



ECFIN COUNTRY FOCUS

Highlights in this issue:

- While on the whole not different from mature economies, the properties of the business cycle in Poland display some special characteristics
- The current cycle seems to have reached a peak but the slowdown is likely not to be as pronounced as in the previous cycle



Identification of direction and timing is key in business cycle analysis

The business cycle in Poland: where do we stand?

By Michał Narożny*

Summary

This Country Focus analyses and interprets the statistical characteristics of the Polish business cycle. It also identifies leading and lagging variables and shows that the economic fluctuations in Poland differ to some extent from those in other emerging and mature economies, with Polish growth notably more volatile and government expenditure highly erratic.

The available data on GDP growth suggest that the Polish economy is approaching the peak of the second business cycle since the start of economic transformation from a centrally planned to a market economy. The current upswing is to some extent similar to the one of 1995-1997 which ended in large macroeconomic imbalances (increasing unemployment, spare capacity, widening fiscal and current account deficits). However, Poland now appears to be better positioned than after the last cycle and should be able to avoid a repeat of that outcome.

Business cycles in emerging market economies

Although the economic literature on business cycles is vast, only recently have some papers on business cycles in emerging market economies appeared. Usually they analyse economic fluctuations within particular countries (e.g. Benczur and Ralfai, 2005) or make some cross-country comparisons (e.g. Aguayo et al., 2004 or Carmignani, 2005).

A common methodology used in the analysis of business cycles (based on observations of mature economies and economic theory) distinguishes pro-cyclical, counter-cyclical and a-cyclical variables. Pro-cyclical variables fluctuate together with GDP (e.g. industrial production, investment, employment, inflation), counter-cyclical variables against GDP (e.g. unemployment, net exports) and a-cyclical variables independently of GDP (e.g. real interest rates).¹

With respect to timing, the 'stylised facts' of the business cycle identify leading, lagging and coincident variables: leading variables move ahead of GDP (e.g. average labour productivity, inventory investment, money supply), lagging variables follow GDP (e.g. inflation, nominal interest rates) and coincident variables, as the name suggests, move coincidentally with GDP (e.g. industrial production, consumption, employment) (Snowdon & Vane, 2005, p.306).

Overall, business cycles in emerging market economies (Carmignani, 2005)² are not much different from those in mature economies (Snowdon and Vane, 2005, p. 306),

* Directorate for the Economies of the Member States.

but economies in transition (though they do not constitute a homogeneous group) display some specific characteristics:

- overall, the economy is much more volatile than in the euro area, which is the consequence of structural changes and catching-up,
- shocks are slightly less persistent than in the euro area, and fluctuations consequently more frequent,
- government consumption is more erratic than in the euro area, suggesting a significant discretionary element in fiscal policies, but not one that is necessarily aimed at cyclical stabilisation,
- employment is a-cyclical in some, but pro-cyclical in other emerging economies,
- inflation in emerging economies is volatile and not clearly pro-cyclical.

Table 1 shows some tentative analysis of the key macroeconomic variables in the Polish business cycle. All variables (except for inflation and net exports) were log-transformed, de-seasonalised by means of the X.12 method and later de-trended using the HP filter. Net exports were expressed as a ratio to GDP and de-seasonalised by means of the multiplicative X.11 method before being de-trended. Volatility of cyclical fluctuations, and hence the magnitude of the business cycle, is measured by the standard deviation. Polish GDP volatility is about 0.015, compared to 0.008 for the euro area. The persistence of cyclical fluctuations is measured by the auto-correlation coefficient: the closer to 1, the more persistent the shock (and the longer it takes to absorb it) and therefore the less fluctuation in the business cycle. Testing for the Polish business cycle persistence yields a coefficient of 0.55 compared to 0.85 for the euro area.

Business fluctuations in Poland are highly volatile and persistent

Table 1. Summary statistics of business cycle fluctuations in Poland

Poland	Summary statistics		Correlations with the cyclical component of GDP											
	Standard deviation	Auto-correlation	Lags				Leads							
			-4	-3	-2	-1	0	1	2	3	4			
GDP	0.015	0.550						1						
Industrial production	3.317	0.730	-0.018	0.154	0.314	0.515	0.771	0.599	0.444	0.229	0.113			
Private consumption	0.013	0.269	0.015	0.079	0.283	0.433	0.434	0.385	0.463	0.380	0.037			
Government consumption	0.020	0.001	-0.200	0.007	0.230	0.022	-0.211	0.175	0.282	0.199	0.051			
GFCF	0.070	0.717	0.357	0.399	0.403	0.484	0.824	0.585	0.371	0.313	0.344			
Inventories	1.189	-0.072	-0.139	0.044	0.021	0.074	0.199	0.187	0.150	0.177	0.230			
Net exports	0.012	0.574	-0.061	-0.174	-0.386	-0.373	-0.326	-0.513	-0.497	-0.389	-0.452			
Exports	0.058	-0.005	0.098	0.199	0.177	0.225	0.594	-0.018	0.030	-0.016	-0.193			
Imports	0.063	0.378	0.097	0.252	0.350	0.408	0.672	0.377	0.384	0.258	0.175			
Employment	0.017	0.857	0.291	0.372	0.411	0.452	0.545	0.409	0.333	0.355	0.344			
Labour productivity	0.354	0.512	0.120	0.090	0.056	0.070	0.133	0.257	0.109	0.026	-0.142			
Money supply (M1)	0.041	0.776	-0.078	-0.060	0.092	0.260	0.475	0.472	0.535	0.505	0.432			
Inflation	1.819	0.779	0.092	0.321	0.511	0.596	0.473	0.290	0.082	-0.082	-0.146			
CPI	1.737	0.777	0.086	0.255	0.411	0.422	0.300	0.082	-0.075	-0.167	-0.184			
Real interest rate	0.655	0.942	0.226	0.279	0.302	0.263	0.135	0.132	0.120	0.092	0.088			

Source: Own estimates. Data source: Eurostat. Sample: 1995Q3 - 2007Q1

Business cycles in Poland – what is different and what is alike

The Polish business cycle displays some characteristic properties

The analysis of the Polish cycle yields a number stylised facts, which are to some degree typical for emerging economies. Table 2 summarises a number of stylised facts on business cycles in mature economies and in Poland (bearing in mind the relatively short time span for the latter). It shows that some of the usual characteristics of business cycles in mature economies (or even in emerging economies) are not seen in Poland. Where this is the case, some interpretation is offered.

Industrial production is usually pro-cyclical and coincident in both mature and emerging economies, but in Poland it has a slightly leading property, which indicates the importance of industrial production as a driver of the business cycle.

In the aggregate demand components, *private consumption* seems to be pro-cyclical in Poland. However, it is not coincident as in mature economies, and has a lead-lag profile that is not typical: it is almost flat over four quarters with some lead. Hence, although private consumption is the largest component of GDP, the dynamic relation over time between the two variables is erratic, possibly indicating consumption smoothing, which is characteristic of low-income economies. However, the ratio of the standard deviation of private consumption to the standard deviation of GDP (by which consumption smoothing is usually judged) is estimated at 0.88, i.e. higher than the upper bound of the normal range reported in the literature.³ This suggests that consumption smoothing is not present in Poland, which might indicate lower risk aversion and/or underdevelopment of financial markets.

Table 2. The 'stylised facts' about business cycles in mature economies and Poland

Variable category	Variable	Mature economies*		Poland**	
		Direction	Timing	Direction	Timing
Supply side	Industrial production	pro-cyclical	coincident	pro-cyclical	coincident/leading
	Private consumption	pro-cyclical	coincident	pro-cyclical	erratic
Demand components	Government consumption	pro-cyclical	erratic	counter-cyclical/erratic	erratic
	GFCF	pro-cyclical	coincident	pro-cyclical	coincident
	Inventories	pro-cyclical	leading	pro-cyclical	leading
	Net exports	counter-cyclical	coincident/ lagging	counter-cyclical	erratic
	Exports	pro-cyclical	coincident	pro-cyclical	coincident
	Imports	pro-cyclical	coincident	pro-cyclical	coincident
	Labour market	Employment	pro-cyclical	coincident	pro-cyclical
Labour productivity		pro-cyclical	leading	pro-cyclical	leading
Monetary variables	Money supply	pro-cyclical	leading	pro-cyclical	leading
	Inflation	pro-cyclical	lagging	pro-cyclical	lagging
	Real interest rates	a-cyclical	erratic	pro-cyclical	lagging

* Features commonly found in the literature. Main source: Snowdon & Vane (2005)
** See Table 1

Source: Own calculations (see Table 1) and Snowdon & Vane (2005)

The irregular pattern of government consumption suggests that discretionary fiscal policies play an important role

Government consumption seems to be neither systematically counter- nor pro-cyclical. High volatility and a very low persistence (i.e. frequent fluctuations of sizeable magnitude) point to an irregular pattern of government consumption, suggesting an important role of discretionary fiscal policies, which is a distinctive feature of emerging economies (Carmignani, 2005) and possibly related to the existence of a political cycle in public finances.

Gross fixed capital formation appears to be coincident, highly pro-cyclical and persistent (auto-correlation of 0.72) and *inventories* behave according to the 'stylised facts': they are pro-cyclical and leading (though less so than in mature economies).

Finally, both *exports* and *imports* can be seen as pro-cyclical, but imports slightly more so than exports, which is in line with the features of mature, but not emerging economies where exports are a-cyclical on average. Moreover, imports seem to be quite persistent (following persistent GFCF), unlike exports (which depend on external demand); both variables are highly volatile (standard deviations are more than the double of the euro-area). *Net exports* are moderately counter-cyclical with an erratic pattern over time (due to persistent imports), whereas in mature economies net exports are also counter-cyclical, but usually coincident or lagging.

Smooth and lagged correlation profile of pro-cyclical employment suggests labour hoarding

With respect to the labour market, *employment* shows up as pro-cyclical and coincident, with some evidence of lagging, which places Poland somewhere in the middle between mature and emerging economies in this respect. *Labour productivity* appears to be pro-cyclical and leading, in line with the 'stylised facts', though the leading property is less pronounced than in mature economies. Pro-cyclicity of employment with its smooth and slightly lagged correlation profile suggests labour hoarding (Burnside et al., 1993).

Among the monetary variables, the *money supply* appears to be pro-cyclical and leading. *Inflation* seems to be pro-cyclical and to follow GDP as in mature economies, which is not the case in most emerging economies (where inflation is a-cyclical – see Carmignani, 2005). This is probably due to the fact that at the beginning of the transformation process all emerging economies had very high inflation rates that systematically decreased. Thus, it is hard to discern a clear cyclical pattern. Poland managed to achieve relatively low inflation sooner than other emerging countries, allowing this pro-cyclicity to be revealed earlier. Contrary to the 'stylised facts' for mature (but also emerging) economies, where real interest rates are a-cyclical with no clear pattern with respect to timing, *real interest rates* in Poland show up as being pro-cyclical and lagging, implying a counter-cyclical monetary policy (coefficient of correlation with GDP is 0.14 and there is a clear lagging pattern).

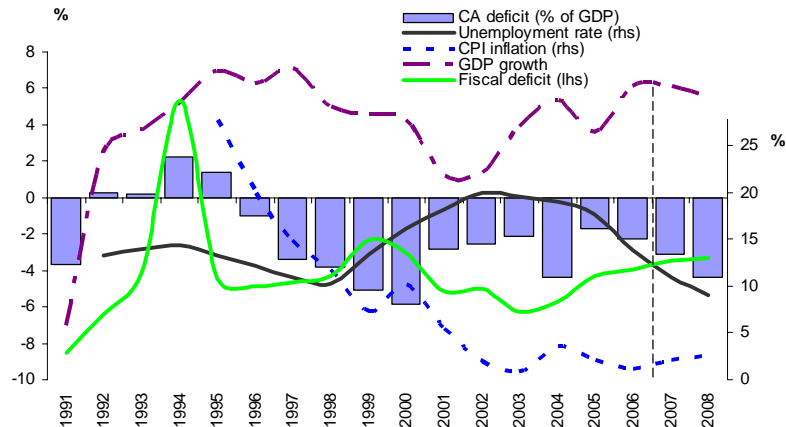


Troughs, peaks and the drivers of growth

There are indications that the Polish business cycle has approached a peak

The first economic cycle since the beginning of economic transition lasted about 10 years, with the expansion and slowdown phases each spanning about 5 years; the cycle ended in the second quarter of 2001. The current upswing has already lasted 6 years, which suggests that the peak is imminent if the length of the current cycle is similar to the previous one. Decelerating leading variables (industrial production, net exports and labour productivity) may also be signs of a turning point.

Chart 1. Developments of basic economic variables in Poland in 1991-2008

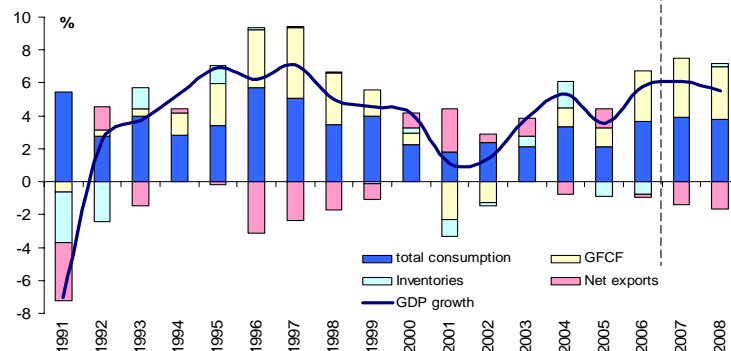


Source: Commission services

Large macroeconomic imbalance during the troughs

In both the early 1990s and in 2001, when the economy was at its trough, there was a large unutilised labour supply and substantial reserves in enterprises' capacity utilisation. The fiscal deficit was also substantial. In the first cycle, ample supply of resources was a consequence of transition to a market economy which caused a recession in 1990-1991. In 2001-2002 it followed from the world economic slowdown and a restrictive monetary policy, which forced Polish enterprises to reorganise to raise their competitiveness and efficiency. Poland got out of the trough twice thanks to exogenous impulses to investment: the restructuring of the London Club debt in 1994 (which brought the first major wave of FDI) and entry into the EU in 2004 (which led to an inflow of EU funds). The external circumstances were also favourable as the world economy expanded in the nineties until 1998 and has been on a stable growth path since 2003.

Chart 2. Contributions to GDP growth in Poland in 1991-2008



Source: Commission services

The main factor that drove real GDP growth in 1995-1997 to about 7% was dynamic domestic demand growth of 8½% on average, supported by robust consumption (about 5 percentage points contribution to GDP growth on average). Despite the fact that the economy was growing above potential and domestic demand was growing significantly faster than GDP, a strong zloty appreciation (with a temporary blip in 2000) ensured that the disinflation process was not disturbed. However, this

situation led to a fast-growing imbalance on the current account: the 2% of GDP surplus in 1994 fell to a deficit of 6% of GDP in 1999 (to which the Russian crisis also contributed).

Growth outlook based on solid foundations for now

It is estimated that the Polish economy is currently expanding at a pace close to its potential (approximated at 5.9% in 2007), on the back of rising domestic demand, which is likely to be followed by increasing imports and a deteriorating current account balance. The growth of gross fixed capital formation accelerated to 17% in 2006 and to nearly 30% y-o-y in the first quarter of 2007. Private consumption increased at 5.2% in 2006 and stepped up to 6.9% y-o-y in the first quarter of 2007, which is significantly higher than the 2.7% average growth in 2000-2003. So far, this expansion of consumption has not led to a rapid increase in the current account deficit (which rose from 1.7% in 2005 to 2.3% of GDP in 2006) or a rise in inflation (which has come in below the central bank's medium-term inflation target of 2.5% for eight quarters in a row), mainly thanks to moderate real wage growth. However, with a tightening labour market, emerging skill mismatches and workforce emigration the pressure on wages is expected to become more significant, contributing to a further increase of consumption. In consequence, it might lead to an escalation of the external imbalance and/or increased inflation.

GDP growth is based on more solid foundations in the current cycle

Nevertheless, GDP growth in the current phase seems to be based on more solid foundations than in the late 1990s:

- Firstly, the share of exports in GDP has nearly tripled in 1992-2006 to about 40%; the number of exporters has also increased considerably. The structure of exports has improved, with a bigger share of processed goods and a higher value added. Foreign direct investment has helped increase the production capacity of the Polish economy, which enables the domestic market to better meet increased private demand, and makes the balance of payments less prone to fluctuations in domestic demand. In addition, increased investment-driven imports are largely balanced by increased exports on account of a good situation in the external environment.
- Secondly, the floating exchange rate is likely to act as a buffer against imported inflation. However, even without a strong zloty appreciation, inflation in Poland during the coming years is expected to stay relatively low: below or around the central bank's medium-term inflation target of 2.5%. As the Polish economy is now more open than 10 years ago, inflation is more influenced by global factors. Increased exposure of Polish enterprises to international competition limits their ability to freely increase prices and wages. They are forced to increase labour productivity faster than wages to maintain their market position. Thus, even with growing wage demands, enterprises are more willing to decrease mark-ups than to raise prices.
- Thirdly, increased household incomes acquired as a result of higher wages and an improved labour market situation may not translate into consumption to the same extent as in the previous economic cycle. There is evidence that households are now more saturated with basic durable and consumption goods which they lacked before⁴ and are more eager to spend additional income on holidays abroad owing to a more mature service sector. Financial markets are more developed than 10 years ago, giving an opportunity for financial investments.

Conclusions

The business cycle in Poland exhibits similar properties to cycles in mature economies, but there are some notable differences for government consumption, net exports and real interest rates (although for the last variable the picture may be blurred by its very high level at the beginning of the transformation process). However, because the data series are short, the results should be interpreted with caution. The irregular behaviour of government consumption in Poland with respect to influence on the business cycle could be related to a discretionary fiscal policy implemented within a political business cycle.

The analysis of the previous upswing in Poland, the identification of variables with leading properties with respect to GDP, and the latest developments all seem to suggest that the Polish economy might have reached the peak of the current cycle in the first quarter of 2007. Nevertheless, thanks to the ongoing process of restructuring of the economy, the slowdown phase is not likely to be as pronounced as in the previous cycle and should not lead to major imbalances. Compared with the previous upswing in the cycle, GDP growth is now more broad-based, the economy is more exposed to international competition and EU membership has given an additional boost to investment activity.

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¹ Pro- or counter-cyclicality of variables (a technical aspect) should not be confused with pro- or counter-cyclicality of policies. For example, if real interest rates are pro-cyclical (i.e. their correlation with the cyclical component of GDP is positive), it implies a monetary policy that is counter-cyclical: the central bank raises the interest rates to cool the economy and keep inflation from growing.

² Carmignani based his conclusions on a data set ranging from 1990 to 2004. As economic variables are more volatile in the emerging economies and data are subject to frequent revisions, the results based on a wider set of data might lead to somewhat different conclusions.

³ The 'normal range' for the ratio of the standard deviation of private consumption to the standard deviation of GDP is reported in the literature to be between 0.80 – 0.85. A value which is lower than 0.80 suggests consumption smoothing.

⁴ See data on household equipment with durable goods in 1996 and 2005 in "Statistical Yearbook of the Republic of Poland" 1997 and 2006, published by the Central Statistical Office.

The *ECFIN Country Focus* provides concise analysis of a policy-relevant economic question for one or more of the EU Member States.

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E-mail: ECFIN-CountryFocus@ec.europa.eu

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