



# Empirical evaluation of nominal convergence in Czech Republic, Poland and Hungary (CPH)

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## ABSTRACT

We estimate a four variable structural vector auto regression (SVAR) model of the Czech Republic, Poland and Hungary economies in order to evaluate the links between the instruments of monetary policy and inflation outcomes. We find that the linkages between the interest rates and price levels are weak. However, the exchange rate constitutes the most important channel of monetary policy transmission for Poland and Hungary. For the Czech Republic, the link between interest rate rise and price level is rather indirect.

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## 1. Introduction

This paper is concerned with the evaluation of the monetary transmission mechanisms in Central and Eastern European Countries (CEECs). These countries adopted several macroeconomic stabilization programs in order to initiate a monetary convergence towards the eurozone. In the early 1990s, they enacted the pegging exchange rates framework to minimize the difference between the domestic and the euro-area inflation rates. This was accomplished by applying a set of measures including alternative monetary and exchange rate regimes (Jonas and Mishkin, 2003; Orlowski, 2004). However, for Czech Republic, Poland and Hungary, these policies appear to have had little success in promoting sustainable price stability (Orlowski, 2003). In response to these monetary and exchange risks the CPH (Czech Republic, Poland and Hungary) adopted a strict inflation targeting and were directed towards more flexible exchange regimes (Aglietta et al., 2003; Golinelli and Rovelli, 2005).

Indeed, with the DIT, the CEECs abandoned exchange rate pegs and adopted an autonomous monetary policy based on predominant inflation targeting, combined with a conditional exchange rate

stability target. This new strategy has been in fact successful in generating sustainable prices because it is devoted solely to lowering inflation. However, it is important in any inflation targeting strategy to understand the transmission mechanism of the monetary policy shocks to inflation outcomes. Are the links between the interest rate, which is considered as the main monetary instrument, and the price level direct or do they use other channels? Ball (2002) argues that the effects of exchange rates on inflation through import prices are the fastest channel from monetary policy to inflation. A further motivation of this paper is to evaluate the role of the exchange rates to consolidate the effects of interest rates in attempting to reduce the price level. Following Blanchard and Quah (1989), Gali (1992), Cecchetti and Rich (2001), Bruneau and De Bandt (2003), Elbourne and De Haan (2005), and Jarocinski (2006), we propose an econometric analysis based on the structural VAR approach which is quite convenient to provide information on monetary policy by including forward-looking monetary policy rules, which take into account the role of the exchange rate. We try to examine how monetary shocks can induce significant bendings in CPH price level dynamics and through which channels. We find, especially for the Czech Republic, that the transmission of the interest shock on prices level decline is statistically significant and persistent.

The structure of the paper is the following: Section 2 presents an overview of the evolution of monetary policies in CPH. Section 3 discusses the methodology we use to model monetary policy and to

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identify the structural shocks in the VAR model. Section 4 reports impulse responses and variance decomposition to show the domestic contractionary monetary shock effects and their contributions to the dynamics of selected variables. Section 5 contains conclusions with some suggestions for possible further research.

## 2. Overview of monetary policies in CPH

The central banks of several European transition economies implemented over-all (??) several basic monetary regimes to ensure their macroeconomic stabilization in order to join the Economic and Monetary Union (EMU). They adopted the currency peg regimes in the early 1990s, followed by implicit targets for exchange rates. These policies represented nominal anchors for macroeconomic stabilization. Thus, the exchange rate pegs induced lowering inflation at a significant level and this exacerbated the real appreciation of domestic currencies, which led to worsening current account deficits and to attracting floating capital. The fix exchange rate was carrying financial instability and accelerating inflation. In response to these monetary and exchange risks the CPH (Czech Republic, Poland and Hungary) abandoned the exchange rate targeting regimes (at different times and in different ways) to finally adopt an inflation targeting framework with more flexible exchange rate regimes (Aglietta et al., 2003; Golinelli and Rovelli, 2005). This program reinforces commitment to contain inflation volatility in spite of Harrod–Balassa–Samuelson effect problems and international capital inflows.

The Czech Republic was the first European transition economy to implement the inflation targeting framework after abandoning a fixed exchange rate regime following turbulence in May 1997. In the early 1990s, the fixed exchange rate regime generated low and significant levels of inflation, before producing real appreciations inducing an erosion of competitiveness. The policy mix implemented by the Czech authorities contributed to higher interest rates which attracted more short-term foreign capital, keeping inflation high and widening the current account deficit to be unsustainable.

Furthermore, uncertainties in financial markets, triggered by speculative attacks, accelerated the flight of foreign investors, forcing the authorities to stop defending a fixed exchange rate. On May 26, 1997, the Czech National Bank (CNB) decided to allow the domestic currency to float freely. Accordingly, in 1998, the monetary policy changed to a strategy of inflation targeting owing to the instability of money demand.<sup>2</sup> However, during the period of inflation targeting, the CNB kept on intervening in the foreign exchange market (Frommel and Schobert, 2006). Holub (2004) argues that these interventions (in early 1998 and in 1999/2000) were not consistent with inflation targeting.

Like the Czech Republic, Poland was pegged to a basket of currencies in the early 1990s. However, inflation did not decline and the fixed nominal exchange rate led to rapid real appreciation. Therefore, a crawling peg was introduced in October 1991, although until April 2000, Poland maintained implicit target zones accompanied by crawling devaluation for the exchange rate (Jonas and Mishkin, 2003).

Nevertheless capital account liberalization led in 1994 and 1995 to large capital inflows, which constrained the authorities to widen the crawling exchange rate band in May 1996. During the period 1996–1998, the National Bank of Poland (NBP) experimented with targeting interest rates. But these alternative regimes were not really consistent with low inflation. Due to the increased integration of financial markets, Poland's transition to an inflation targeting regime began during the last quarter of 1998, although it was not announced formally until January 1, 1999. Currently, the exchange rate plays no major role in the monetary policy as the NBP does not intervene on the foreign exchange market (Frommel and Schobert, 2006).

Hungary adopted early in transition economic an exchange rate peg against the basket of currencies. However, the peg was adjusted downward quite often to maintain external competitiveness. The fluctuation band was gradually widened to reduce speculative pressures ahead of the predictable adjustments of the parity. This mechanism did not prevent large short-term capital inflows in 1994–1995. After some devaluation, the regime of ad hoc adjustment was replaced by a crawling band. Indeed, this regime succeeded in bringing inflation down below 10% in 1999 (Jonas and Mishkin, 2003).

Unlike the Czech Republic and Poland, the Hungarian authorities continued to view the narrow fluctuation band as a useful nominal anchor. The band helped to reduce inflation and anchor inflation expectations; it also avoided excessive real appreciation. However, Hungary was forced to deal with the problems caused by large capital inflows. In May 2001, the authorities finally decided to widen the fluctuation band around the parity against the Euro. The crawling peg was completely abandoned in October 2001. Before, in August 2001, the National Bank of Hungary (NBH) explained that for the next couple of years, it would be using the inflation targeting system to achieve a gradual reduction of inflation to a level corresponding to price stability. The inflation target is surrounded by a 1% tolerance band, which was applied until 2002. The Hungarian policy mix was successful in providing internal and external stabilities of the economy (Dibooglu and Kutan, 2001; and Barlow, 2005).

## 3. Theoretical foundations

There are several advantages in relying on the SVAR specification for analyzing monetary policies. In particular, it allows modelling non recursive structures of the economy and it facilitates the interpretation of the contemporaneous correlations of disturbances. Indeed, the decomposition of the variance–covariance matrix in the SVAR framework implies a recursive scheme among the variables that has clear economic implications and can be tested as any other relationship.

The SVAR methodology suggests imposing various kinds of restrictions on the structural parameters only. The basic approach derives from the studies of Blanchard and Watson (1986), Bernanke (1986), Blanchard and Quah (1989), Shapiro and Watson (1988) and Blanchard (1989) on structural modelling.

Unlike many SVAR model identification processes which define either short run (Kim and Roubini, 2000) or long run (Blanchard and Quah, 1989) restrictions, Gali (1992) and Bruneau and De Bandt (2003) favour a combination of both, in order to assess interactions between structural shocks and several economic variables on the short and long run.

Gali (1992) was the first to implement a combination of two types of restrictions. He took as starting point Blanchard and Quah (1989) and Shapiro and Watson (1988) to define permanent and transitory dynamic effects of various disturbances on economic variables. However, Gali's study (1992) was carried out in the context of a closed economy.

In this paper, we try to extend Gali's approach within a small open economy framework taking the exchange rate into account. Indeed, to analyze monetary transmission mechanisms in European Union accession countries, we propose a SVAR model including the industrial production index as a real output “proxy”, exchange rate<sup>3</sup>, consumer price index and short-term nominal interest rate for the Czech Republic, Poland and Hungary.

Formally, the VAR representation of the reduced-form model can be written as

$$(D)y_t = \varepsilon_t \quad E(\varepsilon_t \varepsilon_t') = \Omega. \quad (1)$$

<sup>2</sup> Annual reports, CNB Annual Report, 1998, p.48.

<sup>3</sup> The price of one unity of euro in domestic currency.

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