



Euro introduction: Has there been a structural change? Study on 10 European Union countries[☆]



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ABSTRACT

The introduction of the Euro in January 1999 consecrated the achievement of a single currency system within most of the European Union. Despite the dramatic change in the macroeconomic dynamics that this event is likely to have caused, the literature has paid little attention to testing for the existence of such a break and establishing its qualitative characteristics.

This empirical study, based on the Blanchard and Quah (1989) methodology for seven countries having adopted the Euro currency and three members of the European Union which have preserved their own currencies reveals:

- i) very significant breaks for the Euro countries around 1992 – the year of adoption of the Maastricht Treaty – and 2000, not shared by the three non-Euro countries.
- ii) an increase in the influence of supply shocks on the dynamics of output, unemployment and the interest rate after the breaks for the Euro countries, along with an increase of the part played by monetary disturbances within total demand at long horizons. These conclusions do not generally hold for the three non-Euro countries.

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1. Introduction

The demise of the Bretton Woods system, marked by the end of the dollar's convertibility into gold on August 15, 1971 was followed by a general floating of the world currencies. The 1973 oil crisis then contributed to generate considerable instability in European currencies, resulting in serious economic and social difficulties. The member states of the European Union hence sought to setup a framework which could provide a minimum of stability, at least at the European level, and which could eventually lead to a monetary union.

In 1972 the 'snake in the tunnel' system represented the first attempt towards such a union. It narrowed the fluctuation margins between the community currencies (the snake) in relation to those operating between these currencies and the dollar (the tunnel). However, the 1970s oil shocks caused the European economies to react in diverse ways. This led to sharp fluctuations in the exchange rate, such that by the end of 1977, only five of the nine member states (Germany, Belgium, the Netherlands, Luxembourg and Denmark) remained within the mechanism, the others having allowed their

currencies to float freely. In 1979, the snake was finally replaced by the European Monetary System. This resulted in the creation of the European Exchange Rate Mechanism (ERM), as a renewed attempt to reduce exchange rate variability and achieve monetary stability in Europe.

The revival of the monetary union was initiated in 1989, with the report of the Delors Committee envisaging the achievement of a European Monetary Union (EMU) in three stages. The first stage would consist in tighter cooperation between central banks. The settlement of a European System of Central Banks (ESCB) and the progressive transfer of decision-making on monetary policy to supranational institutions would be the second stage. Finally, during the third stage, the national currencies would have their exchange rates irrevocably fixed in order to be replaced by the European single currency.

In June 1989, the European Council decided that the first stage towards the EMU would begin in July 1990. The Treaty of Maastricht was agreed by the heads of state of the European Union in December 1991, setting out the framework for stages two and three of progress towards the EMU.

Following, from 1994 on, the states had to abide by five convergence criteria in order to lay safe foundations for the third stage. This essentially consisted in an inflation rate aligned on the best performing states, a budgetary deficit not exceeding three percent of GDP, and a government debt not exceeding sixty percent of GDP. In June 1997, the European Council in

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Amsterdam adopted the Stability and Growth Pact, designed to ensure budgetary discipline during the third stage. The Euro was finally introduced on January 1, 1999 in eleven European Union countries. Since then, six additional countries have adopted the Euro currency, and seven other candidate countries should also integrate the system as soon as they abide by the Euro criteria. On the other hand, some countries chose to preserve their monetary independence (Sweden and the United Kingdom), while others such as Denmark decided to adopt the new semi-peg regime implemented by ERM2.

Each of these numerous steps constitutes an opportunity for a structural change in the macroeconomic reaction of the member state economies, especially to monetary policy. This study then focuses on the case of ten European Union countries, seven of them having adopted the Euro and three of them having maintained their own currencies.

The empirical literature dedicated to the study of the macroeconomic dynamics within the Euro framework has become relatively large. But surprisingly enough, there are only few articles taking into account the possibility of a change in macroeconomic dynamics due to the passage to the single currency.

Probably closest to the present work is the article by [Boivin et al. \(2008\)](#). These authors estimate the dynamic response of European Union economies following unexpected monetary shocks, prior and subsequent to the introduction of the Euro. They conclude that the passage to the Euro has led to more homogenous transmission mechanisms across European Union countries, and has resulted in a global decrease of the impact of monetary shocks. The present work supports these conclusions, but only when one considers short horizons. In addition these authors rely on a FAVAR model used to extract the principal components of the economic activity, while this article uses a structural decomposition in terms of supply and demand shocks. Most importantly, these authors arbitrarily select the date of the structural break – established in 1988 or in 1999 – whereas this work endogenously determines the date of the break and formally tests for its statistical significance. Other articles in this literature feature VAR models integrating some monetary factor in order to assess the EMU dynamics (see e.g. [Peersman and Smets \(2005\)](#), [Van Els et al. \(2003\)](#)). Some papers pay more attention to potential asymmetries in the reaction of EU countries or EU applicants towards supply and demand shocks. Their main aim is to appreciate the suitability of the single currency area, and as such, they pay no attention to a potential break in the reaction mechanism. Such papers include [Babetskii et al. \(2004\)](#), or [Frenkel and Nickel \(2005\)](#). Other research works also rely on structural decompositions to analyze the effect of monetary shocks on the economy, such as [Funke \(1997\)](#) or [Eickmeier et al. \(2006\)](#).

Part of the literature on the other hand examines the possibility of a structural break in the dynamic process, such as [Weber et al. \(2009\)](#). These authors use an endogenous bootstrap method to determine the date of the break, found to be 1996. However, the methodology they follow does not actually identify a unique break, but rather a range of breaks all over the period 1984–1996, with an arbitrary selection of the last period. [Zha et al. \(2004\)](#) analyze the effects of the change in monetary policy due to the passage to the European Monetary System. They also postulate the date of the break (in 1979) and do not test it explicitly.

Finally, a few papers are explicitly testing for the presence of a structural break in the data, but they are usually dedicated to subjects which differ from the study of macroeconomic dynamics related to supply and demand shocks. [Marotta \(2008\)](#) examines the possibility of a structural break in the size and speed of the pass-through of market rates into business lending. [Bordes et al. \(2007\)](#) endogenously test for a potential structural break in the equilibrium velocity of M3 in the Euro area. Interestingly enough, the two breaks they identify, around 1993 and 2000, match the results of the present paper. [Gregoriou et al. \(2006\)](#) study potential persisting inflation differentials between European Union members.

Shortcomings in the current literature are twofold: either the analysis is restricted to pure monetary components, and hence ignores the role played by other factors such as supply or real demand shocks in the dynamics of the economy; or the analysis does use some decomposition but neglects the possibility of a break, carrying limited information on the actual changes triggered by the Euro. Furthermore, when some break is taken into consideration, it is most of the time determined exogenously.

The present paper thus contributes to the literature in the two ways. Following the methodology proposed by [Bec and Bastien \(2007\)](#), it first formally dates and tests for the occurrence of a structural break – potentially due to the introduction of the Euro – in the economy of ten European Union countries. The study includes seven Euro countries: Germany, France, Italy, Spain, Belgium, Portugal and Ireland, and three non-Euro countries for the sake of comparison: Denmark, Sweden and the United Kingdom. The second contribution of this work is to propose a quantitative analysis of the respective contributions of each kind of disturbances in the dynamics of these economies, prior to and after the estimated breaks. It relies on a simple three-variable VAR model, using a [Blanchard and Quah \(1989\)](#) decomposition to identify three types of structural shocks: supply shocks, real demand shocks, and monetary shocks. It thus allows to highlight the role played by the sole monetary component with respect to the other shocks, and assess a possible change due to the adoption of the Euro.

These methodologies are preferred over alternative specifications, such as Markov-switching structural VAR models (see e.g. [Rubio-Ramirez et al. \(2005\)](#) for an application to the European Monetary Union), for two reasons. The first is conceptual: Markov-switching models identify transitory shifts in a dynamic process, which may revert later on. The present work, on the other hand, aims at identifying a potential break due to the occurrence of a single and definitive event: the settlement of a monetary union. If such a break occurs, no reversion is then to be expected, which renders Markov-switching SVAR models less relevant than the one-way break methodology retained for this study. The second reason is practical. The methodology developed by [Bai et al. \(1998\)](#) permits the computation of confidence intervals around break dates. This allows to assess the potential simultaneity of breaks across countries through overlaps of confidence intervals, a feature that is not available with Markov-switching SVAR models.

The remainder of the paper is organized as follows: [Section 2](#) proposes a simple theoretical model motivating the use of the Blanchard–Quah decomposition; [Section 3](#) presents the data, then focuses on the test of a structural break, adapting the Sup test defined in [Bai et al. \(1998\)](#) for a structural shift in the transmission mechanism of a VAR model. [Section 4](#) presents the dynamic effect of supply and demand disturbances and [Section 5](#) evaluates their relative contributions to the fluctuations of output and the interest rates of the different countries. [Section 6](#) concludes.

2. Theoretical foundations

This empirical study extends the Blanchard and Quah methodology, assuming that the economy is affected by three kinds of disturbances: supply disturbances, real¹ demand disturbances and monetary disturbances, the latter two composing together the total demand side of the economy. This section develops a simple theoretical model. It is purely illustrative and shows how the dynamics of the three variables included in the incoming VAR setup (output, the unemployment rate and the

¹ The term ‘real’ demand disturbance may be ambiguous. It does not mean that the disturbances are real as opposed to some nominal measurement. The term real is used here to designate the real side of demand (e.g. shocks on fiscal policy), as opposed to the monetary side of demand.

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