〔研究ノート〕

Inflation Volatility and Fiscal Policy in Euroland

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Abstract

This paper performs panel estimates that indicate the relationship between inflation and fiscal policy in Euroland and the Organisation for Economic Co-operation and Development (OECD) countries. The results suggest that activist fiscal policies may have an important impact on inflation volatility in Euroland. From a policy perspective, this indicates the possibility of further destabilizing effects of discretionary fiscal policies and their potential for destabilizing income in Euroland.

Introduction

Maintaining price stability is the primary fiscal objective of Euro countries as stated in the Treaty of European Union arts, 2, 3a, 105, and Protocol on the Stature of European Central Bank (ECB). Sovereign countries retain a large degree of fiscal autonomy while monetary policy is centralized and entrusted to an independent central bank, the ECB.[1] Fiscal policy is an arguably thorny issue in the EU policy framework.

This paper provides evidence suggesting that discretionary fiscal policies have contributed to inflation volatility. This paper's approach is similar to that of Fatas and

Mihov (2003) and Rother (2004), who found that discretionary fiscal policies have contributed to output volatility and inflation. By applying this approach to inflation in Euroland and OECD countries, this paper evaluates whether fiscal policy has brought inflation volatility.

This paper is structured as follows: the next section is a theoretical background of this study, followed by a section on the empirical aspects and then results. The final section concludes with a brief summary.

Theoretical Aspects

How do fiscal policies affect inflation? Possible outcomes of public fiscal policies, in reality, can affect inflation, including impact on aggregate demand, spillovers from public wages into the private sector, and taxes can affect marginal costs and private consumption. In addition, fiscal policy can affect inflation by influencing public expectations regarding the ability of future governments to redeem outstanding public debt (Rother, 2004).

The relationship between fiscal 'deficits' and inflation should be considered. One link is through a dependent central bank. If the government has a strong influence on monetary policy, there is a high probability that it will use its power for its own objectives. Thus, the government might simply turn to the central bank to finance deficits directly, or it might put pressure on the central bank to keep interest rates low and reduce government borrowing costs.

Independent central banks, however, might have an incentive to generate surprise inflation in response to fiscal developments. As Barro and Gordon (1983) and Rogoff (1985) stated, independent banks may reduce inflation if they perceive that consolidation as a technique for maintaining fiscal sustainability is more costly for the economy. These days, some central banks use inflation targeting and these banks are apt to do so. The European Central Bank (ECB) is no exception.

Empirical Approach

Empirical results in the literature regarding the impact of fiscal policies are mixed. Although there is some support for a link when considering instances of high inflation, findings outside such environments tend to suggest at best a weak relationship. A possible reason lies in the ability of monetary policy to offset short-term inflationary effects of fiscal policies, thereby neutralizing them in the long-run (Rother, 2004). Another reason is that fiscal policy data are generally available only at relatively large intervals, and empirical analyses may fail to detect existing short-run relationship.

There have been few studies regarding the relationship between fiscal policy and inflation volatility. Among the harmful effects of inflation, the negative consequences of inflation volatility should be of particular concern. These effects include higher risk premium, hedging costs, and unforeseen redistribution of wealth. Friedman (1977), Al-Marhubi (1998), and Judson and Orphanides (1999) found that inflation volatility has contributed to lower economic growth. Cottarelli et al. (1998), Catao and Terrones (2001), Arratibel et al. (2002) and Fischer et al. (2002) demonstrated a strong relationship between fiscal deficit and inflation. Campillo and Miron (1996) and Fuhrer (1997) considered the stances of central banks. However, there has been little research analysing the relationship between fiscal policy and inflation volatility.

The relationship between fiscal shocks and inflation should be also analysed. Although some studies have considered it, there is no consensus regarding conclusion. For example, Marcellino (2002) found a small positive effect on inflation, and on the other hand, Mountford and Uhlig (2002) found a large extent effect.

This paper mainly establishes the links between inflation volatility and fiscal policy volatility, taking into account additional explanatory factors. Inflation volatility is explained by the volatility of activist fiscal policies and some additional variables.

For inflation volatility, this paper specifies as follows:

$$\sigma_t^{\pi} = a_0 + a_1 \sigma_t^{d} + a_2 X_t + \varepsilon_t \tag{1}$$

where σ^{π} denotes inflation volatility, σ^{d} the volatility of discretionary fiscal policies, and X a vector of additional explanatory variables.

Two alternative measures for inflation volatility are used. One is defined as the standard deviation over an annual standard deviation of month-to-month consumer price index (CPI) inflation rates (INF_SD1). The other is measured by the log of standard deviation of one-step-ahead forecast errors derived from a time series based on inflation forecast model (GARCH; INF_SD2). The fiscal policy stance is defined as the year-to-year change of budget balance relative to the gross domestic product (GDP). Two variables for fiscal policy, namely activist fiscal policies, are employed. One is absolute value of first difference of year-to-year change in budget balance (in percentage of GDP; FIS_LEVEL). The other is the 5-year standard deviation of year-to-year change in budget balance (FIS_SD). Other variables are expected to have an impact on inflation as listed below.

Inflation level (INF_LEVEL): average annual CPI inflation

Output change (OUTPUT_LEVEL): absolute year-to-year change in output gap (in percentage of GDP)

Output volatility (OUTPUT_SD): 5-year standard deviation of year-to-year changes in output gap

Government expenditure (GOV): Government expenditure relative to GDP

Exchange rate volatility (EXC): Annual standard deviation of month-to-month percent changes in the nominal exchange rate to the US dollar

Money supply volatility (MONEY): Annual standard deviation of month-to-month changes in the ratio of broad money to real output

The empirical analysis involves the fixed effects panel estimation of a single equation

explaining inflation volatility for 11 Euroland countries and 23 OECD countries for data available.[2] To account for possible cross-sectional heteroskedasticity, the estimation method is generalized least squares using estimated cross-section residual variables as weights. The estimation period is from 1985 to 2002.

All results are expected to be positive effects on inflation volatility, however, two variables are exceptions in some cases. One is government expenditure. Large governments tend to reduce the volatility of output and inflation in response to demand shocks using automatic fiscal stabilizers. The other is the exchange rate. In the case of sticky domestic wages and prices, adjustment to shocks to the economy manifests in the exchange rate. In this case, movements in the nominal exchange rate substitute for changes in prices. If the openness of the economy is high, that effect become more dramatic.

Results and Interpretation

The regression results support the reasoning presented above. The results of annual observations are shown in Table 1.

Table 1

Annual Observations

	Euroland		OECD	
	INF_SD1	INF_SD2	INF_SD1	INF_SD2
INF_SD 1(− 1) or INF_SD2 (− 1)	0.198***	0.410***	0.110***	0.352***
FIS_LEVEL	0.037***	0.059**	0.023**	0.046***
INF_LEVEL (− 1)	0.080***	0.126***	0.125***	0.178***
OUTPUT_LEVEL (− 1)	0.030**	0.036***	0.044**	0.052***
GOV (− 1)	− 0.016**	0.002	0.008*	0.025
EXC (− 1)	0.015**	0.003**	0.012**	− 0.001
MONEY (− 1)	0.067**	0.108**	0.054**	0.099**
Adj.R^2	0.523	0.672	0.577	0.703

Note. *** denotes significant at 1% , ** 5%, and * 10% level respectively.

Almost all of the variables are significant with the expected signs. The fiscal stance has the expected positive sign and is highly significant, suggesting that a change in the fiscal stance between years t-1 and t significantly increases the volatility of the inflation. The results for the explanation of INF_SD2 suggest that changes in the fiscal policy tend to increase aggregate inflation uncertainty more. Expectation is important in determining the process of inflation rate.

However, the size of the government no longer has a significant impact on inflation volatility except in one case. Once inflation expectations are accounted for, they have no significant effect. Agents may take the dampening impact of a large government into account. One case has a negative coefficient. Some European countries had large governments, which might have had affected it, as noted. The coefficient of the exchange rate is positive and significant for one case in the OECD. Prices in EU have been flexible. Market integration since the mid-1980s may affect the movement. Results of the 5-year empirical specification are shown in Table 2.

The results are similar to those shown in Table 1, providing empirical support for the

Table 2

Five-year Observations

	Euroland		OECD	
	INF_SD1	INF_SD2	INF_SD1	INF_SD2
INF_SD 1(− 1) or INF_SD2 (− 1)	0.202***	0.422***	0.123***	0.355***
FIS_SD	0.039***	0.069***	0.030***	0.047***
INF_LEVEL (− 1)	0.082***	0.130***	0.124***	0.180***
OUTPUT_LEVEL (− 1)	0.029**	0.033***	0.048**	0.059***
GOV (− 1)	− 0.018**	0.006	0.013*	0.028
EXC (− 1)	0.010**	0.004**	− 0.018**	− 0.005
MONEY (− 1)	0.070**	0.129**	0.067**	0.108**
Adj.R^2	0.555	0.696	0.613	0.744

Note. *** denotes significant at 1% , ** at 5%, and * 10% level respectively.

notion that changes in the fiscal policy have a significant positive effect on inflation volatility. However, it should be noted that the size of impact of activist fiscal policies on inflation variability is larger.

Conclusions

This paper provides empirical support for the notion that changes in the fiscal policy have a significant positive effect on inflation volatility. From a policy perspective, these results provide further evidence that discretionary fiscal policies may have destabilizing rather than stabilizing effect on the economy in the EU.

Fiscal policy remains a national responsibility in EU, but it should be conducted in a manner that takes account of spillovers from national fiscal policies in an integrated economic area and is consistent with the goal of maintaining price stability.[3]

Papers considering the relationship between fiscal policy and inflation volatility are few. The relatively week findings regarding the impact of fiscal policies on inflation may be due to the high rigidity of fiscal policies relative to monetary policies. As fiscal policies are usually decided and implemented annually, fiscal impact on annual inflation rates may be difficult to detect. Additional research is needed.

Notes

1. Fiscal policy at the national level would be stifled with a deficit ceiling of 3%of GDP.
2. Luxembourg is excluded because of data availability. There are countries now participating in the OECD, however, Czech Republic, Greece, Hungary, Korea, Luxembourg, Poland, and Slovak Republic are also excluded due to data availability.
3. This is the motivation behind the Stability and Growth Pact.

Acknowledgements

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