Carmine Trecroci

BUSINESS CYCLES, MACROECONOMIC POLICIES AND CAPITAL MARKETS

Fondazione Italo Gnutti onlus

Studies in Money, Banking and Finance

FrancoAngeli

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STUDIES IN MONEY, BANKING AND FINANCE

Foreword

This new series of volumes provides an outlet for recent developments in the economics of money, banking and finance.

Until the mid-1960s, economists working in these three fields operated in relative isolation. Despite the fact that some leading economists spanned these fields and made significant contributions in more than one of these areas (Paul Samuelson, Milton Friedman, Franco Modigliani, and James Tobin are obvious examples), it was relatively rare to find unifying approaches across them. Monetary economics was in many respects a sub-discipline of macroeconomics. The economics of banking concentrated mainly on institutional structures, examining the operation and flow of funds of banks in the context of a relatively static and long-established sector. Arguably, the analysis of the banking sector had much more in common with traditional industrial economics than with the modern analysis of economic incentives and information. Modern microeconomic theory has had a profound impact in changing our understanding of the economics of banking and corporate structures. Finance was an area largely dominated by the accountancy profession, and despite occasional forays by economists, the tools of analysis remained those of professional investors until the recent advent of modern finance theory.

One look around graduate programmes in economics shows the magnitude of the change in recent years. Most leading universities will now offer graduate Masters and Ph.D. programmes at the interface of these three fields, reflecting this shift in the research agenda. Our own institutions, the Universities of Brescia and Glasgow, offer several graduate courses in the areas of money, banking and finance, and are collaborating much more actively with practitioners and academics in cognate fields such as Accountancy and Business, to bring new approaches to graduate teaching.

The purpose of this Series is twofold: it will allow new research to be published, especially by new scholars, as well as providing an outlet for surveys of the existing academic literature which provide key advanced material for graduate programmes. This Series offers an opportunity for emerging scholars to publish their work in a book format, otherwise unavailable in an integral form in standard journal outlets.

We are particularly grateful to the Fondazione Italo Gnutti for financing this series of volumes, which we believe fills an important gap in the current market.

Anton Muscatelli, University of Glasgow
Franco Spinelli, Università di Brescia

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The roots of this book are in a series of research projects I conducted in the past five years. The very existence of it owes a great personal and intellectual debt to Franco Spinelli, who encouraged a large part of this research and later persuaded me to draft the essays collected here.

I am indebted to a number of colleagues at the Universities of Glasgow, Naples, Milan-Bicocca, Trento, Bari and Brescia, and researchers at the European Central Bank in Frankfurt, whose comments provided me with stimulus and helped sharpening the focus of these applied essays. I am particularly grateful to Anton Muscatelli, Patrizio Tirelli, Ulrich Woitek and Juan-Luis Vega.

I thank the Fondazione "Italo Gnutti onlus" for its generous support of the "Studies in Money, Banking and Finance", and of this book.

PREFACE

The 1980s and 1990s were a period of remarkable changes in the monetary and financial landscape. Financial innovation and integration have relentlessly progressed. Business cycle volatility has decreased in many advanced economies. We have experienced important reforms in both policy institutions (greater central bank independence; inflation targets; monetary unification in Europe) and policy conduct (inflation tamed; limits to countercyclical fiscal policies). On the other hand, recent developments in equity, bonds and real estate valuations signal, according to many observers, serious threats to financial and macroeconomic stability.

The essays collected in this book reflect an effort to glean some insight into many of these features. They originated in a wide research agenda devoted to the investigation of a number of applied issues pertaining to business cycle, macroeconomic policies and capital markets. The aim is somewhat to bridge the gap between theoretical predictions and empirical validation that has often characterized the research on structural changes.

Recent reforms and events have revived the debate on the interdependence between monetary and fiscal policies, as macroeconomic stabilization is always the result of (potentially conflicting) views and strategies of both authorities. In the first and second Chapter I study fiscal-monetary interactions in the US and pre-EMU Europe.

Chapter 3 investigates the extent to which information on the behaviour of monetary and non-monetary variables can be helpful in predicting future price developments in the euro area.

The process of monetary unification in Europe raises a number of interesting questions on the stabilization of macroeconomic shocks. I devote the fourth Chapter of this book to study the extent to which real and monetary shocks determine fluctuations in real exchange rates. If real shocks had persistent effects on real exchange rates, this would put fixed exchange rate systems and monetary unions into a different, more problematic, perspective.

The crucial task of modern finance theory is to identify and measure the sources of macroeconomic risk that drive asset prices. In the last Chapter of this book, I investigate the joint behaviour of business cycle variables, like GDP, aggregate consumption and investment, and of stock market prices and valuation ratios, like price/earnings and price/dividend ratios.

Overall, the studies in this book deal with issues that are central to our understanding of capital markets and the macro economy. In so doing, I think they provide a few answers to a number of open questions in these research contexts.

1. BUDGET POLICY, THE FED, AND US BUSINESS CYCLE

"(...) And should current economic weakness spread beyond what now appears likely, having a tax cut in place may, in fact, do noticeable good. (...)"

Testimony of Fed Chairman Alan Greenspan before the
Committee on the Budget, U.S. Senate, January 25, 2001

"(...) The budget scenarios considered by the CBO…suggest that, under a range of reasonably plausible assumptions about spending and taxes, we could be in a situation in the decades ahead in which rapid increases in the unified budget deficit set in motion a dynamic in which large deficits result in ever-growing interest payments that augment deficits in future years. The resulting rise in the federal debt could drain funds away from private capital formation and thus over time slow the growth of living standards.(…) The dimension of the challenge is enormous. (...)"

Testimony of Fed Chairman Alan Greenspan before the
Committee on the Budget, U.S. House of Representatives, February 25, 2004

1. Introduction

In the past two decades, the US economy has experienced remarkable swings in the use of monetary and fiscal policy instruments. Figure 1.1 plots the quarterly time series of government (federal plus state and local) expenditures and receipts as fractions of GDP, 1980Q1-2004Q3; Figure 1.2 shows the ratio of total budget deficit to GDP and a measure of the US output gap.

Tax receipts as a fraction of domestic income have followed a clear upward trend up until the first Bush jr. administration's tax cuts, whereas the spending/GDP ratio displays an overall downward tendency, though mitigated by rapid increases during the Reagan and Bush sr. administrations. The relative size of both these expansionary episodes and of the marked fiscal consolidation of the two Clinton administrations is clearer when one looks at the budget deficit/GDP ratio. The second chart also confirms the strong countercyclical behaviour of government expenditures, while the 2001-2003 tax cut stands out as a macroscopic episode of discretionary fiscal policy.

Turning to monetary policy, Figure 1.3 plots US inflation along with implied *ex ante* real interest rates. Apart from the shift to the current low level of inflation following the early 1980s, one can easily capture the major episodes of monetary easing of the early 1990s and 2000s, as well as the tendency of policy rates to change even in the absence of substantial inflation threats. The impression that one draws from this graph is that US monetary

Figure 1.1 – US government expenditures and receipts as fractions of GDP, 1980Q1-2004Q3

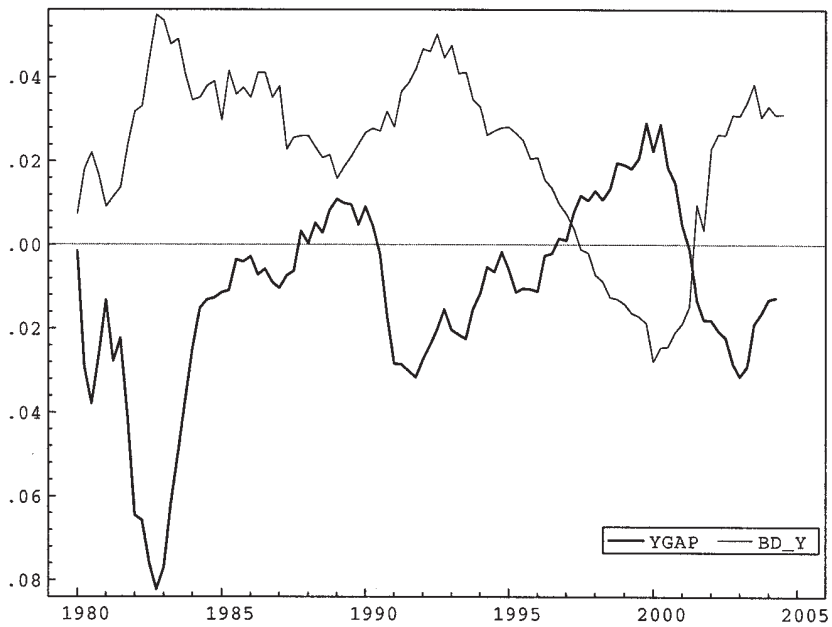

Figure 1.2 – Ratio of US total budget deficit to GDP and a measure of the US output gap, 1980Q1-2004Q2

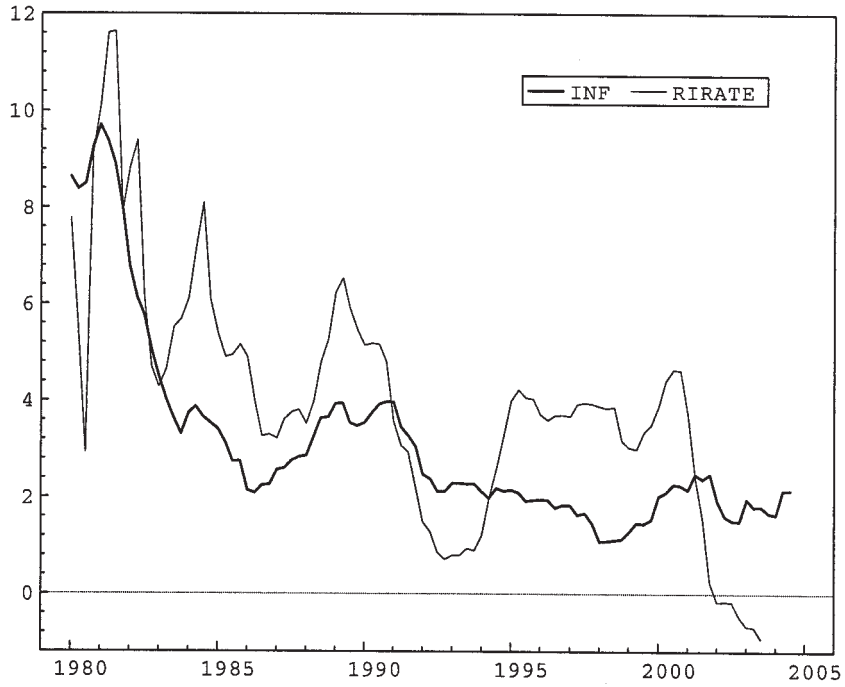

Figure 1.3 – US inflation and implied ex ante real interest rates, 1980Q1-2004Q2

policy has been steered, for most of the past two decades, to follow developments in the level of economic activity.

A high degree of activism is therefore apparent in both policies, and in both cases policy authorities seem to have closely monitored, and reacted to, developments in the business cycle. What about the degree of interaction between policy strategies? After all, traditional macroeconomic theory devoted great attention to the nature of the interdependence between fiscal and monetary policy. Conventional analysis studied the outcomes, in terms of optimal policy, of a stylized case in which a single policymaker controlled both policy instruments but aimed at mutually inconsistent objectives. However, the recent and widespread move to greater central bank independence has somehow altered the terms of this debate, turning the attention to the interactions between monetary and fiscal policies when policymakers' targets differ.

In Europe, the interplay between a single monetary authority and the independent national fiscal policymakers is a recurring theme in both the theory and the implementation of the European monetary integration. The Stability and Growth Pact has therefore imposed some limits to countercyclical fiscal

policies, and the role of monetary policy in stabilising country-specific shocks has long been debated[1].

On a global scale, the debate has been inspired by the prolonged weakness of the Japanese economy in presence of massive monetary and fiscal policy stimuli, and by the attention paid by monetary authorities to the output effects of major budgetary expansions in the US. In the latter, centralized and mutually independent monetary and fiscal policymaking bodies make these issues even more lively debated[2].

Despite the growing theoretical interest in the interactions between economic policies, there is relatively scarce empirical evidence on them. A large body of literature analyses the effects of monetary policy, and the way in which monetary authorities respond to macroeconomic conditions. However, the empirical work on the effects of fiscal policy is still in its infancy[3], whilst even less attention has so far been devoted to the interdependence between monetary and fiscal policies in advanced economies. The major studies in this area which we are aware of are those by Mélitz (1997, 2000), Wyplosz (1999) and von Hagen et al. (2001). For instance, using data for a number of OECD economies, US included, Mélitz (1997) finds that fiscal and monetary policy instruments tend to move in opposite directions to each other, that is, macroeconomic policies tend to act as strategic substitutes.

This chapter provides some additional evidence to characterise fiscal-monetary interdependence in the US on an empirical level. We estimate conventional and Bayesian VAR models to capture the pattern of fiscal-monetary interactions. VAR studies, while extremely popular in the analysis of monetary policies, are relatively controversial as tools for fiscal policy analysis. This is because modern macroeconomic models argue that government decisions may trigger changes in aggregate consumption and investment well in advance of significant changes in fiscal aggregates[4]. This certainly calls for particular care in the identification and determination of the dynamic properties of our econometric model. Moreover, economic agents' response to fiscal changes is often crucially affected by the details of the announced policy measures, which are reasonably unveiled only at the implementation stage of the policy process. Finally, one often conducts structural analysis in a monetary policy VAR framework because of a direct interest in policy shocks, i.e., unexpected changes of the monetary policy stance. To the contrary, it may be interesting to obtain a more complete description of both the macroeconomic effects of fiscal policy changes and the dynamic interactions with monetary

1. See Beetsma and Debrun (2004).

2. "...And should current economic weakness spread beyond what now appears likely, having a tax cut in place may, in fact, do noticeable good". Testimony of Fed Chairman Alan Greenspan before the Committee on the Budget, U.S. Senate. January 25, 2001.

3. See, for instance, Blanchard and Perotti (2002), and Fatas and Mihov (2001).

4. See Mountford and Uhlig (2004).

policy through macroeconomic stabilization. The Bayesian VAR we estimate with the help of the well-known Minnesota prior also turns useful in order to address the issues of structural change and policy shifts.

The aim of this chapter is therefore to ascertain the nature of interdependence between macroeconomic policies in the US. In particular, we estimate VAR models to investigate whether the way US authorities have employed monetary and fiscal policy instruments follows a clear substitutability/complementarity pattern. The estimation of our models over sub-samples and the implementation of Bayesian VAR techniques also allow us to check whether the relationship between policies has remained constant throughout our sample period (1970-2004). For the US, the early 1980s are seen as a period of sustained and permanent regime shifts in both monetary policy conduct (see Clarida, Galì and Gertler, 1998) and business cycle volatility (McConnell and Perez-Quiros, 2000; Stock and Watson, 2003). These two facts, besides additional dynamics triggered by changes in the conduct of fiscal policy, might have had some repercussions on the relationship between policy instruments, and so on the nature of fiscal-monetary interactions, which we should therefore think as changing over time.

The use of VAR models for examining fiscal-monetary interactions can be further motivated. For instance, one could check whether introducing fiscal policies in models that are traditionally employed for monetary policy analysis alters the view they tend to yield on how the Fed responds to output and inflation shocks, and the one on US monetary policy's transmission mechanism.

A final objective of this exercise is to shed some light on the transmission of US budget shocks to the economy. As we said, the empirical evidence on this issue is still scant. While the expansionary effects of unexpected fiscal policy predicted by standard-textbook macroeconomic theory are still to be fully tested[5], the attention often focused on possible non-Keynesian effects (see Giavazzi and Pagano, 1990, 1996), especially following large fiscal stabilization events. Also, identifying the response of US fiscal policymakers to inflation and output shocks would be valuable information.

This chapter is organised as follows. Section 2 describes the main features of the existing theoretical and empirical literature on monetary-fiscal interdependence, while Section 3 outlines our empirical methodology. In Section 4 we report and comment on our empirical findings. Section 5 concludes.

2. Monetary and Fiscal Policy Interdependence: the Existing Literature

Buti, Roeger and in't Veld (2001) study monetary-fiscal interactions in a simple model in which the central bank has an objective for both inflation and

5. See for example the issues raised by Alesina and Perotti (1997).

nominal interest rates, whereas budget policy pursues output and deficit targets. The authors show that the sign of the interdependence that arises depends on the sign of the shocks hitting the economy. Aggregate supply shocks push authorities to use policy instruments according to a mutually offsetting fashion, whereas cooperation prevails following aggregate demand shocks.

Dixit and Lambertini (2003a, b) investigate the strategic relationship between fiscal and monetary policy in a traditional political-economy setting. Discretion is the regime prevailing for the conduct of fiscal policy, while monetary policy is delegated to a central bank that can only partially control inflation, in turn affected also by budgetary decisions. The main result of their studies is that fiscal discretion endangers monetary commitment. As to the sign of the relationship between stabilization policies, Dixit and Lambertini show that if fiscal policy has expansionary effects on output and inflation, then monetary and budget policies tend to move in opposite directions. If expansionary fiscal policy has non-Keynesian effects, instead, complementarities between policies would emerge. The exact configuration of policymakers' preferences is of capital importance in determining welfare effects: if fiscal authorities' output and inflation targets are higher than those characterising central bank's loss function, then strategic interactions lead to monetary and fiscal policy being too contractionary.

A whole additional set of theoretical predictions emerges from recent developments in the definition of the fiscal requirements for price stability (see Woodford, 2001, 2003), work which started with the so-called Fiscal Theory of Price Level Determination (FTPLD). This theory explores the possibility of non-Ricardian fiscal policies, i.e., policies that in essence endanger government's intertemporal solvency: in this case price stability becomes unattainable. While the exact conditions under which this result holds are still widely debated, some form of commitment to a Ricardian fiscal policy is often seen as a prerequisite for price stability (Canzoneri, Cumby and Diba, 2001). The fiscal commitment in question should imply a systematic reaction of deficit levels to changes in the debt level. From the viewpoint of the monetary-fiscal interactions that we study, this implies that with nonzero and stable debt levels the interest rate rise required to stabilize an outburst of inflation should be sterilized to offset its impact on debt-service costs. Thus, some kind of stabilizing response of budget deficits to inflation shocks should show up in the models we estimate.

On the other hand, the question of the impact of government tax and spending decisions on prices is still under study. For instance, the evidence from macroeconometric studies, readily summarized by Henry, Hernandez and Momigliano (2004), and relative to the euro area, points to a limited effect on prices, on impact, of changes in government demand and direct taxes. In contrast, changes in indirect taxes have a relatively sizeable impact. The overall effect seems to take some time to fully materialise.

The empirical evidence on the US is to our knowledge very thin[6]. The available evidence on other countries is so far almost uniformly based on multi-country, panel data analysis. We have already reported that work by Mélitz (1997, 2000) and Wyplosz (1999) finds evidence of a substitutability relationship between policies. von Hagen, Hughes-Hallett and Strauch (2001) find instead that in the countries belonging to EMU expansionary fiscal policies tend to accompany monetary contractions, whereas interest rate policies broadly accommodate fiscal expansions. This interplay clearly configures a complex and asymmetric interdependence between policies. Interestingly, however, the same authors find that budgetary stances on the road to EMU have apparently become less sensitive to both monetary shocks and cyclical conditions, perhaps in the effort to meet the budgetary constraints embedded in the Maastricht Treaty.

3. Our Approach to the Measurement of Actual Fiscal-Monetary Interdependence

The study of the transmission mechanism of monetary policy and, in fact, the vast majority of monetary policy analyses, have been amongst the preferred areas of employment of vector autoregressive models since Sims's (1980) seminal contribution. The appeal of VARs is largely due to their flexibility. They provide a simple and powerful way to describe the dynamic interactions between endogenous variables, and so they turn out to be generally useful for the analysis of economic policies[7]. Finally, they allow to jointly identify the macroeconomic effects of policy decisions and the reaction of policy authorities to developments in the business cycle.

The estimation and analysis of a VAR model essentially involve:

A. Estimating a reduced-form model which includes macroeconomic variables, policy instruments, and intermediate and final policy objectives. All these are treated as jointly endogenous, thus avoiding the implementation at this stage of inappropriate identifying restrictions.
B. Applying some restrictions to the VAR to just-identify the model, and examine the effects of structural shocks through impulse response analysis and forecast error variance decomposition, to which one can attribute economic interpretation.

6. Some of the contributions collected in Beetsma et al. (2004) somehow start to bridge this gap. In particular, the approach followed in the companion paper by Muscatelli et al. (2004a) is close in spirit to the present one.

7. See Leeper, Sims and Zha (1996).