

# **Determinants of low inflation in emerging, small open economy**

## Comparison of aggregated and disaggregated approaches

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### **Extended Abstract**

After 2011 headline inflation in many countries has been decreasing excessively raising the question of the determinants of recent unexpectedly low and persistent inflation (European Central Bank, 2016). Excessive disinflation has coincided with a protracted period of an anemic recovery in many economies as well as plummeting commodity prices. The discussion on the determinants of muted inflation is mainly focused on highly developed economies (e.g. Bobeica and Jarocinski, 2016). Relatively little evidence is presented for emerging economies facing persistently low inflation. For this purpose we employ Polish data and investigate empirically the drivers of inflation in small open economy by estimating a structural vector autoregression model using Bayesian methods.

We contribute to the existing literature in two ways. Firstly, we disentangle the structural shocks influencing headline and core inflation and assess the importance of foreign and domestic, supply and demand factors in shaping inflation developments in Poland. These shocks are identified using sign restrictions following Bobeica and Jarocinski (2016) as well as Corsetti et al. (2014) identification scheme. Secondly, we extend this analysis on a large number of disaggregated inflation components to inspect whether the disaggregated approach provides a similar picture of determinants of price dynamics. Moreover, this method enables us to isolate components of inflation sensitive to changes in foreign and domestic, supply and demand factors and construct indices of inflation sensitive to the distinguished determinants. To check whether the excessive disinflation period resulted from a structural shift, we limit our sample to exclude the period of systematically falling inflation and re-estimate all models. Thirdly, we provide important evidence for monetary policy conduct in Poland about the determinants of the unravelling phenomenon of low inflation.

By and large, inflation is shaped by the convolution of the foreign and domestic, demand and supply factors. Existing empirical evidence suggests that the sensitivity of price dynamics fades with respect to changes in the domestic real activity to the advantage of global factors. On the one hand this phenomenon is exemplified by the flattening of the Phillips curves across both advanced as well as emerging economies (Matheson and Stavrev, 2013; Blanchard et al., 2015; Szafranek, 2017). On the other hand, a strand of literature ascribes this to the growing role of globalization (Borio and Filardo, 2007; Ciccarelli and Mojon, 2010). To provide an example, Borio and Filardo (2007) argue that apart from domestic factors inflation in many countries is influenced by the global demand and supply. The authors emphasize the increasing role of the external factors in shaping inflation during the last decade while observing the flattening of the Phillips curve. Moreover they suggest that exchange rate pass through becomes weaker, what proves estimates for Poland (Łyziak et al., 2014).

Fluctuations in commodity prices are undoubtedly an important source of inflation volatility. The surge of the commodity prices since the beginning of the 2000 until the outbreak of the global financial crisis has led to the elevated inflation. However, in recent years a structural change on the energy market emerged leading to the significant slump of the oil prices followed by the considerable decline of the inflation in many economies. Kilian (2009) believes that due the nature of changes in oil prices their impact on the inflation is different than that of other shocks. Bobeica and Jarocinski (2016) postulate that global oil prices coupled with weak global demand are key to understand the episode of missing disinflation. Aastveit et al. (2016) examine the influence of the global and regional factors on the main macroeconomic variables (e.g. GDP, investment, inflation, employment) for small open economies and conclude that foreign (world and regional) shocks explain ca. 50-70% of the variability of the analyzed variables in 4 analyzed countries, but when accounting for additional shock – oil shock – the variability explained is even bigger. Finally, spillovers effects from large economies, like the United States or the euro area can affect both advanced and developing economies. Moreover, the analysis indicates that the magnitude has increased in the last years (Hałka and Szafranek, 2016).

That notwithstanding, domestic conditions still to some extent influence inflation. Globan et al. (2016) find that in the short term inflation dynamic is mainly driven by the domestic conditions whereas in longer term external factors become a more important driver of the price changes in the non-Eurozone new EU members states. Bobeica and Jarocinski (2016) conclude that low inflation in the euro area should be predominantly attributed to deflationary domestic shocks coupled with weak domestic real activity. Moreover, despite the growing importance of global factors and the flattening of the Phillips curve, Szafranek (2017) concludes that the impact of domestic factors on headline and core inflation is still significant in an emerging, small open economy of Poland.

The substantial strand of empirical literature related to the propagation of global and domestic shocks into the small open economies focuses on analyses performed using aggregated data. The analysis on the disaggregated inflation is relatively scarce. However, research on the disaggregated data reveals that

not all inflation components react in the same manner. Bryan and Meyer (2010) point out that the sensitivity of individual prices may differ and that prices of certain goods and services may react to the changes in the domestic economic activity stronger than others. Frohling and Lommatzsch (2011) show that two thirds of the euro area HICP basket reacts to the changes in the domestic slack, however, the results among member states are heterogeneous – larger countries show higher share of output gap sensitive items than smaller ones.

Taking into account that disaggregated analysis may show different results than aggregated one we aim to compare results from two approaches. Firstly, we analyze the structural shocks affecting the aggregate level of inflation and we show the historical decomposition of the difference between the long-run level of inflation implied by the Bayesian SVAR model and the observed inflation decomposed into domestic and global, demand and supply shocks in the analyzed period. The structural shocks are disentangled by employing sign restriction methodology and identification strategy put forward by Corsetti et al. (2014) and Bobeica and Jarocinski (2016). Secondly, we run a similar analysis on disaggregated data for around forty main inflation components. The analysis of the shock decomposition can be divided into two periods. The first period comprised the whole sample, which also covers the disinflation period. The second one ends before inflation has begun to decrease excessively, namely 2012.

Preliminary results suggest that in the first period the domestic demand shock was a main driver of the high inflation what coincided with the high positive domestic output gap. Second source of inflation was global domestic demand due to the faster external GDP growth than the domestic one. Fading domestic demand was the dominant factor leading to a sharp decline in inflation in 2012, reducing CPI in the second and third quarter of 2013 by up to 1 pp. The deflationary period in the Polish economy remains due to the coexistence of the positive global supply and the negative demand shock. The first of these factors, attributed to the drop in the oil prices, contributed to the average decrease of the CPI by 0.6 pp. The second one, attributed to the weakening of the global economic activity, reduced inflation by an average of 0.7 percentage points. In aggregate terms, throughout the period domestic factors remain stronger determinant of price dynamics in the economy, however after the second quarter of 2014 the economy faced growing importance of global factors affecting inflation. At the beginning of disinflation period domestic supply and demand factors prevailed. On the other hand, during deflation these shocks were on average over 50% of the total deviation of the actual inflation from its long-term average. In both analyzed periods, the impact of demand shocks was similar and much larger than the impact of supply shocks.

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