



# Inflation dynamics in the euro area and in new EU members: Implications for monetary policy<sup>☆</sup>

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## ARTICLE INFO

### Article history:

Accepted 14 February 2008

### JEL classification:

C51

E31

### Keywords:

New Keynesian Phillips Curve

Time-varying coefficients

Spurious relationships

## ABSTRACT

The paper provides evidence on New Keynesian Phillips Curves (NKPCs) for the euro area and a group of seven new member countries that joined the European Union (EU) in and after 2004 employing two alternative methods of estimation: the generalized method of moments (GMM) and time-varying coefficient (TVC) estimation techniques. The latter technique has the advantage over the former technique in that it can deal with possible specification biases and can detect spurious relationships that may have arisen from the structural changes of the past decades. The NKPCs are used to compare inflation dynamics between the euro area and the group of seven new member countries and are connected with sufficient conditions for monetary policies to be good policies. If the slopes of the short run Phillips curves are similar, in that the frequency of nominal price adjustments are comparable, the implication is that a one-size monetary policy may fit all – that is, both the euro area and the group comprising the new members.

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## 1. Introduction

A prominent part of the discussion concerning the desirability of monetary union in Europe has been the issue whether one size fits all in the implementation of monetary policy.<sup>1</sup> Specifically, in the absence of the traditional adjustment mechanisms, including labor mobility and fiscal integration, typically associated with monetary unions, is a common monetary policy, involving a single interest rate, suitable for achieving price stability in each of the individual member states? The enlargement of the European Union (EU), involving the addition of ten new member states in 2004 and an additional two new members in 2007, has heightened interest in this question.<sup>2</sup> After all, most of these new members differ substantially in terms of structural characteristics from the other members that joined the EU before 2004. As the new members join the euro area, will the European Central Bank's (ECB's) single monetary policy become more difficult to implement?<sup>3</sup>

Most empirical work dealing with the appropriateness of a single monetary policy for different national economies has focused on co-movements of business cycles and/or the similarities of shocks confronting these economies, the idea being that economies

<sup>☆</sup> We thank Harris Dellas, Stephen Hall and an anonymous referee for helpful comments and suggestions. The views expressed are those of the authors and should not be interpreted as those of their respective institutions.

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<sup>1</sup> For a recent discussion, see [Issing \(2004\)](#) and the references cited therein.

<sup>2</sup> The ten new members that joined in 2004 are Estonia, Latvia, Cyprus, Lithuania, Malta, Hungary, Poland, Slovak Republic, Slovenia and Czech Republic. The two new members that joined in 2007 are Bulgaria and Romania. The EU consists of 27 countries. The euro area consists of a subset of EU countries that have adopted the euro. At the time of the initiation of the project in 2006, the euro area consisted of twelve countries. Slovenia, which joined the euro area in January 2007, is treated as one of the new member countries in this project. Cyprus and Malta will join the euro area on January 1st 2008.

<sup>3</sup> The euro area we consider consists of the following twelve countries: Austria, Belgium, Finland, France, Germany, Greece, the Netherlands, Ireland, Italy, Luxemburg, Portugal, and Spain. Slovenia, which joined the euro area on January 1, 2007, is treated as one of the seven new member states in this study.

prone to similar business-cycle dynamics and subject to similar external shocks are suitable candidates for a common monetary policy.<sup>4</sup> In what follows, we adopt a different approach. Specifically, we estimate the New Keynesian Phillips Curves (NKPCs) for the euro area as a whole, and for a group of seven of the new member states.<sup>5</sup> The NKPC framework has a number of appealing features that distinguish it from traditional Phillips curve specifications. Unlike the traditional formulations of the Phillips curve, the NKPC is derivable explicitly from a model of optimizing behavior on the part of price setters, conditional on the assumed economic environment (e.g., monopolistic competition, constant elasticity demand curves, and randomly-arriving opportunities to adjust prices) (see [Walsh, 2003](#), pp. 263–268). In contrast to the traditional specification, in the NKPC framework current expectations of future inflation, rather than past inflation rates, shift the curve (see [Woodford, 2003](#), p. 188). Also, the NKPC implies that inflation depends on real marginal cost, and not directly on either the gap between actual output and potential output or the deviation of the current unemployment rate from the natural rate of unemployment, as is typical in the traditional Phillips curves (see [Walsh, 2003](#), p. 238).

In terms of the one-size-fits-all issue, the NKPC specification entails the following policy implications. First, most previous estimates of NKPCs have found a role for lagged inflation, in addition to current expectations of future inflation, indicating inflation persistence. The existence of inflation persistence, as represented in the lagged-inflation variable, makes the central bank's task of controlling inflation more difficult because it implies that a desired reduction of inflation can only be achieved at a considerable cost of output and/or unemployment ([Lacker and Weinberg, 2007](#), p. 221). Alternatively, if inflation is entirely forward looking, the central bank's ability to reduce inflation (without decreasing output) by reducing inflation expectations and increasing nominal interest rates is enhanced. Consequently, it would be desirable to investigate whether the inflation processes in the euro area and the new members are characterized by persistence. Our basic premise is that the role of lagged inflation in most empirical NKPCs reflects specification biases in estimation procedures.

Second, the inclusion of marginal cost in the NKPC specification permits derivations of the degrees of nominal price rigidities in economies. Specifically, by estimating the NKPCs for both the euro area and the economies of the new member states as a group, we are able to estimate the frequency of nominal price adjustments in the euro area and the new members. If the slopes of the short run Phillips curves are similar, in that the frequency of nominal price adjustments are comparable, the implication is that a one-size monetary policy may fit all — that is, both the euro area and the group comprising the new members.

Our conceptual approach is similar to that followed by [Benigno and Lopez-Salido \(2006\)](#), who estimated NKPCs for five major euro-area countries.<sup>6</sup> These authors found that inflation in Germany has a dominant forward-looking component, while in the other countries inflation shows a significant backward-looking element. A key implication of that finding is that the ECB's objective, which is an inflation rate in the Harmonized Index of Consumer Prices (HICP) of close to, but less than, 2%, may not be optimal.<sup>7</sup> In particular, if the degree of price rigidities is different among countries, then the ECB should be concerned about assigning different weights to different countries; for example, "an inflation targeting policy that assigns higher weight to countries with higher degrees of inflation persistence is beneficial for those countries since it produces lower inflation for them simply because it cares more about those inflation rates" (see [Benigno and Lopez-Salido, 2006](#), p. 609).

Our empirical approach, however, differs from that of previous authors; we use a time-varying coefficient technique that corrects for specification biases. Our findings suggest that the degree of price rigidities between the countries comprising the euro area and a group of member states is remarkably similar. As a result, changes in monetary policy in reaction to exogenous shocks will not induce dispersion in real interest rates so that a single monetary policy is appropriate.

The remainder of this paper is divided into six sections. Section 2 presents some salient facts about the newer EU member states. Section 3 describes the theoretical model underlying the NKPC and shows how the estimated coefficients can be related to the frequency of nominal price adjustment in an economy and to sufficient conditions for ECB's single monetary policy to be a good policy for both the euro area and new members. Section 4 discusses the empirical methodology and the data, and presents the results of NKPCs for the euro area and for a group of seven new member states. In common with most previous empirical studies, we use GMM estimation. Also in common with those studies, we find a significant role for lagged inflation. We also apply, however, time-varying-coefficient estimation (TVC) to both groups under consideration. The TVC procedure provides the estimates of coefficients that are corrected for specification biases so that we can assess accurately the appropriateness of lagged inflation in the NKPCs. Section 5 provides estimates of the slopes of NKPCs and of the degrees of nominal price rigidities for the euro area and for the seven new members, and discusses the policy implications of our results. Section 6 concludes.

## 2. The new EU members

As noted above, ten new countries joined the EU in 2004. The combined GDP for the year 2005 (measured in terms of euros) of these ten countries sums to around 7% of the euro area's GDP ([Table 1](#), second line). The total population of the new members is 74 million, which is about 30% of that of the euro area. As reported in [Table 1](#), the newer EU members are diverse in terms of GDP per capita (adjusted for purchasing power parity (PPP)); per capita GDP in Slovenia and Cyprus is around three-quarters of the

<sup>4</sup> [Mongelli \(2005\)](#) presented a review of this empirical work.

<sup>5</sup> As we discuss in Section 4 below, the choice of seven new EU members was dictated by data availability. These seven countries are: Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia.

<sup>6</sup> The five countries considered were France, Germany, Italy, the Netherlands and Spain.

<sup>7</sup> [Benigno and Lopez-Salido \(2006\)](#) use a welfare function in which the central bank seeks to stabilize the output gap and a weighted average of inflation rates of the countries considered.

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