Why so different from other CEECs - Poland’s cyclical divergence from the euro area during the recent financial crisis

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Why so different from other CEECs – Poland’s cyclical divergence from the euro area during the recent financial crisis

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Abstract

The aim of the article is to provide a plausible explanation for the relatively good performance of the Polish economy and the resulting cyclical divergence from the euro area during the recent financial crisis. The investigation of the factors which contributed to this divergence is particularly important in the light of Poland’s prospective accession to the euro area, as it may indicate the problem of asymmetric shocks affecting both economies or asymmetric responses to shocks. The results point out to two reasons for the differential output trajectory in Poland as compared to other CEECs: (i) lower exposure to foreign shocks being the result of a lower degree of economic openness, and (ii) resilient internal activity, which may be the result of structural characteristics of the Polish economy. The recent cyclical decoupling might, however, contribute to the acceleration of Poland’s real convergence to the euro area and consequently speed up the cyclical convergence process.

JEL classification codes: E32, C22

Keywords: business cycles synchronisation, propagation of shocks, transmission of cyclical fluctuations, real convergence

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1 Introduction

In the aftermath of the global financial crisis, triggered by the collapse of the U.S. subprime mortgage market, the global economy was hit by severe adverse shocks and consequently experienced a sharp and protracted downturn. With 1.7% y/y Poland was the only EU member state to show real GDP growth in 2009. The resilience of the Polish economy was particularly conspicuous when compared to other Central and Eastern European countries (CEECs\(^1\)), whose economies shrank to a similar extent as the EU-15. This was despite the relative underdevelopment of CEECs’ financial markets, i.e. lower exposure to the primary cause of the crisis.

What is more, the differential performance across the new EU member states during the recent slowdown was clearly at odds with the results of numerous previous studies (for the latest reference, see Fidrmuc and Korhonen 2006; Adamowicz et al. 2009; Skrzypecki 2009; Konopczak 2009; Marczewski and Konopczak 2009), according to which it was Poland whose degree of business cycle synchrony with the euro area was one of the highest among CEECs. In order to find a plausible explanation for this phenomenon, we investigate into the following areas: (1) the degree of symmetry of shocks affecting CEECs and the euro area, (2) the share of foreign impulses (originating from the euro area) in structural shocks determining the CEECs’ economic activity, (3) the propagation mechanisms of foreign shocks into the real economy. In order to get a sectoral insight we also analyse the degree of co-movement of GDP supply and expenditure components of CEECs vis-à-vis the euro area, and relate the results to the structural characteristics of the analysed economies.

The purpose of the paper is twofold. Firstly, we attempt to shed some light on economic developments in Poland and other new EU member states during the recent slowdown. Secondly, we disentangle the causes of differences in those developments within the group. We base our investigation on an eclectic approach by employing a number of tools for business cycle analysis which allows to extract and combine different kinds of information. Output gaps were extracted from the GDP and its supply and expenditure components by means of the Christiano-Fitzgerald filter (Christiano and Fitzgerald 2003). Leads and lags of the cyclical fluctuations were established on the basis of a dating algorithm developed by Harding and Pagan (2002). Structural shocks, impulse responses and variance decomposition were obtained from sVAR models on the basis of an identification scheme in the spirit of Blanchard-Quah (Blanchard and Quah 1989).

The rest of the paper is organised as follows. In Section 2 we outline econometric tools for business cycle analysis that were applied in the paper and in Section 3 we summarise the empirical results of the analysis, giving answers to the questions posed.

\(^{1}\)For the purpose of the analysis the CEECs group consists of the so-called Visegrad countries: the Czech Republic (CZ), Hungary (HU), Poland (PL) and Slovakia (SK).
2 Methodology and data

2.1 Extraction of cyclical components

In order to isolate cyclical fluctuations from the GDP series and its supply and expenditure components we applied the asymmetric Christiano-Fitzgerald filter (Christiano and Fitzgerald 2003). Its advantage over the most common band-pass alternative, i.e. the Baxter-King filter (Baxter and King 1995), is that it uses the whole time series for the calculation of the cyclical component and therefore allows to extract it at each data point. For this reason there is no loss of data at the ends of the sample, which allows for the analysis of the recent developments.

The ideal band-pass filter extracting a cyclical component $y^c_t$ from the original series $y_t$ has the following structure:

$$y^c_t = \sum_{j=-\infty}^{\infty} B_j y_{t-j} \quad t = 1, 2, \ldots, T$$

with a response function in frequency domain of:

$$B(e^{-i\omega}) = \sum_{j=-\infty}^{\infty} B_j e^{i\omega j}.$$  \hspace{1cm} (2)

The weight sequence $B_j$ that allows to isolate the oscillations of durations between $\tau_{min}$ and $\tau_{max}$ (or alternatively frequencies within the range $[\omega_{min} = \frac{2\pi}{\tau_{max}}, \omega_{max} = \frac{2\pi}{\tau_{min}}]$) takes the following form:

$$B_j = \left\{ \begin{array}{cl} \sin(\frac{2\pi j}{\tau_{max}}) - \sin(\frac{2\pi j}{\tau_{min}}) & j \neq 0 \\ \frac{2}{\tau_{max}} - \frac{2}{\tau_{min}} & j = 0 \end{array} \right.$$  \hspace{1cm} (3)

The approximation to the ideal band-pass filter proposed by Christiano and Fitzgerald (2003) can be written as:

$$\hat{y}^c_t = \sum_{j=-(T-t)}^{t-1} \hat{B}_{j,t} y_{t-j} \quad t = 1, 2, \ldots, T$$

with a frequency response function of:

$$\hat{B}(e^{-i\omega}) = \sum_{j=-(T-t)}^{t-1} \hat{B}_{j,t} e^{i\omega j}.$$  \hspace{1cm} (5)

The filter weights $\hat{B}_{j,t}$ are obtained by minimising the following loss function:
\[ Q = E[(y_t^c - \hat{y}_t^c)^2] \]  

(6)

or in the frequency domain

\[ Q = \int_{-\pi}^{\pi} |B(e^{-i\omega}) - \hat{B}(e^{-i\omega})|^2 f_y(\omega) d\omega, \]  

(7)

where \( f_y(\omega) \) is a spectral density of \( y_t \) at frequency \( \omega \). The solution to this minimisation problem depends on the characteristics of the series, i.e. its spectral density. Owing to the fact that the true representation of the process is unknown, Christiano and Fitzgerald suggest to solve the problem on the assumption that the data is generated by a random walk, which is in line with the fact that most macroeconomic series exhibit the so-called Granger spectral shape, i.e. low frequencies dominate the spectrum.

In case of non-stationarity of the series the minimisation problem is solved under the restriction that:

\[ \sum_{j=-(T-t)}^{t-1} \hat{B}_{j,t} = 0, \quad t = 1, 2, ..., T. \]  

(8)

Due to the fact that the weights vary over time, the problem is solved for each sample observation.

The optimal weights obtained from the above minimisation problem are given by the following formula:

\[ \hat{B}_{j,t} = \begin{cases} \frac{1}{2}B_0 - \sum_{k=0}^{j-1} B_k, & j = t - 1, \\ \hat{B}_j, & j = t - 2, ..., t - T + 1, \\ \frac{1}{2}B_0 - \sum_{k=j+1}^{0} B_k, & j = t - T. \end{cases} \]  

(9)

For the purpose of our analysis we chose the cut-off periodicities conforming to the Burns and Mitchell (1946) definition, i.e. \( \tau_{\min} = 6 \) quarters and \( \tau_{\max} = 32 \) quarters. Prior to being filtered, the series were subjected to the demeaning procedure, so as to improve the comparability of the cyclical components.

2.2 Turning points detection

Leads and lags of the CEECs cyclical fluctuations vis-a-vis the euro were established on the basis of a dating algorithm developed by Harding and Pagan (2002), building upon Bry and Boschan (1971).

A turning point occurs at time \( t \) if the value of a cyclical component at \( t \) (\( y_t^c \)) is a local extremum relative to the two quarters on either side. For peaks we get the following condition:
\[(y_{t-2}, y_{t-1}) < y_{t} > (y_{t+1}, y_{t+2}) \] \hspace{1cm} (10)

and similarly for troughs:
\[(y_{t-2}, y_{t-1}) > y_{t} < (y_{t+1}, y_{t+2}). \] \hspace{1cm} (11)

Additionally, the algorithm enforces a minimum duration of each phase (two quarters) and a complete cycle (five quarters), and ensures that peaks and troughs alternate.

### 2.3 Extraction of structural shocks

#### 2.3.1 Supply, demand and nominal shocks

In order to extract the underlying structural shocks affecting economies we follow the Clarida and Gali (1994) framework based, on the one hand, on the Obstfeld (1985) open macro model and, on the other hand, on the empirical approach pioneered by Blanchard and Quah (1989).

The structure of the economy is represented by the following trivariate VAR(s) model:

\[
\Delta y_t = -\gamma_{12} \Delta q_t - \gamma_{13} \Delta p_t + \sum_{s=1}^{s} \beta_{yy}^i \Delta y_{t-i} + \sum_{s=1}^{s} \beta_{yq}^i \Delta q_{t-i} + \sum_{s=1}^{s} \beta_{yp}^i \Delta p_{t-i} + \varepsilon_{yt} \\
\Delta q_t = -\gamma_{21} \Delta y_t - \gamma_{23} \Delta p_t + \sum_{s=1}^{s} \beta_{qy}^i \Delta y_{t-i} + \sum_{s=1}^{s} \beta_{qq}^i \Delta q_{t-i} + \sum_{s=1}^{s} \beta_{qp}^i \Delta p_{t-i} + \varepsilon_{qt} \\
\Delta p_t = -\gamma_{31} \Delta y_t - \gamma_{32} \Delta q_t + \sum_{s=1}^{s} \beta_{py}^i \Delta y_{t-i} + \sum_{s=1}^{s} \beta_{pq}^i \Delta q_{t-i} + \sum_{s=1}^{s} \beta_{pp}^i \Delta p_{t-i} + \varepsilon_{pt}, \] \hspace{1cm} (12)

where \(y_t\) denotes real GDP, \(q_t\) - real effective exchange rate (REER\(^2\)), \(p_t\) - index of consumer prices (CPI) and \(\varepsilon_{yt}, \varepsilon_{qt}, \varepsilon_{pt}\) are interpreted as structural innovations (zero-mean and uncorrelated), supply, real demand and nominal demand, respectively. All variables are assumed to be generated by I(1) processes.

The equation (12) takes the following matrix form:

\[
\begin{bmatrix}
1 & \gamma_{12} & \gamma_{13} \\
\gamma_{21} & 1 & \gamma_{23} \\
\gamma_{31} & \gamma_{32} & 1
\end{bmatrix}
\begin{bmatrix}
\Delta y_t \\
\Delta q_t \\
\Delta p_t
\end{bmatrix}
=
\begin{bmatrix}
B_{yy}(L) & B_{yq}(L) & B_{yp}(L) \\
B_{qy}(L) & B_{qq}(L) & B_{qp}(L) \\
B_{py}(L) & B_{pq}(L) & B_{pp}(L)
\end{bmatrix}
\begin{bmatrix}
\Delta y_t \\
\Delta q_t \\
\Delta p_t
\end{bmatrix}
+
\begin{bmatrix}
\varepsilon_{yt} \\
\varepsilon_{qt} \\
\varepsilon_{pt}
\end{bmatrix}, \] \hspace{1cm} (13)

or

\[
\Gamma Y_t = B(L)Y_t + \varepsilon_t, \] \hspace{1cm} (14)

\(^2\text{REER is CPI-deflated.}\)
where $B(L)$ represents a matrix of lag polynomials of order $s$.

Owing to the simultaneity bias, the model is estimated in the reduced form and the structural parameters and shocks are recovered from these estimates on the basis of an identification scheme.

Assuming the invertibility of $\Gamma$ matrix we can solve (14) for $Y_t$:

$$Y_t = \Gamma^{-1}B(L)Y_t + \Gamma^{-1}\varepsilon_t,$$

which yields the reduced-form VAR model:

$$Y_t = A(L)Y_t + e_t,$$

where $A(L) = \Gamma^{-1}B(L)$ and $e_t = \Gamma^{-1}\varepsilon_t$.

The moving average representation of the process can be derived as follows (stationarity condition satisfied owing to first order integration of level variables):

$$Y_t = (I - A(L))Y_t = e_t$$
$$Y_t = (I - A(L))^{-1}e_t$$
$$Y_t = (I + A(L) + A(L)^2 + ...)e_t$$
$$Y_t = e_t + C_1e_{t-1} + C_2e_{t-2} + ...$$

Reduced-form residuals are linear combinations of structural innovations, since $e_t = \Gamma^{-1}\varepsilon_t$. By substituting this into the above we arrive at the structural moving average representation:

$$Y_t = \sum_{i=0}^{\infty} D_i\varepsilon_{t-i},$$

where $D_i = C_i\Gamma^{-1}$.

The elements of $D_i$ matrix represent impulse response parameters of the endogenous variables to structural innovations at lag $i$:

$$\begin{bmatrix}
\Delta y_t \\
\Delta q_t \\
\Delta p_t 
\end{bmatrix} = \sum_{i=0}^{\infty} \begin{bmatrix}
d_{11i} & d_{12i} & d_{13i} \\
d_{21i} & d_{22i} & d_{23i} \\
d_{31i} & d_{32i} & d_{33i}
\end{bmatrix} \begin{bmatrix}
\varepsilon_{yt-i} \\
\varepsilon_{qt-i} \\
\varepsilon_{pt-i}
\end{bmatrix}.$$

The Blanchard-Quah approach consists in imposing restrictions on the long-run multipliers of the model (apart from orthogonality and unit-variance of structural innovations). Conforming to the implications of the Obstfeld model, Clarida and Gali (1994) propose the following identifying restrictions: (i) in the long run the real GDP can be affected only by supply shocks, (ii) in the long run REER can be influenced
by both supply and real demand shocks, but not by nominal demand shocks. This requires the following zero-constraints on the cumulative impact of shocks:

$$\sum_{i=0}^{\infty} D_i = \begin{bmatrix} d_{11} & d_{12} & d_{13} \\ d_{21} & d_{22} & d_{23} \\ d_{31} & d_{32} & d_{33} \end{bmatrix} = \begin{bmatrix} . & 0 & 0 \\ . & . & 0 \\ . & . & . \end{bmatrix}. \quad (20)$$

### 2.3.2 External and country-specific shocks

In similar fashion, the internal and external shocks for each CEEC were derived from a four-variable VAR model with the growth rate of GDP and consumer price index, at both domestic and the euro area level, as endogenous variables. The structural moving average representation of the model takes the following form:

$$\begin{bmatrix} \Delta y_{i \text{CEEC}}^C \\ \Delta y_{i \text{CEEC}}^A \\ \Delta y_{i \text{Euro area}}^A \\ \Delta p_{i \text{CEEC}}^C \\ \Delta p_{i \text{Euro area}}^C \end{bmatrix} = \sum_{i=0}^{\infty} \begin{bmatrix} d_{11i} & d_{12i} & d_{13i} & d_{14i} \\ d_{21i} & d_{22i} & d_{23i} & d_{24i} \\ d_{31i} & d_{32i} & d_{33i} & d_{34i} \\ d_{41i} & d_{42i} & d_{43i} & d_{44i} \end{bmatrix} \begin{bmatrix} \varepsilon_{y_{i \text{CEEC}}^C}^E \\ \varepsilon_{y_{i \text{Euro area}}^A}^E \\ \varepsilon_{y_{i \text{Euro area}}^C}^E \\ \varepsilon_{p_{i \text{CEEC}}^C}^E \\ \varepsilon_{p_{i \text{Euro area}}^C}^E \end{bmatrix}. \quad (21)$$

In the spirit of the Blanchard-Quah identification scheme it is assumed that demand shocks do not affect GDP in the long run and additionally that the CEECs’ country-specific shocks cannot determine the euro area variables.

This translates into the following zero-restrictions:

$$\sum_{i=0}^{\infty} D_i = \begin{bmatrix} d_{11} & d_{12} & d_{13} & d_{14} \\ d_{21} & d_{22} & d_{23} & d_{24} \\ d_{31} & d_{32} & d_{33} & d_{34} \\ d_{41} & d_{42} & d_{43} & d_{44} \end{bmatrix} = \begin{bmatrix} . & 0 & 0 & 0 \\ . & . & 0 & 0 \\ . & . & . & 0 \\ . & . & . & . \end{bmatrix}. \quad (22)$$

### 2.4 Structural disparity index

As a measure of differences in economic structures of the CEECs vis-a-vis the euro area we used the Landesmann index (Landesmann and Székely, 1995). The index is calculated according to the following formula:

$$S_{CEECj}^L = \sqrt{\frac{\sum_{i=1}^{n} (s_{i \text{CEECj}}^j - s_{i \text{EA}}^j)^2 (s_{CEECj}^j/100)}{}}. \quad (23)$$

where $s^i$ stands for the percentage share of $i$th category in the structure.
The index takes values between 0 and 1. The lower the value, the smaller the disparities in economic structures.

2.5 Data source

The data used in the analysis come from the Eurostat database. The sample covers the quarterly data from the first quarter of 1995 (for the Czech Republic: from the beginning of 1998) to the first quarter of 2010. All series were seasonally adjusted using the TRAMO/SEATS procedure. Unreported results regarding stationarity testing and models’ specification are available from authors on request.

The economic structures were defined on the basis of the following statistical classifications: (i) NACE (6 branches) for value added, (ii) COICOP (10 groups of products and services) for private consumption, (iii) CPA (6 groups of fixed assets) for investments, (iv) BEC (19 basic categories aggregated into capital, consumption and intermediate goods) for exports and imports.

3 Empirical results

In this section we make a detailed insight into the output developments during the recent downturn, prompted by a global financial shock, i.e. we analyze trajectories of business cycles and shocks affecting economies, composition of shocks by their origin, propagation mechanisms of shocks into real economy and sectoral economic performance. On this basis we attempt to find plausible explanations for the differential performance across the new EU member states in that period.

3.1 Economic performance during the financial crisis

Two potential reasons for the relative resilience of the Polish economy compared to other CEECs seem plausible: (i) the difference in the propagation mechanism of foreign shocks into the domestic economy that would manifest itself in lags in the business cycle or (ii) internal factors, e.g. the policy reactions or structural characteristics.

The onset of the recent contraction phase (i.e. the recent peak) of the Polish business cycle coincided with the euro area (Figure 1). The same situation was to be observed in the Czech Republic, whereas in Hungary and Slovakia the peak of the cycle appeared with a one-quarter lag. Therefore the relatively good performance of the Polish economy cannot to be attributed to lags in the transmission mechanism, i.e. to a phase shift compared to other CEECs.
The depth, duration and consequently steepness of the downturn were the factors that distinguished the Polish cycle. The deviation from the trend in the case of Poland amounted to merely 1 percentage point, whereas in the other new EU member states it amounted to 3-4 percentage points – even more than in the euro area, despite a lower direct exposure to the financial turmoil. What is more, the upturn of the Polish cycle appeared a quarter before it appeared in any of the other analysed countries.

Figure 1: Cyclical components of (log) GDP

(a) Poland and the euro area
(b) the Czech Republic and the euro area
(c) Hungary and the euro area
(d) Slovakia and the euro area

Note: Turning points are flagged by vertical lines (black for the euro area, coloured for CEECs).

In order to get a detailed insight into differential output developments we proceed to analyzing the trajectories of structural shocks affecting the economies during the crisis.

In the second half of 2008 the economy of the euro area was hit by massive adverse shocks (amounting to 2 to 3 standard deviations) – both supply, real demand and nominal demand (Figure 2). Poland was also subject
to negative supply shocks, but of a much smaller magnitude. In the case of real demand shocks, i.e. the preference shocks relative to the “rest-of-the-world”, Poland was hit to a similar extent as the euro area, which manifested itself in a massive nominal depreciation of the Polish zloty reflected in the real depreciation of the similar size. As regards nominal demand shocks, at the end of 2008 both Poland and the euro area underwent a period of monetary policy loosening in response to the financial turmoil. However, the outcome of this action in terms of the actual nominal shocks affecting both economies was different. Namely, the monetary easing didn’t prevent strongly negative price shocks in the euro area, proving to be insufficient in terms of output stabilisation. In Poland, in turn, nominal shocks in that period were positive. In international competitiveness terms it can be argued that the strong nominal depreciation of the Polish zloty, despite positive price adjustments, created a sufficient cushion against the external shock, which was not a case for the mainly price adjustments which occurred in the euro area.

The observed divergence between Poland and the euro area in the case of supply and nominal shocks stands in stark contrast to the trajectory of these shocks prior to the crisis. Until the end of 2007 Poland exhibited the highest degree of symmetry in this respect with the euro area of all the Visegrad countries. Consistent with the above descriptive analysis, the recursive correlation coefficients of the Polish supply and nominal shocks vis-a-vis the euro area fell dramatically during the recent downturn, contrary to the situation in other CEECs. The degree of symmetry of supply and nominal shocks with the euro area in those countries increased considerably in the crisis period, which can clearly be attributed to the transmission effect. All the analysed economies were subject to adverse real demand shocks, which can be related to the global capital flight from the emerging countries.
Figure 2: Structural shocks (identified on the basis of a trivariate VAR (GDP, REER, CPI))

(a) supply shocks  (b) real demand shocks  (c) nominal demand shocks

(i) time series of identified shocks

(ii) recursive correlation coefficients with the euro area

Note: Correlation coefficients were computed in rolling windows of fixed length (9 years) starting from the first quarter of 1995.

On the basis of the extracted structural shocks we cannot however distinguish transmission of shocks from the so-called ‘net’ synchrony of shocks, that is the synchrony of internal economic activity obtained when controlling for transmission effects. For this reason we proceed to another identification scheme which allows to distinguish structural shocks on the basis of their origin, i.e. whether they originate home or abroad.

As can be seen in Figure 3, negative structural shocks in Poland can be entirely attributed to the transmission mechanism – internal shocks that affected the economy in the midst of the financial crisis were highly positive, and negative impulses that occurred later on were of a minor magnitude. This resulted in the decrease in correlation coefficients of internal shocks with the euro area overall impulses. Contrary to the case of Poland, negative overall impulses in other CEECs can be attributed not only to transmission mechanisms, but also to their internal activity developments. It seems that the recession experienced by those countries were not only the result of contagion, but also of internal mechanisms.
Figure 3: Structural shocks (identified on the basis of a four-variable VAR (with GDP and CPI in the euro area and each country’s counterparts)

(a) supply shocks

(b) demand shocks

(i) time series of shocks (Polish internal, Polish overall, euro area overall)

(ii) recursive correlation coefficients of internal shocks with euro area overall shocks

Note: The overall shocks were extracted from a two-variable VAR (GDP, CPI) model by applying a standard Blanchard-Quah decomposition. Correlation coefficients were computed in rolling windows of fixed length (9 years) starting from the first quarter of 1995.

To sum up, the analysis of structural shocks that hit the considered economies in the aftermath of the recent financial crisis revealed that the resilience of internal activity was the factor that distinguished Poland from other CEECs. Namely, country-specific shocks were highly positive in Poland in that period, contrary to other new EU member states, though Poland was hit to a similar extent by the slump in international trade. In the next subsection we try to pinpoint those characteristics of the Polish economy that might have cushioned the impact of adverse global shocks.
3.2 Plausible explanations

The severity of the recent downturn was in the case of Poland considerably lower than in other Visegrad countries, which can be attributed to its relatively resilient internal activity. In this section we attempt to examine different characteristics of the considered countries in order to find possible explanations for this phenomenon.

First of all, it can be assumed that the recent crisis was exogenous from the perspective of developing and emerging economies, i.e. was transmitted from the advanced countries. That is why the exposure of an economy to foreign shocks should play a key role in determining the evolution of the business cycle in that period.

The share of euro area shocks in structural impulses determining the output in Poland has been by far the lowest of all the CEECs (Figure 4). This applies in particular to the euro area demand shocks, and can be related to the degree of openness and the size of the domestic market of the analysed economies. What is more, the exposure of the Polish economy to shocks originating in the euro area did not change during the recent downturn, contrary to other Visegrad countries. The observed rise in susceptibility of the Czech Republic, Hungary and Slovakia to foreign shocks at the end of the sample might explain the considerable convergence of their business cycles vis-a-vis the euro area (as measured by recursive correlation coefficients) in that period.
Figure 4: CEECs GDP forecast error variance decomposition (on the basis of a 4-variable VAR with GDP and CPI in the euro area and their CEECs counterparts)

Note: The decompositions were obtained from four-variable VAR models estimated in fixed starting-point windows (the first subsample being the first quarter of 1995 to the first quarter of 2004). The results for each subsample are flagged with the last observation.

Apart from different exposure to foreign impulses, the propagation of those shocks into the domestic economy may also explain the variation of economic performance among the CEECs. The impulse response of GDP to euro area shocks is notably different in the considered economies (Figure 5). The reaction of the output in Hungary by far surpasses the reaction in other countries. Poland and the Czech Republic, on the other hand, seem to be least reactive to the developments in the euro area. These two factors combined, that is much lower exposure and much lower responsiveness, could have made the transmission mechanism in Poland much weaker than in other CEECs.
Figure 5: CEECs’ GDP’s cumulative response to euro area shocks (on the basis of a four-variable VAR with GDP and CPI in the euro area and their CEECs counterparts)

The investigation into the sectoral developments in the CEECs, compared to the euro area, might also shed some light on the reasons of differential output trajectories. The evolution of Polish cyclical components in some sectors did not differ from other CEECs, nor the euro area; in some sectors, however, Poland exhibited a disparate behaviour (Figure 6). It seems that this outcome was not a coincidence and can be related to structural characteristics of the analysed economies.
On the expenditure side the relatively good performance of the Polish economy can be mainly attributed to private consumption developments. Firstly, the onset of the contraction phase in the Polish consumption lagged behind the peak of the euro area consumption cycle by four quarters. Secondly, the depth of the downturn was much lower: Poland did not experience negative deviations from the trend during the recent crisis. A mild slowdown could also be observed in the Czech Republic, however, similarly to Slovakia and Hungary and contrary to Poland, the synchrony of the cyclical component with the euro area increased considerably at the end of the sample (being the result of a quicker response to the euro area contraction than in the previous period), which points to the transmission of shocks. No sign of convergence of the Polish private consumption cycle vis-a-vis the euro area during the recent crisis suggests that the consumers’ behaviour in Poland did not react to the global crisis. This result is also consistent with the trajectory of the extracted nominal demand shocks, which indicates that – unlike in other countries – the Polish internal demand (primarily consumption owing to CPI inflation being a proxy for price developments) reacted positively to monetary and fiscal easing. The latter one was embodied in significant cuts in social security contributions and the personal income tax rates enacted in 2007, but effective since 2008 and 2009 respectively.
This phenomenon can be also tracked down to the structure of the consumption expenditures in Poland, compared to other considered economies (Figure 7). Despite considerable convergence that has taken place in this respect since the 90s, Poland has the most dissimilar consumption patterns vis-a-vis the euro area, as measured by the Landesmann index (together with Hungary). The share of inelastic expenditure (food and beverages, as well as housing, water, electricity and gas) in the overall consumption basket in Poland is the highest of all CEECs (approximately 5 percentage points higher than in other Visegrad countries, and as much as 12 percentage points higher than in the euro area). The share of “dispensable” expenditure (on restaurants and hotels, as well as recreation and culture) is, on the other hand, the lowest (5 percentage points lower than on average in other CEECs and 7 percentage points lower than in the euro area). Therefore, the structure of private consumption might have buffered the impact of adverse global shocks on the Polish household demand.

Figure 7: Structure of private consumption

(a) structure in 2008

(b) Landesmann index
Contrary to consumption developments, the investment demand in Poland fell to a similar extent as in the euro area. What is more, until the first quarter of 2010 there were no signs of recovery in this respect. Oddly enough, this was despite the highest (together with Slovakia, which also experienced a sharp fall) share of the so-called other construction works, which comprises mainly public investment in infrastructure, fairly resilient to unfavourable macroeconomic conditions (Figure 8). This indicates a risk-averse approach to investing, mainly in machinery and transport equipment, exhibited by entrepreneurs in reaction to the financial crisis. These decisions could possibly be underpinned by a higher share of FDI in the aggregate investments in Poland, as compared to the euro area, and a sharp fall of FDI inflows during the financial crisis.

In reaction to the global collapse of trade in the aftermath of the crisis, Poland’s exports fell to a similar extent as in the euro area. Owing to a high degree of their openness, other CEECs experienced even deeper slump. Poland’s imports, on the other hand, fell dramatically in 2009 (the maximum deviation from trend amounted to almost 15 percentage points, whereas in the euro area merely to 10 percentage points). This phenomenon
can also be tracked down to the structure of trade in the analysed countries (Figure 9). In the case of the euro area and the Czech Republic the composition of exports and imports is fairly symmetrical. Consequently, the deviation of their imports and exports from the trend were of similar magnitude. In Poland and Slovakia, on the other hand, the share of capital goods in imports is much higher and of consumption goods – much lower than in exports. Private consumption is in general much less volatile than investment (likewise, during the recent downturn the deviation from the trend in the analysed countries was much higher in the case of investment demand than consumption expenditure). Therefore the structural disparity of exports and imports could explain much higher depth of imports’ slump in Poland\(^3\). In Slovakia, however, such divergence did not take place. This outcome could be, in turn, explained by the composition of consumption goods exports in both countries (Figure 10). The share of durable consumer goods in Slovak exports is much higher than in Poland. In the case of non-durable goods the situation is the opposite. That is why the foreign demand for Polish consumer goods is much less susceptible to unfavourable economic developments than in Slovakia.

\(^3\) An immediate and strong reduction of imports of the second-hand passenger cars due to the zloty depreciation should be considered as additional factor contributing to this slump.
Figure 9: The cyclical components of exports and imports and economic structures in 2008

(a) the euro area

(b) Poland

(c) the Czech Republic

(d) Slovakia

Note: The structure for Hungary could not be computed due to incomplete data.
The trajectory of the supply side components of GDP are in line with the previous findings, according to which the relatively good performance of the Polish economy is the result of the dichotomy in the cyclical behaviour of externally-exposed (exports and investments) and internal (consumption) economic activity. Namely, the industrial sector seems to have been the only one severely affected by the recent global crisis. However the depth of the slump was much lower as compared to other analysed countries. Market services and construction sector, on the other hand, proved to be fairly resilient to the crisis. This is the reflection of the fact that services account for a large proportion of private consumption, whereas the downturn in construction building was offset by a high proportion of public investments, fuelled by EU structural funds.

The composition of GDP (Figure 11) together with the sectoral evolution of the business cycle may also explain differences in cyclical behaviour across CEECs. Namely, the share of industry in Poland is the lowest, whereas that of non-financial market services (especially trade) – the highest among the Visegrad countries. Public services resilience, the sector having second highest (after Hungary) share in the GDP, was also an important output stabilizing factor. Taking into account the difference in the susceptibility of these sectors to foreign shocks, structural disparities may to some extent stand behind the differential performance of the analysed countries during the recent crisis.
4 Conclusions

In conclusion, the differential output trajectory in Poland and other CEECs can be ascribed to three major factors: (i) lower share of internationally-driven components (manufacturing, exports) in GDP and consequently lower responsiveness of output to foreign shocks and lower share of those shocks in structural impulses, (ii) the structural characteristics of internal activities, and (iii) specific policy reactions (floating exchange rate, fiscal and monetary easing). The first and last factor have for long been recognised in the discussion on the sources of variation of economic activity within the CEEC group. The second one, however, is an important contribution of this paper. It seems, namely, that domestically-oriented sectors (market services and construction), as well as consumption demand in all CEECs except for Poland experienced a considerable convergence towards euro area developments in the aftermath of the crisis. This may indicate an increase in the interdependency (risk sharing) between those countries and the euro area. Poland, on the other hand, experienced a notably different trajectory of internal shocks and, consequently, internal economic activity.
This outcome suggests that Poland’s relatively high degree of synchronisation with the euro area may diminish, which may negatively influence the balance of costs and benefits of euro adoption. On the other hand, the relative structural characteristics of the Polish economy may change as a result of a disparate cyclical behaviour, as compared to the euro area. The consumption patterns are to a great extent the reflection of the level of disposable income of consumers. Therefore, in consequence of the acceleration of real convergence process (in terms of GDP per capita) of the Polish economy during the recent crisis, the disparity of consumption patterns relative to the euro area may also shrink. This could make Poland’s output more volatile, but at the same time it may contribute to cyclical convergence and consequently allow Poland to fully enjoy the benefits of the prospective accession to the euro area.
References


