On the sources of macroeconomic stability in the euro area

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A R T I C L E   I N F O

A B S T R A C T

In the mid-1990s the euro area experienced a change in macroeconomic volatility. Around the same time, at business cycle frequencies the correlation between inflation and money growth changed markedly, turning from positive to negative. Distinguishing the periods pre- and post-1994, we estimate a dynamic stochastic general equilibrium model with money for the euro area. The model accounts for the salient facts. We then perform several counterfactual exercises to assess the drivers of these phenomena. The moderation of real variables was essentially due to relatively smaller shocks to investment, wage markups and preferences. The apparent lack of evidence for the quantity theory of money in the short run and the changes in the volatility of nominal variables resulted primarily from a more anti-inflationary and gradual monetary policy.

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1. Introduction

Between the mid-1990s and the late 2000s European countries experienced a period of unusual macroeconomic stability. This episode was accompanied by several key macroeconomic facts including (i) a sharp reduction in macroeconomic volatility and (ii) a sharp change in the short-run correlation of inflation with money growth, whereas (iii) the long-run correlations of nominal variables appear to have been more stable. The objective of this paper is to identify the drivers of these phenomena. In particular, one may well wonder if the monetary policy strategy of committing to price stability was a trigger factor. If this is the case, it illustrates that economic policies can have long-lasting effects and that the observed facts were not simply the result of a fortuitous period of smaller or mutually offsetting economic shocks.

We argue that only the combination of a more anti-inflationary and gradual monetary policy with a change in the properties of economic shocks allows the set of macroeconomic facts to be explained. To reach this conclusion, we first estimate a structural model over two sub-samples identified by some break tests and then implement several counterfactual exercises. Our analysis is based on a dynamic stochastic general equilibrium model *à la* Smets and Wouters (2007), augmented with money holding decisions and money growth in the Taylor rule. We follow an area-wide approach for at least two reasons. First, in spite of some magnitude differences, the facts set out above are features common to most member countries. Second, significant structural and policy differences between members cannot be detected over this period. Clarida et al. (1998), Angeloni and Dedola (1999), and Jondeau and Sahuc (2008) show in particular that the Banque de

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France and the Banca d'Italia followed the moves of the Deutsche Bundesbank most closely. This helps to justify the underlying assumption of a single central bank over the pre-1994 period.[1]

We find that the decrease in both innovation variance and the persistence of structural shocks explains the sharp reduction in the volatility of real macroeconomic variables (output and its components, real wages and hours worked). Our estimates reveal that the moderation process was due, to a great extent, to lower levels of investment, wage markup and preference shocks, and to a lesser extent, to productivity shocks. By adopting a broad interpretation of these disturbances, we can assert that an improvement (i) in the transformation of household savings into new productive capital and (ii) in the overall labour market performance during the late 1990s and 2000s are key to understanding these macroeconomic developments. However, a more complex picture emerges when we study changes in nominal variables. While at very-low frequencies the correlations between the nominal variables are strong irrespective of the sub-sample considered, the apparent lack of evidence for the quantity theory of money in the short run and the increase in money growth volatility result from a more anti-inflationary and gradual monetary policy. A combination of a change in monetary policy and good luck appear to have contributed to a moderation of inflation and of the short-term interest rate. We explain how simultaneous changes in the intensity of shocks and in monetary policy can alter the course of macroeconomic variables and their interplay. In particular, we show that monetary policy is more gradual and monetary policy shocks more prominent during the post-1994 period, making the correlations between nominal variables weaker. Furthermore, implementing price stability or inflation targeting while the quantity theory of money, imposed by construction in the model, establishes similar variations between prices and the monetary aggregate necessarily induces a greater decrease in the cross-correlations. Otherwise, when a central bank follows an interest rate rule, the money stock is endogenous and inflation is fixed by the policy rule. Consequently, in the presence of a more anti-inflationary policy, the money stock should respond by shifting more strongly to clear the money market.

So far, research on the causes of historical changes in macroeconomic performance has focused almost exclusively on the US economy and its results remain inconclusive. In addition to possible methodological differences, the conflicting results may stem from the fact that the literature has concentrated on one single empirical fact at a time. For instance, studies on the "Great Moderation" have found that it stemmed either from changes in monetary policy (Lubik and Schorfheide, 2004; Boivin and Giannoni, 2006), structural changes (Canova and Gambetti, 2009; Gali and Gambetti, 2009) or smaller shocks impinging on the economy (Justiniano and Primiceri, 2008; Liu et al., 2011). Others like Sargent and Surico (2011), Cogley et al. (2012), and Teles and Uhlig (2013) explain the large departures from a unitary money growth/inflation relation in the US by the dependence of the coefficient estimate associated with the regression of the two variables on the systematic response of monetary policy. The few papers on the euro area include Canova et al. (2008) and Cecioni and Neri (2011) who find respectively that (i) there had been sizeable changes in the volatilities of structural shocks and (ii) a combination of lower price stickiness and a greater inflation stabilization offset each other in generating the apparent stability in the impact of euro area monetary policy. It is surprising that there has not been more research on the euro area since the US and euro area economies do not share the same characteristics and are not necessarily at the same point in the economic cycle.[2] In any case, the different explanations are not mutually exclusive in explaining a set of macroeconomic facts.

The paper is structured as follows. Section 2 documents the empirical regularities that motivate this paper. Section 3 describes the structural model and Section 4 presents the estimation procedure and reports the estimation results. Section 5 analyses the drivers of the empirical facts and a final section concludes.

2. Empirical facts

In this section, we present the macroeconomic data (running from 1980 to 2007) and search for structural breaks in the mean and volatility of time series. We then describe two facts that occurred in the euro area over the last three decades. The reason for ending the sample in 2007 is that we wish not to blur the results with the introduction of unconventional measures and the zero lower bound episode in the aftermath of the financial crisis. In that context, the interest rate channel is broken and the traditional relationships between nominal variables are no longer valid. At zero interest rates, money and bonds are perfect substitutes and the demand for money is not uniquely pinned down. If we are to find changes in the relationship between inflation, the interest rate and money growth, they will not be due to zero bound considerations.

2.1. Data

The quarterly euro area data are extracted from the AWM database compiled by Fagan et al. (2005), except for the monetary aggregate, hours worked and the working age population. Inflation is measured by the first difference of the logarithm of the GDP deflator (YED), the short-term nominal interest rate is a three month rate (STN), output growth is the first difference of the logarithm of real GDP (YER), consumption growth is the first difference of the logarithm of real

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[1] As some studies surveyed in Angeloni et al. (2003) find that the exchange rate channel did not play an important role at the area-wide level, we also neglect the openness dimension. In addition, we do not include financial frictions since Gerali et al. (2010) show that they only played a relevant role in the euro area from the financial crisis of 2007–2008 onwards.

[2] Sahuc and Smets (2008) show that the two zones were hit by different types of shocks and Cabanillas and Ruscher (2008) find that the historical shifts in euro area policy-making are more significant than those observed in the US.