 1. REGRESSION EQUATIONS WITH BUDGET BALANCE AS FISCAL VARIABLE

$\Delta inflation_t = \beta_0 + \beta_1 \Delta budget_t + \beta_2 \Delta interest_t$	Greece, Ireland, Latvia, Lithuania, Netherlands, Portugal, Spain	(1)
$inflation_t = \beta_0 + \beta_1 \Delta budget_t + \beta_2 \Delta interest_t$	Belgium, Estonia, Finland, France, Germany	(2)
$\Delta inflation_t = \beta_0 + \beta_1 budget_t + \beta_2 \Delta interest_t$	Italy, Slovakia, Slovenia	(3)
$inflation_t = \beta_0 + \beta_1 budget_t + \beta_2 \Delta interest_t$	Austria, Luxembourg	(4)

where $budget_t$ is the budget balance in year t, $\Delta budget_t$ is the differenced budget balance variable that equals the difference between the budget balance in year $t-1$ and t, $\Delta interest_t$ is the differenced deposit facility rate variable that equals the difference between the deposit facility rate in year $t-1$ and t. The output of this set of equations is supposed to show the effect of the change in budget balance and deposit facility rate on the change in inflation level. In this study, only the short-run effect is estimated for several reasons. First, the amount of data used in this paper suffices to estimate short-run effects but is not enough for predicting the long-run impact of two variables on inflation. Second, having found that both inflation and budget balance variables are stationary suggests that there may be a weak and thus problematically captured long-run relationship between these two variables.

For an additional check of the influence of the fiscal policy in terms of budget balance on inflation, I use tax on personal income variable instead of budget balance variable in running a second regression. The time series plots of taxes for each country suggest that this variable is strongly time dependent for the majority of the countries. Therefore, the ADF test with Specification 1 is run for each country. The output of these tests is seen in column 5 of Table B2. The null is rejected only in case of Spain and Germany. Hence, the alternative set of regression equations looks as follows:

TABLE 2. REGRESSION EQUATIONS WITH TAX ON PERSONAL INCOME AS FISCAL VARIABLE

$inflation_t = \beta_0 + \beta_1 \Delta tax_t + \beta_2 \Delta interest_t$	Austria, Belgium, Estonia, Finland, France, Germany, Luxembourg	(5)
$\Delta inflation_t = \beta_0 + \beta_1 \Delta tax_t + \beta_2 \Delta interest_t$	Greece, Latvia, Lithuania, Ireland, Italy, Netherlands, Portugal, Slovakia, Slovenia, Spain	(6)

The output of both sets of regression models is discussed in the following section.

4 RESULTS

Table B3 presents the results of series of regressions outlined in previous chapter. From the regressions with the use of budget balance as fiscal policy variable, in 11 of 17 countries, the deposit facility rate turns out significant at at least 10 percent level, while in only four regressions the budget balance coefficient is significant. The variation in these two variables explain the variation in inflation in 17.8 to 63 percent of the cases (with 17.8 percent

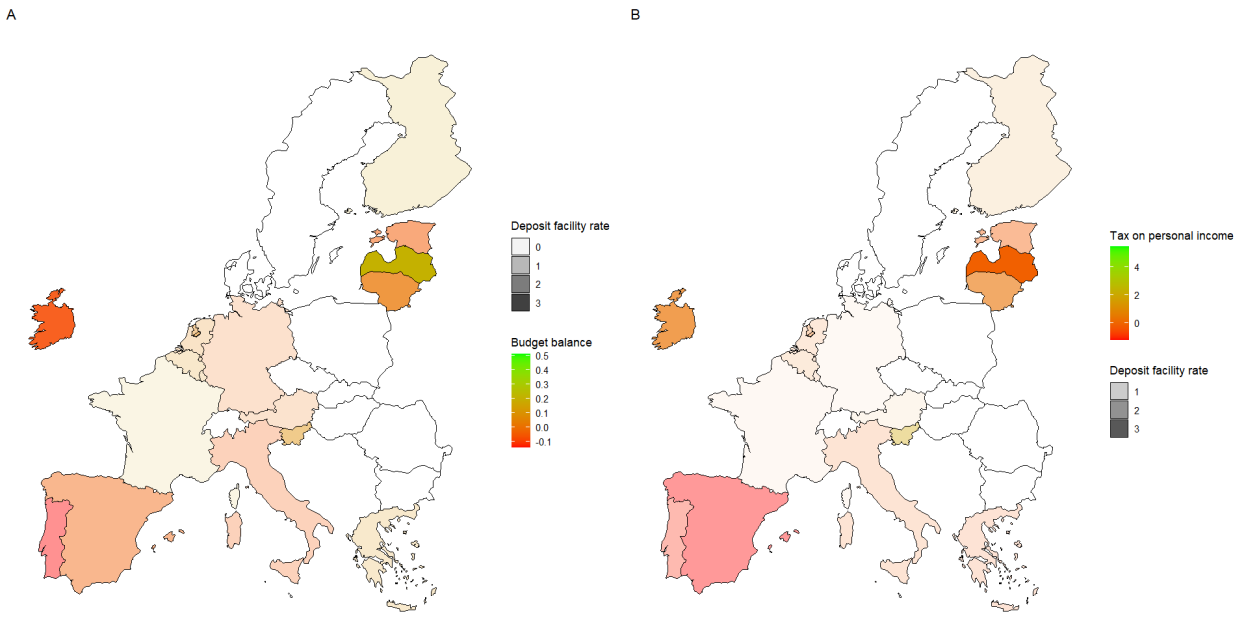
in case of Greece and 63 percent in regression of Ireland). Most regressions, however, yield a relatively low predictive power, with 10 regressions resulting in R-squared less than 0.3.

Somewhat worse in terms of significance of coefficients performs the second portion of regressions. Here, only eight regressions yield a significant deposit facility rate coefficient, and one yields a significant tax on personal income coefficient. As expected, the predictive power of this series of regressions decreased to R-squares of 10 regressions being below 0.3. This indicates that the tax rate is worse estimate in predicting the effect of the fiscal policy on inflation than the budget balance.

Figure 1 depicts the estimated coefficients for each country in both groups of regressions. Several observations can be made. First, the overall significance of tax on personal income is lower, especially for those countries located in Central Europe (panel B). The significance of a budget balance variable is higher (panel A). Second, the magnitude of the effect of the change in tax on personal income on the change in inflation is greater than such in case of a budget balance variable. Third, Baltic states, Ireland, and southwest of Europe can be distinguished as countries with the relatively higher impact of budget balance and deposit facility rate combined on the inflation. Such effect in Central European countries is moderate. Finally, it is not clear if there is an overall pattern of switching the degree to which inflation is affected by changes in fiscal and monetary policy. Ideally, we would like to observe, e.g., green light on the West and red dark on the East, or similar pattern.

Alternatively, to see if there is relationship between the values of coefficients from two sets of equations and different characteristics of countries, I plot the order by which countries entered the eurozone against their values of coefficients. Figure 2 illustrates this relationship for both sets of equations. Panels A and B refer to the first set of regressions (1-4) with budget balance serving as an estimate of fiscal policy. Panel C and D refer to the second set of regressions (5-6). There is a positive relationship between the order by which countries enter the monetary union and all three variables used for both set of equations. Interestingly, the values of coefficients of deposit facility rate are allocated proportionally in both set of regressions but this is not the case for budget balance and tax on personal income coefficients. The argument that can be made from observing this relationship is that the latest countries joined to the monetary union are more impacted by conducting the united monetary policy than those who joined in earlier.

FIGURE 1. REGRESSION COEFFICIENTS BY COUNTRY

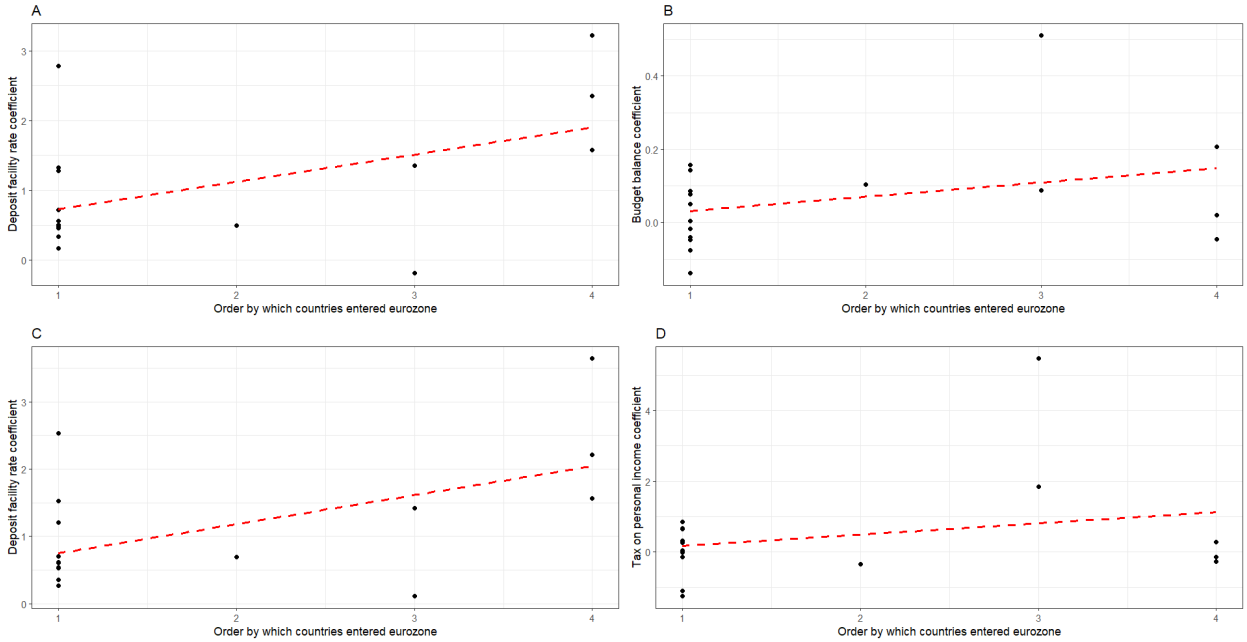


Note: the color from red to green indicates the estimated coefficient of the budget balance variable (panel A) and tax on personal income (panel B) for a particular country, where red indicates more a lower coefficient and green indicates a higher coefficient. The darkness of the color indicates the estimated coefficient of the deposit facility rate coefficient, where the lighter is the color the lower is the estimated coefficient. Panel A visualizes the values of corresponding coefficients of the first set of regression equations (1-4) and Panel B visualizes such of the second set of regression equations (5-6).

5 CONCLUSION

This study is supposed to show empirically if there is a dominance of either monetary or fiscal policies in terms of their impact of inflation level with the example of 17 eurozone countries. Previous studies showed that the fiscal policy is relatively weak in shaping inflation level in developed countries than in developing countries. In turn, monetary policy is more powerful for that task. The present study demonstrates that overall, among the selected countries, budget balance changes indeed do not have a significant effect on inflation, but monetary policy does for the majority of countries although to different extent. This finding is robust for the use of alternative variable of the fiscal policy – tax rate on personal income. Moreover, there is no clear geographic pattern by which the dominance of one of these effects is greater than the other depending on the geographical allocation of country. However, we do observe some similarities in these effects by regions and the order by which countries entered the eurozone.

FIGURE 2. RELATIONSHIP BETWEEN ORDER OF ENTERING EUROZONE AND FISCAL AND MONETARY VARIABLE COEFFICIENTS



Note: the dots represent countries that match the order by which each of them joined the eurozone and corresponding value of the coefficient. The red dashed line represents the least squares regression line.

Further research could be done based on these findings. For instance, one can study the relationship between the size of economies and the degree to which inflation is affected by fiscal and monetary policies. If there turns out to appear a certain trend within one monetary union, it is a way to develop a theoretical framework for explaining such trend and being able to predict general tendency for countries' inflation levels to be affected by fiscal and monetary policy to different extents.

REFERENCES

Andersen, T. M., & Schneider, F. (1986). Coordination of fiscal and monetary policy under different institutional arrangements. *European Journal of Political Economy*, *2*(2), 169-191. https://doi.org/ /10.1016/0176-2680(86)90002-9

Badarau, C., & Levieuge, G. (2013). Financial Heterogeneity in a Monetary Union. *Journal of Economic Integration*, *28*(3), 482-506. http://www.jstor.org/stable/41959046

Blinder, A. S., & Solow, R. M. (1973). Does fiscal policy matter? *Journal of public economics*, *2*(4), 319-337.

Catão, L. A. V., & Terrones, M. E. (2005). Fiscal deficits and inflation. *Journal of Monetary Economics*, *52*(3), 529-554. https://doi.org/10.1016/j.jmoneco.2004.06.003

Ferrero, A. (2009). Fiscal and monetary rules for a currency union. *Journal of international Economics*, *77*(1), 1-10.

Fischer, S., & Easterly, W. (1990). The economics of the government budget constraint. *The World Bank Research Observer*, *5*(2), 127-142.

Habibullah, M. S., Cheah, C.-K., & Baharom, A. (2011). Budget deficits and inflation in thirteen Asian developing countries. *International Journal of Business and Social Science*, *2*(9).

Jesse, L. (1974). Budget deficits and inflation. *Financial Analysts Journal*, *30*(4), 44-47. http://www.jstor.org/stable/4529717

Lin, H.-Y., & Chu, H.-P. (2013). Are fiscal deficits inflationary? *Journal of International Money and Finance*, *32*, 214-233. https://doi.org/10.1016/j.jimonfin.2012.04.006

Metin, K. (1998). The relationship between inflation and the budget deficit in Turkey. *Journal of Business & Economic Statistics*, *16*(4), 412-422.

Miklós-Somogyi, P., & Balogh, L. (2009). *The relationship between public balance and inflation in Europe*. BERG Working paper series on government and growth.

Nguyen, 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*, 49-53.

Oladipo, S., & Akinbobola, T. O. (2011). Budget deficit and inflation in Nigeria: A causal relationship. *Journal of emerging trends in economics and management sciences*, *2*(1), 1-8.

Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Federal reserve bank of minneapolis quarterly review*, *5*(3), 1-17.

Smeekes, S., & Wilms, I. (2020). bootUR: Bootstrap Unit Root Tests.

Solomon, M., & De Wet, W. A. (2004). The effect of a budget deficit on inflation: The case of Tanzania. *South African Journal of Economic and Management Sciences*, *7*(1), 100-116.

Tiwari, A. K., & Tiwari, A. (2011). Fiscal Deficit and Inflation: An empirical analysis for India. *Romanian Economic Journal*, *14*(42).

Vieira, C. (2000). Are fiscal deficits inflationary? Evidence for the EU. *Economic Research Paper*, *7*, 1-16.

APPENDIX A

The data set contains a selection of variables of following countries: Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Portugal, Slovakia, Slovenia, Spain.

The variables used are:

- Inflation, consumer prices (annual %). Retrieved from the World Development Indicators for each country separately (series code: FP.CPI.TOTL.ZG) on April 15, 2023.
- Budget deficit (% of nominal GDP). Retrieved from https://countryeconomy.com/deficit for each country separately on April 15, 2023.
- Deposit facility rate (% per annum). Retrieved from the ECB data warehouse from https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=143.FM.B.U2.EUR.4F.KR.DFR.LEV on April 15, 2023. Irregularly changed interest rates are not suitable for including in the regression since different rates are effective for different time periods within a year. Therefore, the following transformation is made to find the approximate value of the rate of the interest that is expressed in form of an annual percentage:

$$interest_t = \sum_{i=1}^{n} \left(1 + \frac{interest_{t,i}}{100}\right)^{\frac{date_{t,i} - date_{t,i-1}}{365}} - 1$$

where $interest_t$ is the deposit facility rate expressed in form of an annual percentage, $interest_{t,i}$ is the deposit facility rate set by the ECB Governing Council on the ith meeting of year t, $date_{t,i}$ is the date of the ith meeting of the year t when the deposit facility rate was changed by the ECB Governing Council. To account for the period between the last change of the rate in a year and the end of the year, as the last observation in a given year, I include 31 December which corresponds to the last rate set by the ECB Governing Council during a given year.

- Tax on personal income (% of GDP). Retrieved from the OECD Library from doi:10.1787/94af18d7-en on April 15, 2023.

APPENDIX B

TABLE B1. AR(1) MODELS

Country	Inflation		Budget balance		Deposit facility rate		Tax on personal income	
	Estimate	R^2	Estimate	R^2	Estimate	R^2	Estimate	R^2
Austria	0.019 (0.236)	0.000	0.291 (0.238)	0.072	0.801*** (0.120)	0.700	0.361 (0.217)	0.127
Belgium	-0.050 (0.228)	0.0025	0.513** (0.203)	0.251	0.801*** (0.120)	0.700	0.885*** (0.108)	0.780
Estonia	0.2310 (0.224)	0.052	0.427* (0.218)	0.168	0.801*** (0.120)	0.700	0.726*** (0.157)	0.529
Finland	0.2970 (0.210)	0.095	0.744* (0.126)	0.647	0.801*** (0.120)	0.700	0.648*** (0.121)	0.602
France	0.2750 (0.220)	0.076	0.525** (0.193)	0.280	0.801*** (0.120)	0.700	1.01*** (0.090)	0.868
Germany	0.004 (0.268)	0.000	0.664*** (0.181)	0.414	0.801*** (0.120)	0.700	0.934*** (0.111)	0.788
Greece	0.705*** (0.159)	0.507	0.582*** (0.185)	0.344	0.801*** (0.120)	0.700	0.824*** (0.136)	0.660
Ireland	0.465** (0.187)	0.246	0.642*** (0.168)	0.435	0.801*** (0.120)	0.700	0.872*** (0.122)	0.728
Italy	0.509** (0.193)	0.268	0.364 (0.242)	0.106	0.801*** (0.120)	0.700	0.845*** (0.110)	0.755
Latvia	0.526** (0.195)	0.277	0.717*** (0.183)	0.446	0.801*** (0.120)	0.700	0.488*** (0.197)	0.244
Lithuania	0.527** (0.198)	0.272	0.503** (0.199)	0.251	0.801*** (0.120)	0.700	0.849*** (0.122)	0.719
Luxembourg	0.304 (0.211)	0.098	0.384* (0.188)	0.181	0.801*** (0.120)	0.700	1.04*** (0.069)	0.922
Netherlands	0.447** (0.208)	0.195	0.577*** (0.178)	0.357	0.801*** (0.120)	0.700	0.848 (0.122)	0.717
Portugal	0.562*** (0.187)	0.323	0.539** (0.194)	0.288	0.801*** (0.120)	0.700	0.868*** (0.121)	0.730
Slovakia	0.477*** (0.142)	0.372	0.448*** (0.143)	0.340	0.801*** (0.120)	0.700	1.03*** (0.103)	0.839
Slovenia	0.712*** (0.144)	0.671	0.349 (0.216)	0.121	0.801*** (0.120)	0.700	0.650*** (0.173)	0.426
Spain	0.454** (0.202)	0.210	0.773*** (0.144)	0.601	0.801*** (0.120)	0.700	0.968*** (0.125)	0.760

Note: the number in parentheses indicates standard error of the coefficient. ***, **, and * indicate the significance on 1, 5, and 10 percent level, respectively.

FIGURE B1. TIME SERIES PLOTS OF ORIGINAL VARIABLES

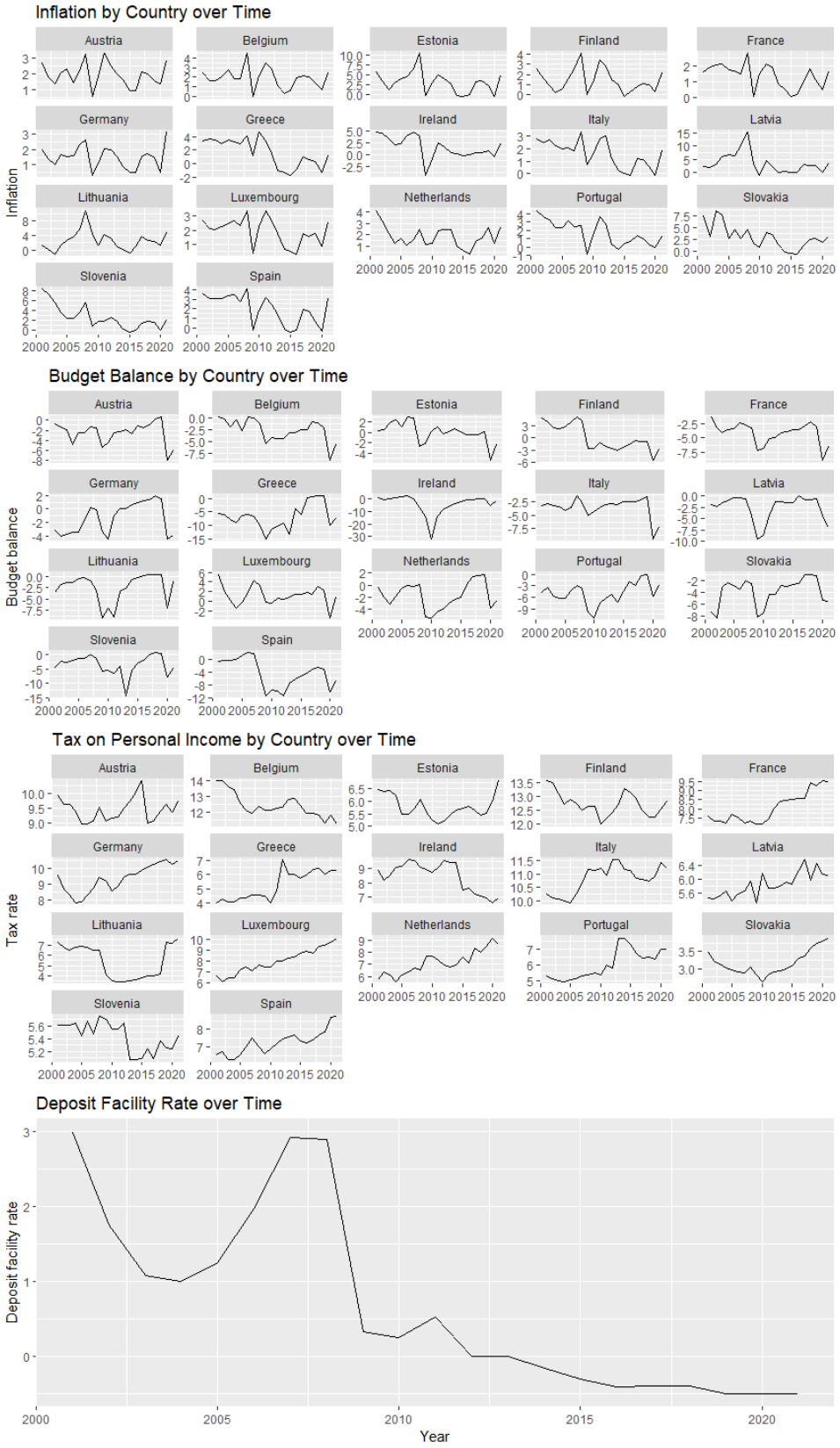


TABLE B2. ADF TESTS

Country	Inflation	Budget balance	Deposit facility rate	Tax on personal income
(1)	(3)	(2)	(4)	(5)
Austria	-4.484 (0.002)	-3.148 (0.038)	-3.004 (0.155)	**-2.651 (0.264)**
Belgium	-4.788 (0.001)	**-3.125 (0.127)**	-3.004 (0.155)	**-2.759 (0.226)**
Estonia	-3.650 (0.013)	**-2.848 (0.198)**	-3.004 (0.155)	**-1.147 (0.894)**
Finland	-3.508 (0.018)	**-2.479 (0.333)**	-3.004 (0.155)	**-1.821 (0.655)**
France	-3.386 (0.024)	**-2.636 (0.269)**	-3.004 (0.155)	**-2.110 (0.509)**
Germany	-3.874 (0.008)	**-2.280 (0.424)**	-3.004 (0.155)	**-3.748 (0.042)**
Greece	**-2.645 (0.266)**	-2.298 (0.181)	-3.004 (0.155)	**-2.844 (0.199)**
Ireland	**-1.634 (0.741)**	-2.105 (0.244)	-3.004 (0.155)	**-1.349 (0.844)**
Italy	**-3.332 (0.089)**	-2.715 (0.088)	-3.004 (0.155)	**-2.224 (0.452)**
Latvia	-2.504 (0.129)	-1.614 (0.457)	-3.004 (0.155)	**-2.720 (0.239)**
Lithuania	-2.473 (0.136)	-2.576 (0.114)	-3.004 (0.155)	**-1.544 (0.778)**
Luxembourg	-3.389 (0.023)	-4.146 (0.004)	-3.004 (0.155)	**-2.202 (0.462)**
Netherlands	**-3.303 (0.094)**	-2.300 (0.1813)	-3.004 (0.155)	**-2.586 (0.289)**
Portugal	**-2.278 (0.425)**	-2.374 (0.160)	-3.004 (0.155)	**-2.235 (0.446)**
Slovakia	**-2.028 (0.551)**	-2.784 (0.078)	-3.004 (0.155)	**-1.161 (0.891)**
Slovenia	**-1.794 (0.669)**	-3.106 (0.042)	-3.004 (0.155)	**-1.929 (0.602)**
Spain	**-3.087 (0.135)**	**-2.035 (0.547)**	-3.004 (0.155)	**-3.715 (0.045)**

Note: the table contains test statistics and the number in parentheses indicates p-values of ADF tests. Numbers in bold indicate countries with Specification 1. The tests were run using the function `adf` within the `bootUR` (Smeekes & Wilms, 2020) package of R software.

TABLE B3. REGRESSION RESULTS

Regression equation	Country	Coefficient	Estimate	R^2
$\Delta inflation_t = \beta_0 + \beta_1 \Delta budget_t + \beta_2 \Delta interest_t$	Greece	β_1	0.103 (0.080)	0.178
		β_2	0.496 (0.495)	
	Ireland	β_1	-0.075* (0.043)	0.628
		β_2	2.776*** (0.504)	
	Latvia	β_1	0.206 (0.258)	0.491
		β_2	3.219*** (1.017)	
	Lithuania	β_1	0.020 (0.139)	0.427
		β_2	2.350*** (0.699)	
	Netherlands	β_1	0.050 (0.087)	0.223
		β_2	0.563* (0.305)	
	Portugal	β_1	-0.138 (0.099)	0.391
		β_2	1.282*** (0.378)	
	Spain	β_1	-0.039 (0.070)	0.310
		β_2	1.325** (0.473)	
$inflation_t = \beta_0 + \beta_1 \Delta budget_t + \beta_2 \Delta interest_t$	Belgium	β_1	0.085 (0.117)	0.189
		β_2	0.505 (0.342)	
	Estonia	β_1	-0.045 (0.314)	0.169
		β_2	1.58* (0.870)	
	Finland	β_1	0.158* (0.083)	0.253
		β_2	0.336 (0.344)	
	France	β_1	0.143* (0.078)	0.213
		β_2	0.168 (0.235)	
	Germany	β_1	-0.017 (0.075	0.200
		β_2	0.477* (0.232)	
$\Delta inflation_t = \beta_0 + \beta_1 budget_t + \beta_2 \Delta tax_t$	Italy	β_1	-0.047 (0.120)	0.222
		β_2	0.716** (0.315)	
	Slovakia	β_1	0.510* (0.280)	0.184
		β_2	-0.188 (0.902)	
	Slovenia	β_1	0.087 (0.080)	0.441
		β_2	1.354*** (0.400)	
$inflation_t = \beta_0 + \beta_1 budge$ $+ \beta_2 \Delta inter$	Austria	β_1	0.003 (0.073)	0.203
		β_2	0.460** (0.220)	
	Luxembourg	β_1	0.076 (0.105)	0.190
		β_2	0.479 (0.290)	
$inflation_t = \beta_0 + \beta_1 \Delta tax_t + \beta_2 \Delta interest_t$	Austria	β_1	0.674 (0.326)	0.357
		β_2	0.357 (0.200)	
	Belgium	β_1	0.318 (0.589)	0.179
		β_2	0.603 (0.317)	
	Estonia	β_1	-0.277 (1.694)	0.170
		β_2	1.564 (0.826)	
	Finland	β_1	0.847 (0.776)	0.160
		β_2	0.544 (0.351)	
	France	β_1	0.258 (0.573)	0.081
		β_2	0.272 (0.247)	
	Germany	β_1	0.648 (0.411)	0.295
		β_2	0.270 (0.235)	
	Luxembourg	β_1	0.051 (0.656)	0.167
		β_2	0.530 (0.297)	
	Greece	β_1	-0.343 (0.557)	0.122
		β_2	0.693 (0.484)	

TABLE B3 (CONTINUED)

$\Delta inflation_t = \beta_0 + \beta_1 \Delta tax_t + \beta_2 \Delta interest_t$	Ireland	β_1	0.305 (0.656)	0.571
		β_2	2.531*** (0.527)	
	Italy	β_1	-0.138 (0.828)	0.217
		β_2	0.708** (0.319)	
	Latvia	β_1	-0.139 (1.903)	0.473
		β_2	3.643*** (0.948)	
	Lithuania	β_1	0.286 (0.590)	0.434
		β_2	2.212*** (0.742)	
	Netherlands	β_1	-0.021 (0.394)	0.209
		β_2	0.622* (0.303)	
	Portugal	β_1	-1.103** (0.470)	0.484
		β_2	1.204*** (0.329)	
	Slovakia	β_1	5.470 (4.525)	0.107
		β_2	0.112 (0.928)	
	Slovenia	β_1	1.844 (1.442)	0.455
		β_2	1.422*** (0.390)	
	Spain	β_1	-1.250 (1.044)	0.350
		β_2	1.522*** (0.493)	

Note: the number in parentheses indicates standard error of the coefficient. ***, **, and * indicate the significance on 1, 5, and 10 percent level, respectively.