



Changes in inflation dynamics under inflation targeting? Evidence from Central European countries[☆]



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ABSTRACT

Many countries have implemented inflation targeting in recent decades. At the same time, the international conditions have been favorable, so it is hard to assess to what extent the success in stabilizing inflation should be attributed to good luck and to what extent to the specific policy framework. In this paper, we provide a novel look at the dynamics of inflation under inflation targeting, focusing on three Central European (CE) countries that adopted the IT regime at similar times and in similar environments. We use the framework of the open economy New Keynesian Phillips curve (NKPC) with time-varying parameters and stochastic volatility to recover changes in price-setting and expectation formation behavior and volatility of shocks. We employ Bayesian model averaging to tackle the uncertainty in the selection of instrumental variables and to account for the possible country-specific nature of inflation dynamics. The results suggest that inflation targeting does not itself automatically trigger changes in the inflation process, and the way the framework is implemented might matter. In particular, we find rather heterogeneous evolution of intrinsic inflation persistence and volatility of inflation shocks across these countries despite the fact that all three formally introduced inflation targeting a decade ago.

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1. Introduction

Understanding the nature of short-term inflation dynamics poses a major challenge for monetary policy. Sound knowledge of inflation properties is especially pressing for countries whose economies have undergone dramatic structural changes and where the institutional settings of monetary policy have been considerably changed in order to engineer a sharp disinflation process. Taming inflation has traditionally been considered costly in terms of output loss, but a better notion of the role of expectations has given policy makers hope that credible monetary policy can achieve disinflation without having a detrimental effect on real economic activity. This concept has become a hallmark of the New Keynesian Phillips curve (NKPC).

The NKPC was proposed as a structural model of inflation dynamics which is based on an optimization process at the micro-level and thus should be invariant to policy changes. However, this claim is not fully supported by recent research. There are numerous reasons why the parameters of the NKPC model can evolve over time. Importantly, a more aggressive monetary policy stance (Davig and Doh, 2008) and the implementation of credible monetary policy regimes such as inflation targeting (Benati, 2008) have been considered key drivers in reducing inflation persistence and volatility by anchoring inflation expectations. On the contrary, cross-country panel studies such as Ball and Sheridan (2004), Mishkin and Schmidt-Hebbel (2007), and Brito and Bystedt (2010) find rather mixed evidence on the relative performance of inflation targeters vs. non-targeters in both developed and emerging countries.

The countries of Central Europe (CE) represent a unique sample for analyzing changes in inflation dynamics related to the adoption of inflation targeting and overall changes in economic conditions: the three CE countries – the Czech Republic, Hungary, and Poland – are relatively similar small open economies with a strong regional and historical affinity. They jointly underwent a transition to a market economy, which could have induced similar changes in both price-setting and expectation formation behavior. Finally, they all introduced inflation targeting as a disinflation strategy (the Czech Republic in 1998, Poland in 1999, and Hungary in 2001). On the other hand, their actual monetary policy conduct has shown notable differences, in particular in the role given to

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the exchange rate. Whereas the Czech Republic and Poland have left their currencies to float freely most of the time since launching IT and have used a few time-limited exchange rate interventions (the Czech Republic in 2002 and Poland in 2011), in Hungary the IT framework was accompanied by a target zone for the exchange rate of the forint vis-à-vis the euro. This was lifted only after several years (in 2008) and a currency crisis immediately ensued.

Under these conditions, we can run a natural experiment to assess the impact of inflation targeting and the role of country-specific modifications to the IT framework. In particular, it might be of crucial importance to evaluate the effectiveness of the specific IT implementation in each country vis-à-vis changes in the inflation process such as inflation persistence, the role of inflation expectations, and the volatility of inflation shocks. The lesson learned from this analysis may shed some light on the nature of the differences in the relative performance of inflation targeters, since inflation targeting is still the preferred monetary framework being adopted by emerging countries around the globe. If inflation dynamics were homogeneous across countries, the role of domestic policy and specific issues related to the implementation of IT would be of only minor importance. On the contrary, if one observed persistent differences in inflation dynamics despite a (formally) common monetary policy regime and common foreign shocks, this would be indirect proof that good policy still matters notwithstanding the prominent role of global factors in today's world. It should be also stressed that in contrast to many other emerging and transition economies, the CE countries' membership of the OECD and EU makes the data reliable and internationally comparable.

In this paper, we provide evidence on the evolution of inflation dynamics in the CE countries based on estimates of the New Keynesian Phillips curve. This is augmented by a number of features to suit our purposes. First, we extend the open-economy version of the NKPC proposed in Galí and Monacelli (2005) to a hybrid form and a time-varying context. Second, in relation to time-varying estimation of the NKPC we provide several methodological contributions. In our two-step procedure closely related to Kim (2006), we propose to use Bayesian model averaging (BMA) to tackle the thorny issue of instrument selection in the first step. Thanks to BMA, the instruments are allowed being country specific, reflecting, for example, differences in the expected role of foreign factors in inflation expectations. Indeed, the sensitivity of the results to the choice of the conditioning instrument set has been shown to be very relevant in forward-looking models, with the NKPC being a prominent example (see e.g. (Mavroeidis, 2005)). Third, we add a stochastic volatility model for error terms into the time-varying regression because changes in inflation volatility might induce spurious variation in the estimated coefficients, as previously documented (see e.g. Koop and Korobilis, 2009). Moreover, modeling the magnitude of inflation shocks in a time-varying manner has additional analytical merits. Since a decline in inflation volatility (along the level of inflation) is often seen as the main purpose of the IT framework and can be directly linked to the effectiveness of the policy regime, obtaining relevant information on its evolution might be highly important to policy makers.

The results can be summarized as follows. First and foremost, inflation dynamics are heterogeneous across the three CE countries despite the fact that all three national central banks pursue inflation targeting. Intrinsic inflation persistence has dropped substantially only in the Czech Republic, to currently insignificant levels. More importantly, the volatility of inflation shocks decreased quickly a few years after the adoption of inflation targeting in both the Czech Republic and Poland. By contrast, the nature of the inflation process in Hungary does not seem to have changed much over the last 15 years. Second, the inflation–output trade-off seems to be blurred by potentially important supply shocks during the transition process, and those shocks cannot be fully captured by the NKPC model analyzed. However, the results tend to reveal a non-linear relationship between domestic economic activity and inflation. Indeed, the coefficient on the output gap increases consistently only in periods when output significantly deviates from its potential. Third, similar conclusions can be drawn for

foreign inflation factors, tracked by the terms of trade. They turn significant in specific periods such as major exchange rate devaluations. Yet there is also some indication that foreign factors might already be well reflected in inflation expectations themselves. Finally, the overall changes in the inflation process reflect changes in the price-setting behavior of firms, which we detect in both the cross-country and temporal dimensions.

Our empirical findings have some noteworthy policy implications for (emerging) countries that adopt inflation targeting. Although all three CE countries officially adopted inflation targeting more than a decade ago, in two of them (Hungary and Poland) intrinsic inflation persistence has not decreased considerably and remains at a higher level than that reported for developed countries. The volatility of inflation shocks decreased quickly after the introduction of IT in the Czech Republic and Poland, but was again practically unaltered in Hungary. Therefore, it seems that the adoption of inflation targeting does not itself automatically produce any changes in the inflation process, and the particular way the framework is implemented might matter. If inflation targeting is not sufficiently credible, economic agents might mainly take into account observed inflation levels rather than the inflation target. This may arguably be related to the role of the exchange rate in monetary policy. Although inflation targeting is aimed at the domestic price level, Hungarian monetary policy has paid special attention to the exchange rate, and the exchange rate channel is considered the most efficient channel of monetary policy transmission. Our results suggest that this policy choice has itself had its costs, as the goal of stabilizing inflation expectations has not been fulfilled.

The paper is organized as follows. In Section 2, we review relevant literature. Section 3 presents our version of the open economy NKPC that is subject to empirical investigation. Section 4 describes our econometric framework and data. All the results and their interpretation appear in Section 5. The final section concludes.

2. Related literature

From the empirical perspective, the NKPC owes its growing popularity to the seminal papers of Galí and Gertler (1999) (GG hereafter) and Galí, Gertler, and López-Salido (2001, GGL). Despite the theoretical appeal of the (hybrid) NKPC, subsequent studies have produced rather conflicting empirical evidence, with the results varying across economies, data sets, and – most notably – estimation methods (e.g. Rudd and Whelan, 2005; Mavroeidis, 2005; Lindé, 2005). To account for the characteristics of small open economies Galí and Monacelli (2005) derive a small open economy version of the NKPC for CPI inflation, which in addition to marginal cost includes the terms of trade. Mihailov et al. (2011b) provide some favorable empirical evidence on this model based on data for selected OECD countries. With respect to theoretical underpinnings, it is probably the closest empirical study to our own. Alternative approaches include Batini et al. (2005), who propose an open-economy NKPC where the marginal cost is affected by import prices and external competition and conclude that this model fits the UK data well. Rumlér (2007) extends the marginal cost measure to include the cost of intermediate inputs (both domestic and imported) and finds some plausible evidence for the euro area countries.

A few recent studies consider the effects of structural changes in the economic system and monetary policy regime and explore how these are propagated into the parameters of the NKPC. Most of the evidence is available for the US. The intrinsic inflation persistence was found to be an empirical artifact driven by specification bias inherent to fixed-coefficient models (Hall et al., 2009) or to variation in the long-run inflation trend (Cogley and Sbordone, 2008). Several authors also document that the nature of the inflation process changes with the macroeconomic environment (Zhang et al., 2008) and the monetary policy regime (Cogley et al., 2010; Kang et al., 2009). However, there are also studies (Stock and Watson, 2007) claiming that inflation persistence has not changed for decades in the US.

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