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# Monetary–fiscal policy interaction and fiscal inflation: A tale of three countries

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ABSTRACT

We study the impact of the interaction between fiscal and monetary policy on the low-frequency relationship between the fiscal stance and inflation using cross-country data from 1965 to 1999. In a first step, we contrast the monetary–fiscal narrative for Germany, the U.S., and Italy with evidence obtained from simple regression models and a time-varying VAR. We find that the low-frequency relationship between the fiscal stance and inflation is low during periods of an independent central bank and responsible fiscal policy and more pronounced in times of non-responsible fiscal policy and accommodative monetary authorities. In a second step, we use an estimated DSGE model to interpret the low-frequency measure structurally and to illustrate the mechanisms through which fiscal actions affect inflation in the long run. The findings from the DSGE model suggest that switches in the monetary–fiscal policy interaction and accompanying variations in the propagation of structural shocks can well account for changes in the low-frequency relationship between the fiscal stance and inflation.



## 1. Introduction

In a recent paper, Summers (2014) paints a dire picture of future macroeconomic developments, pointing to the risk of a secular stagnation with a long period of poor economic growth and permanent negative natural rates of interest. He highlights policy interventions that could further reduce the real interest rate as a possible way out. With nominal interest rates close to zero, monetary policy alone is not up to the task, calling for fiscal policy to step in to reduce real interest rates through subdued fiscal inflation. Economic models that allow fiscal policy to play an important role in determining the price level – such as the fiscal theory of the price level (FTPL) – are thus brought to the center of attention.[1] However, with the exception of Loyo (1999) who considers Brazil in 1980s, empirical evidence in favor of the FTPL is mainly limited on the U.S. For example, Cochrane (1999) and Leeper et al. (2015) show that U.S. post-World War II inflation could be interpreted through the lens of the fiscal theory, while another growing body of work argues that the fiscal theory has prevailed in some historic periods of the U.S. (e.g. Woodford, 2001; Davig and Leeper, 2007; Chen et al., 2015; Bianchi, 2012; Bianchi and Ilut, 2014; Gonzalez-Astudillo, 2014).

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[1] The first studies to develop a theory for the interaction between monetary and fiscal policies are Sargent and Wallace (1981) and Leeper (1991).

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In this paper, we provide further cross-country evidence for the FTPL by contrasting the experience of the U.S. between 1965 and 1999 with Italy and Germany, which are well known to have had different monetary and fiscal policy interactions in place.[2] We focus on the relationship between the fiscal stance and inflation and proceed in two complementary ways. We first estimate the time-varying low-frequency relationship between these two variables using a medium-sized time-varying VAR model (TVP-VAR). The focus on the low frequency is in the spirit of Lucas (1980) who suggests that change in the systematic relationship between two variables is best recovered beyond business cycle frequencies. In a second step, we employ a DSGE model to interpret the low-frequency measure structurally and to illustrate the mechanisms through which fiscal actions affect inflation in the long run. In this exercise, we allow specifically for a switch in the policy regime, i.e. the interaction between monetary and fiscal policies.

Our findings from the time-varying VAR suggest that the low-frequency relationship between the fiscal stance and inflation varies across time and country. More importantly, the evolution of the low-frequency relationship is strikingly consistent with the narrative evidence on the interaction of the monetary and fiscal authority for all three countries. For Italy, we find a high low-frequency relationship up to the late 1980s and a pronounced drop in the relationship in the early 1990s. This empirical result corresponds to the fact that Banca d'Italia was required by law to buy government securities at a fixed interest rate during 1970s, moved gradually towards independence in the early 1980s, and became independent in the run-up to the Maastricht Treaty which Italy signed up to during 1990s. For Germany, the low-frequency relationship fluctuates around zero throughout the sample. This virtually non-existent relationship corresponds to the well-established fact that, as early as 1970s, Germany had an independent central bank focusing on price stability and a fiscal policy which backed outstanding government debt. For the U.S., the inauguration of Paul Volcker as Fed chair coincides with the biggest drop in the estimated low-frequency relationship between the fiscal stance and inflation (see Kliem et al., 2016). This empirical finding indicates that U.S. monetary policy possibly accommodated fiscal policy during the pre-Volcker era and determined the inflation rate in combination with a fiscal authority that backed outstanding government debt after Paul Volcker became chairman of the Federal Reserve in 1979.

Given the findings of the TVP-VAR model we investigate further whether the change in the low-frequency relationship is indeed due to a change in the interaction between monetary and fiscal policies. Using a counterfactual experiment of the TVP-VAR model, we first demonstrate that the change in the low-frequency relationship in Italy as well as in the U.S. cannot be attributed to a change in the volatilities of the structural shocks. Second, we estimate a standard DSGE model on U.S. data from 1984 to 2009. We fix the volatilities of the structural shocks to their estimated values and counterfactual analysis for the remaining parameters. The results of the counterfactual analysis pinpoints the fact that the policy regime is the crucial element of the DSGE model determining the low-frequency relationship between fiscal stance and inflation. In particular, a high low-frequency relationship between the fiscal stance and inflation – as observed in our empirical analysis – is much more likely within an FTPL model setup. Therefore, our findings confirm the aforementioned narrative evidence that a change in the fiscal and monetary policy interaction can explain the change in the low-frequency relationship of interest.

The paper is structured as follows: Section 2 describes the dataset, sets up the time series model, presents the evolution of the low-frequency relationship, and relates its evolution to narrative evidence of each country; Section 3 sets up the medium-scale DSGE model to show how the changes in the low-frequency relationship are related to changes in the interaction between monetary and fiscal policies; Section 4 concludes.

## 2. Three countries, inflation, and the fiscal stance

In this section, we describe the dataset, set up the time series model, estimate the low-frequency relationship between inflation and the fiscal stance, and relate the estimation results to the narrative accounts for Italy, Germany, and the U.S.

### 2.1. Data

In this subsection, we describe the data sources and the transformation of the data. Following Sims (2011) and our previous work (Kliem et al., 2016), we employ primary deficits over one-period lagged debt as a measure of fiscal stance. This measures debt growth minus the gross real interest rate. In contrast to the debt over output ratio or debt growth, this measure is not influenced by variables which are not controlled directly by the fiscal authority, such as output or the real interest rate. In order to gain intuition for the measure of fiscal stance, consider the opposite of our measure – government's primary surplus over one-period lagged debt. This summarizes net payments to bondholders either through interest rates or through the retirement of bonds. In other words, it represents the decrease in the fiscal authority's future liabilities. Conversely, a change in the deficits over debt measures the change in the fiscal authority's future liabilities. For the sake of readability, we denote the latter variable deficits over debt instead of primary deficits over one-period lagged debt throughout the paper.

[2] Our choice of the set of countries is in line with Brunner et al. (1973), who studied the influence of monetary and fiscal policies on inflation between 1948 and 1971.