

GLOBAL ECONOMIC OUTLOOK – DECEMBER

Monetary and Statistics Department
External Economic Relations Division

2011

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The December issue of the Global Economic Outlook presents recent and expected developments in selected countries from the point of view of standard indicators such as GDP, inflation, leading indicators, interest rates, exchange rates and commodity prices. The regular detailed analysis (section VII *Focus*) contains an empirical analysis of the monetary policy transmission mechanism of the central bank of the Russian Federation. Russia is one of the large, rapidly growing BRICS countries as well as being one of the world's biggest commodity exporters. The Russian central bank is preparing to introduce inflation targeting. This sets it apart from other major commodity exporters, who tend to rely on pegging their currencies to the US dollar. In this context, therefore, it is interesting to track the functioning of Russia's monetary policy transmission mechanism and the pass-through of exchange rate shocks to Russian inflation.

The debt problems of euro area countries are still the main factor maintaining financial market volatility at elevated levels and threatening the future evolution of the real economy at the global level and especially in the euro area. European politicians still have not found a solution that is acceptable to all and strong and credible enough also to satisfy financial market participants and reduce their risk aversion. The risk premium is rising on both the euro and dollar money markets. The ECB continues to oppose larger-scale purchases of bonds of the troubled countries, but it is easing monetary policy faster than expected.

The GDP growth forecasts for 2011 are little changed. However, based on the aforementioned developments, further minor downward revisions of the outlook for 2012 have been made for all the monitored economies except the USA. According to CF12, the countries of the southern periphery of the euro area will fall into recession. Different developments in Europe and the USA are also signalled by leading indicators. In the USA, those indicators improved slightly for industry and rose relatively strongly for consumer confidence. By contrast, the leading indicators for the euro area (except Germany) and China continued to decline. In 2012, inflation should start to descend from the elevated levels observed in all the economies under review this year.

The ECB surprised the markets in December by further lowering its refinancing rate from 1.25% to 1.00% in response to the deteriorating economic outlook for the euro area. The rate cut had not been expected to take place until 2012 Q1. CF analysts therefore revised their expectations and now predict one or two more cuts in the ECB's refinancing rate during 2012 H1. A rapid increase in the German government bond yield of 0.5 percentage point generated concerns in the second half of November. However, this increase came to a halt in early December. The expected evolution of the dollar money market remains unchanged, only the period for which interest rates should remain at the current still relatively low levels was extended further.

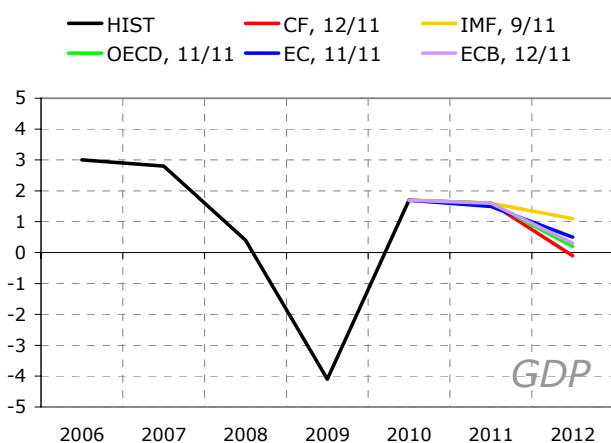
Increased interest in, and appreciation of, the US dollar led to a deterioration in dollar liquidity on European markets. This forced the world's major central banks to agree to lower prices of foreign exchange swaps.

Despite the deterioration of the world economic outlook and the appreciation of the dollar, the price of Brent oil has maintained an only slightly falling path for some time now, a path also smoothly followed by the futures curve. Oil prices are still being supported by falling inventories in OECD countries. In the USA, the price of WTI oil increased and the Brent-WTI spread fell dramatically owing to a better outlook for the US economy (and following news of a technical solution to the oil surplus in Cushing). Prices of food commodities continued to fall sharply, while prices of industrial metals are now showing signs of stabilisation following an earlier decrease.

II.1 GDP

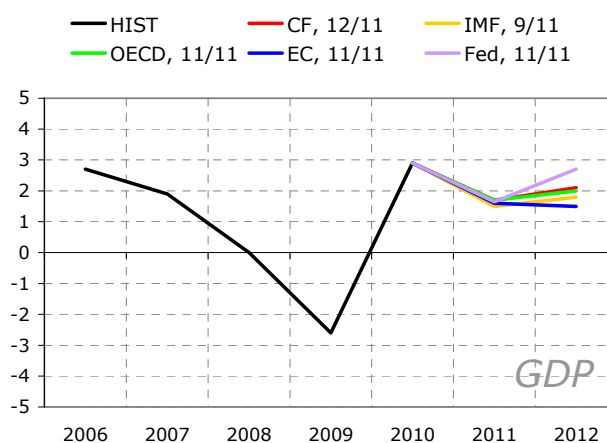
The euro area remains under pressure from debt problems and rising concerns about the disintegration of the whole monetary union. New GDP forecasts (CF, OECD and ECB) agree that the region will grow by 1.6% in 2011, with Germany recording growth of 3% (CF, OECD and DBB) due to better macroeconomic indicators (compared with the rest of the euro area). Growth in the USA is expected to reach 1.7% this year. China's economy will grow by 9.2%–9.3%. The year 2012 will bring a marked slowdown in all the economies under review (despite central banks' efforts to support the economy through quantitative easing in the advanced economies and in China). The worst outlook is for the euro area, where economic growth will drop to -0.1% according to the December CF (which expects GDP to decline in Italy, Greece, the Netherlands, Portugal and Spain). The new ECB and OECD forecasts estimate euro area growth at between 0.2% and 0.3%. Germany will slow to 0.5%–0.6%. By contrast, the GDP growth outlook for the USA for 2012 improved compared to the forecast for this year, to 2.0%–2.1%. Growth in Chinese economic activity will not exceed 8.5% next year.

EURO AREA



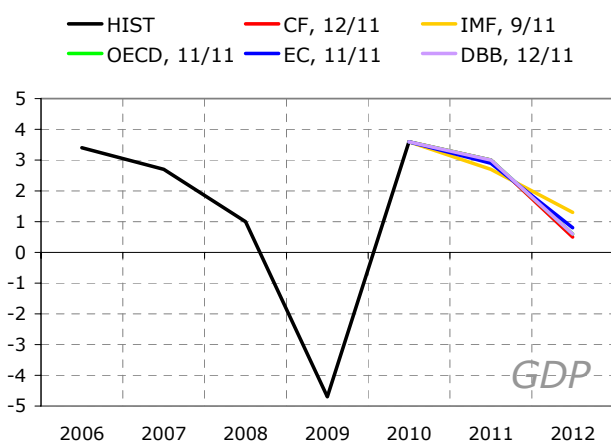
	HIST	CF	IMF	OECD	EC	ECB
2010	1.7					
2011		1.6	1.6	1.6	1.5	1.6
2012		-0.1	1.1	0.2	0.5	0.3

USA



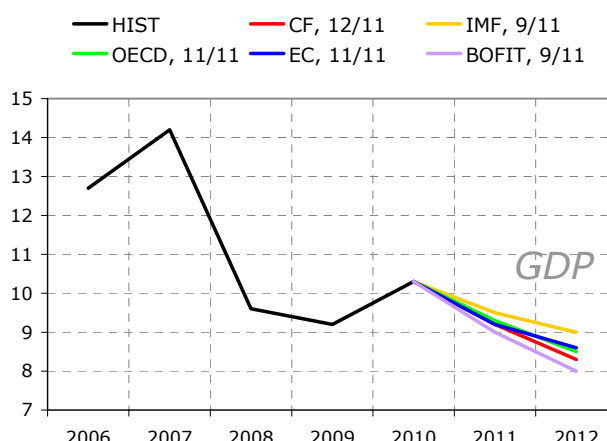
	HIST	CF	IMF	OECD	EC	Fed
2010	2.9					
2011		1.7	1.5	1.7	1.6	1.7
2012		2.1	1.8	2.0	1.5	2.7

GERMANY



	HIST	CF	IMF	OECD	EC	DBB
2010	3.6					
2011		3.0	2.7	3.0	2.9	3.0
2012		0.5	1.3	0.6	0.8	0.6

CHINA



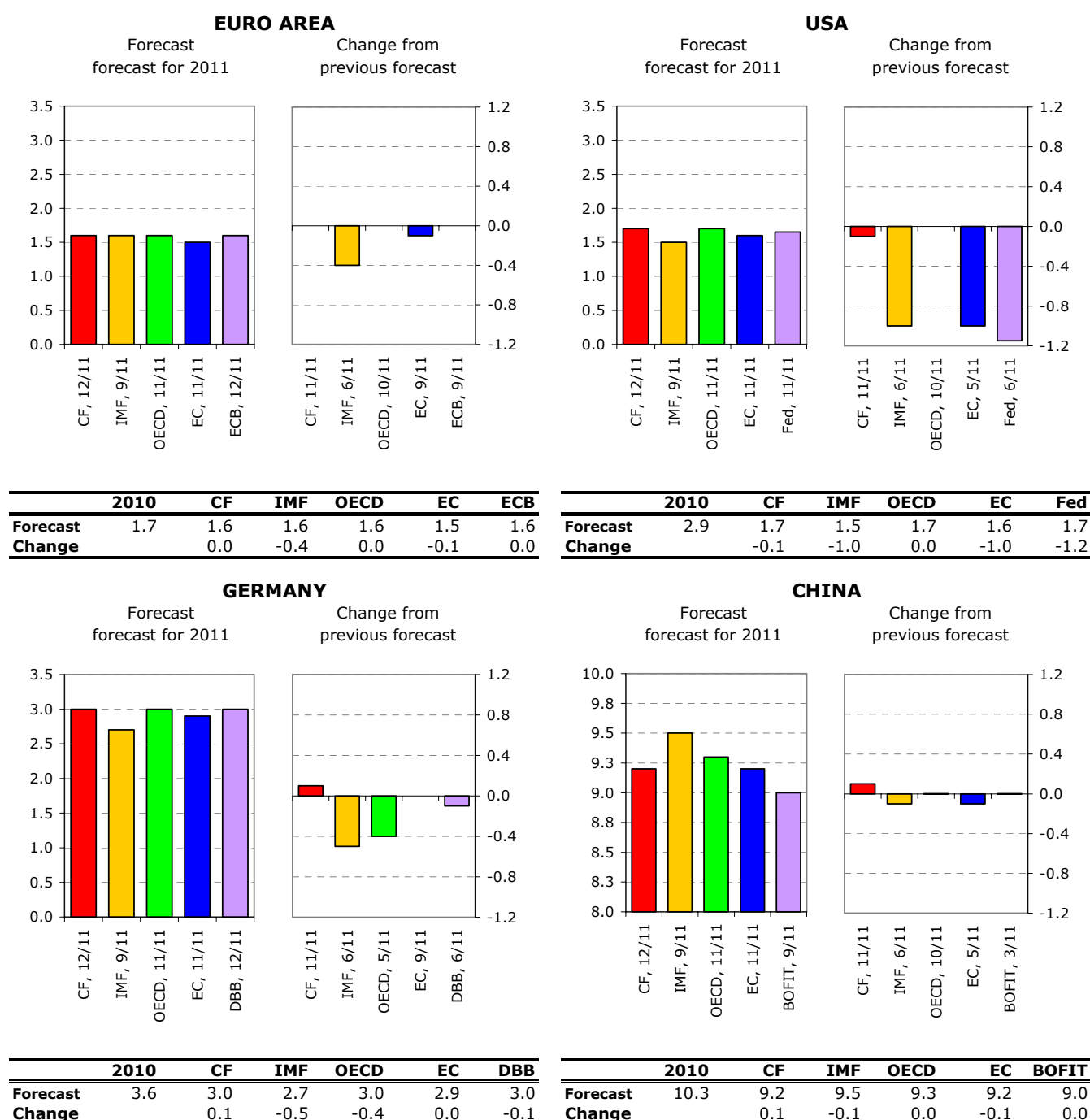
	HIST	CF	IMF	OECD	EC	BOFIT
2010	10.3					
2011		9.2	9.5	9.3	9.2	9.0
2012		8.3	9.0	8.5	8.6	8.0

Note: Legend shows latest forecast data in format "Source, month/year of forecast publication". HIST: historical value. ECB and Fed: midpoint of range. [Cut-off date for data: 16 December 2011]

Source: CNB calculation using Eurostat, CF, IMF, OECD, EC, ECB, Fed, DBB and BOFIT databases.

II.2 Current GDP forecast and change from the previous forecast

The new outlooks for euro area GDP growth in 2011 are unchanged. The forecasts for the other economies under review have been revised downwards or left unchanged, except for the December CF, which increased its predictions for Germany and China by 0.1 percentage point. The outlooks for 2012 have been revised towards weaker growth in economic activity (except those for the USA, which are either unchanged or higher). The largest changes were for the euro area and Germany, for which one half of the new forecasts were revised downwards by 1 percentage point or more (ECB for the euro area, OECD and DBB for Germany).



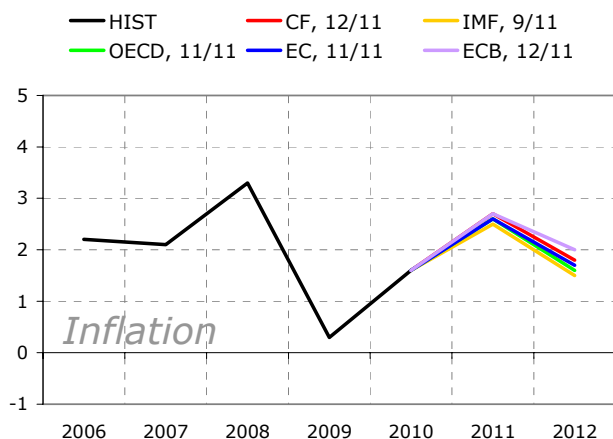
Note: Horizontal axis of left-hand (right-hand) chart shows latest (previous) forecast data in format "Source, month/year of forecast publication". HIST: historical value. ECB and Fed: midpoint of range. [Cut-off date for data: 16 December 2011]

Source: CNB calculation using Eurostat, CF, IMF, OECD, EC, ECB, Fed, DBB and BOFIT databases.

II.3 Inflation

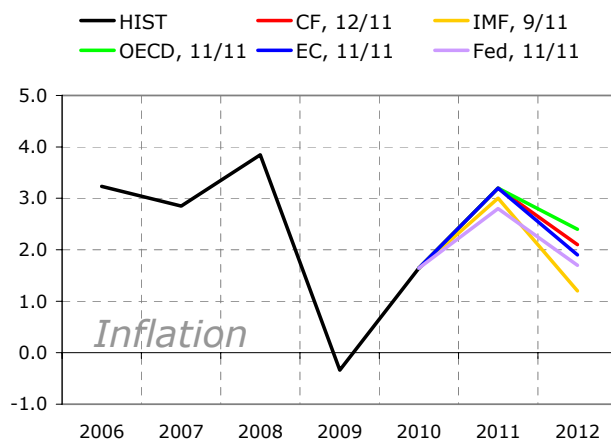
According to the new CF, OECD, ECB and DBB outlooks, inflation will remain somewhat elevated in all the economies under review in 2011. In the euro area and Germany, domestic prices will rise by between 2.3% and 2.7%. Inflation is expected to reach 3.2% in the USA, and in China consumer prices will rise by 5.4%–5.6%. The global downturn will affect inflation next year. Inflation in the euro area and Germany will fall below 2%. In the USA, it will reach 2.1%–2.4%. Price growth in China will slow to 3.5%–3.8%.

EURO AREA



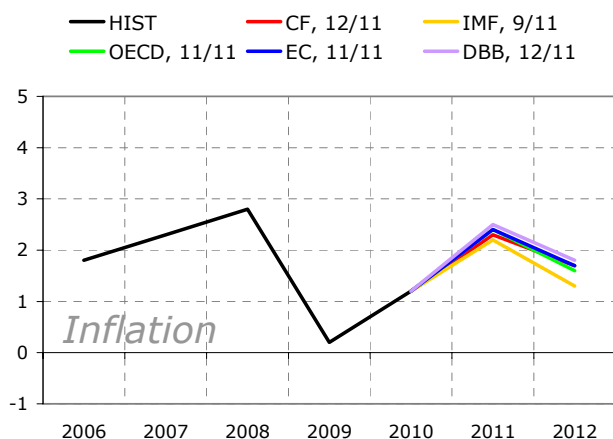
	HIST	CF	IMF	OECD	EC	ECB
2010	1.6					
2011		2.7	2.5	2.6	2.6	2.7
2012		1.8	1.5	1.6	1.7	2.0

USA



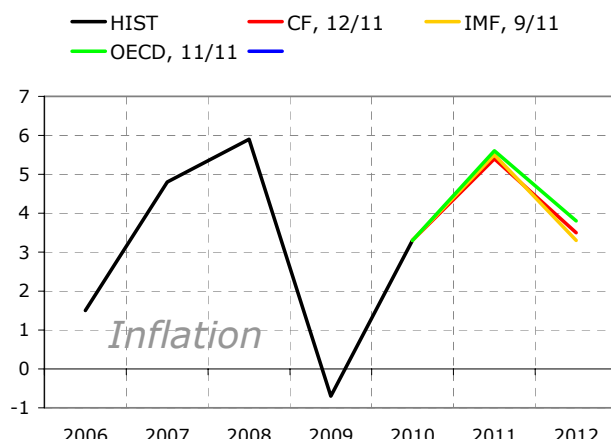
	HIST	CF	IMF	OECD	EC	Fed
2010	1.6					
2011		3.2	3.0	3.2	3.2	2.8
2012		2.1	1.2	2.4	1.9	1.7

GERMANY



	HIST	CF	IMF	OECD	EC	DBB
2010	1.2					
2011		2.3	2.2	2.4	2.4	2.5
2012		1.7	1.3	1.6	1.7	1.8

CHINA



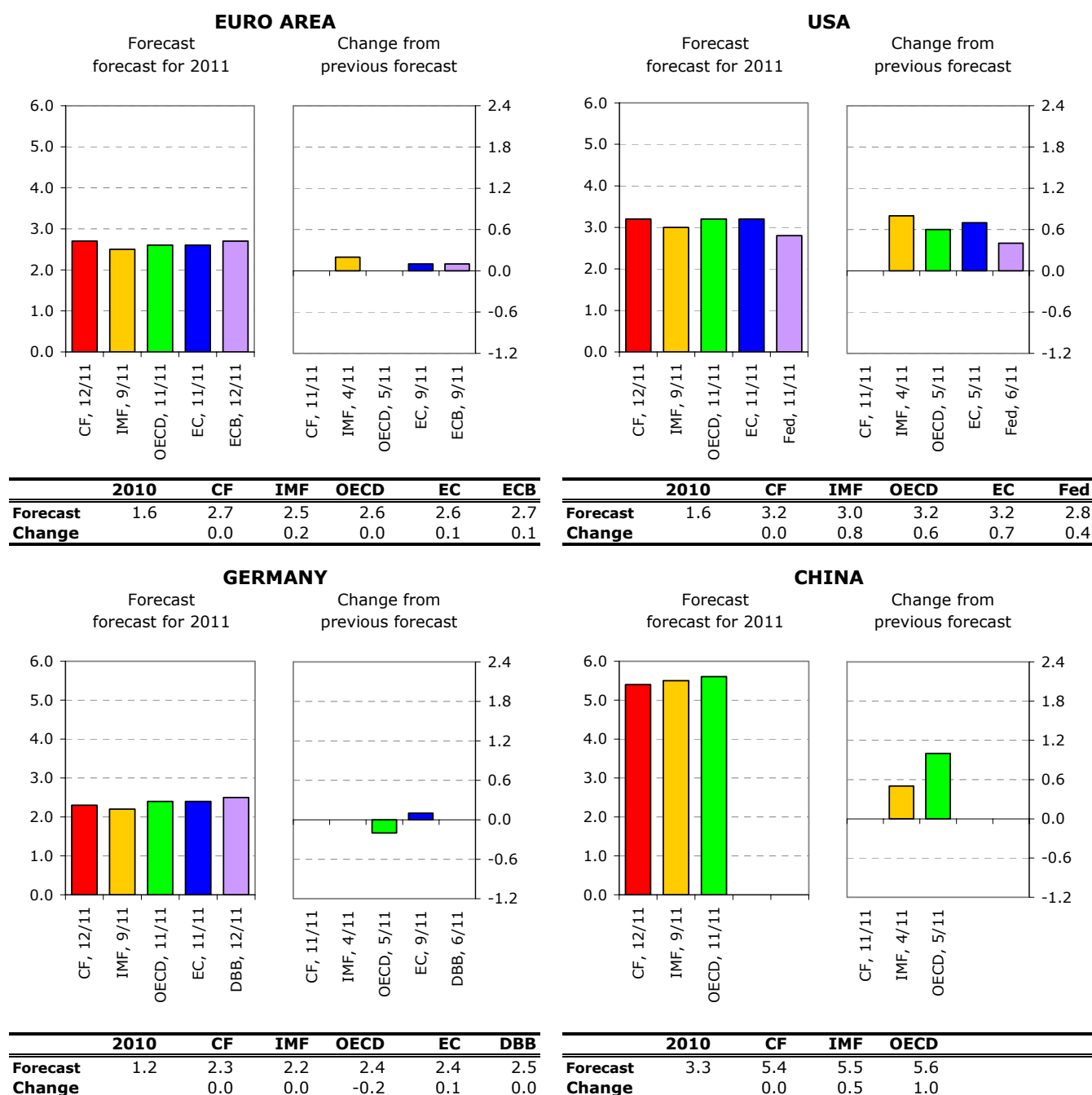
	HIST	CF	IMF	OECD
2010	3.3			
2011		5.4	5.5	5.6
2012		3.5	3.3	3.8

Note: Legend shows latest forecast data in format "Source, month/year of forecast publication". HIST: historical value. ECB and Fed: midpoint of range. [Cut-off date for data: 16 December 2011]

Source: CNB calculation using Eurostat, CF, IMF, OECD, EC, ECB, Fed, DBB and BOFIT databases.

II.4 Inflation forecast and change from the previous forecast

The CF and DBB left their December outlooks for inflation in 2011 unchanged. The OECD expects inflation to be 0.6 percentage point higher in the USA and 1.0 percentage point higher in China this year. The OECD outlook for inflation in Germany was lowered by 0.2 percentage point. The changes in the outlooks follow no clear trend and differ depending on the institution and the frequency of forecast updates.

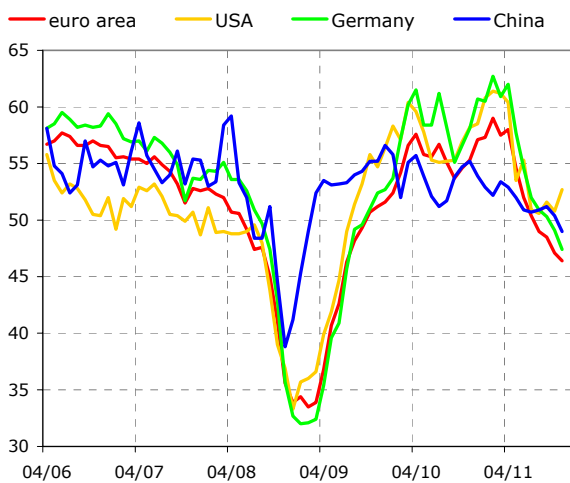


Note: Horizontal axis of left-hand (right-hand) chart shows latest (previous) forecast data in format "Source, month/year of forecast publication". HIST: historical value. ECB and Fed: midpoint of range. [Cut-off date for data: 16 December 2011]

Source: CNB calculation using Eurostat, CF, IMF, OECD, EC, ECB, Fed, DBB and BOFIT databases.

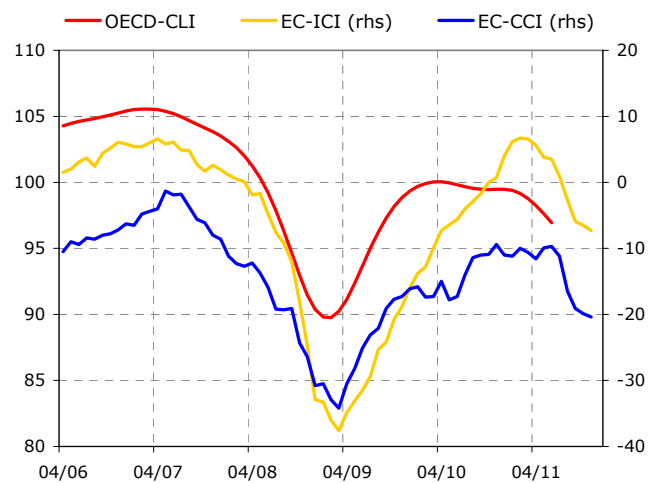
The economic outlook for the US economy based on leading indicators improved somewhat in December. The PMI (Purchasing Managers' Index) in manufacturing, which significantly exceeded the 50% level, and the consumer confidence indicators increased significantly. These results point to an acceleration in economic growth in the first half of next year. The outlook for the euro area is less favourable compared to the USA. Lower PMI and consumer confidence indicators suggest a further slowdown in economic activity. Despite the drop in the PMI, German economic growth should be higher than in the rest of the euro area next year, as the indicators of business and consumer confidence have risen slightly. Hence, weaker GDP growth can be expected, but the probability of a recession is not high. The PMI in manufacturing for China decreased below 50% for the first time since January 2009.

PMI IN MANUFACTURING



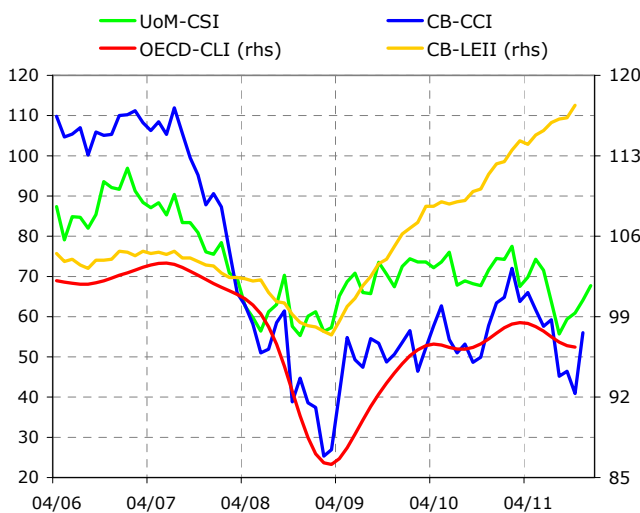
	EA	US	DE	CN
9/11	48.5	51.6	50.3	51.2
10/11	47.1	50.8	49.1	50.4
11/11	46.4	52.7	47.4	49.0

EURO AREA



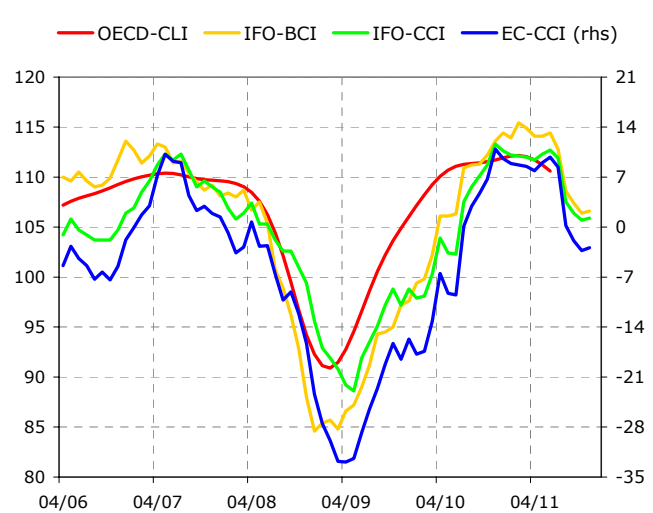
	OECD-CLI	EC-ICI	EC-CCI
9/11		-5.9	-19.1
10/11		-6.5	-19.9
11/11		-7.3	-20.4

USA



	OECD-CLI	CB-LEII	UoM-CSI	CB-CCI
9/11	96.5	116.3	59.4	46.4
10/11	96.3	117.4	60.9	40.9
11/11			64.1	56.0

GERMANY



	OECD-CLI	IFO-BCI	IFO-CCI	EC-CCI
9/11		107.4	106.4	-1.9
10/11		106.4	105.7	-3.3
11/11		106.6	105.9	-2.9

Note: OECD-CLI stands for OECD Composite Leading Indicator, EC-ICI (right-hand scale) for European Commission Industrial Confidence Indicator, EC-CCI (right-hand scale) for EC Consumer Confidence Indicator, CB-LEII for Conference Board Leading Economic Indicator, CB-CCI for CB Consumer Confidence Index, UoM-CSI for University of Michigan Consumer Sentiment Index, IFO-BCI for Institute for Economic Research – Business Climate Index, and IFO-CCI for IFO Consumer Confidence Index. [Cut-off date for data: 15 December 2011]

Source: CNB calculation using OECD, EC, IFO and UoM databases.

IV.1 Outlook for short-term and long-term interest rates: Euro area

The escalating financial market tensions and worsening economic outlook led the ECB to cut its main refinancing rate again at its December meeting (from 1.25% to 1.00%) despite persisting elevated inflation in the euro area. The cut thus came earlier than expected by CF analysts a month ago. In reaction to ECB communications in December, the analysts revised their estimates of the future ECB rate path further sharply downwards. They now expect a further fall of 0.25 percentage point during 2012 H1, and most expect the ECB rate to be 0.5% at the end of September.

Interbank market rates are falling slower than the (expected) refinancing rate of the central bank, leading to higher risk premia for maturities of one month and more. The 3M EURIBOR implied future rate curve fell only slightly, and not until 2013. For 1Y rates the fall was larger and the expected start of growth in rates was postponed to 2013.

The ten-year German government bond yield rose by 0.5 percentage point (to 2.3%) in the second half of November and has been falling only slightly since then. CF12 revised the outlook only slightly upwards at both the three-month and one-year horizons.

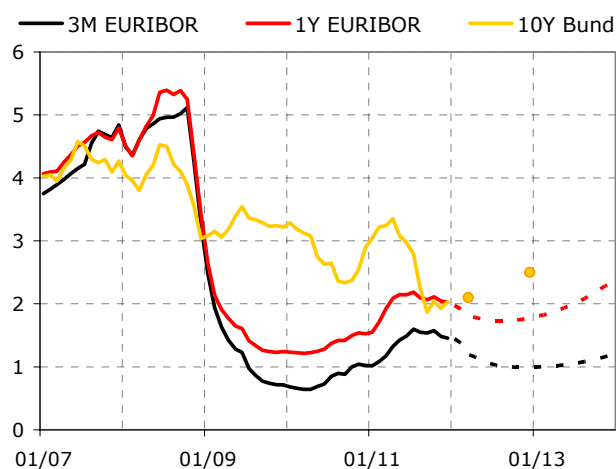
IV.2 Outlook for short-term and long-term interest rates: USA

By contrast, the Fed did not surprise the markets at its December meeting and its communication on future monetary policy was virtually unchanged. As the group of voting members will change significantly in January, a potential shift in position can only be expected next year.

The risk premium has also been rising steadily on the dollar money market roughly since August. As the Fed's key interest rate is already in fact zero and no further fall can be expected, the entire growth in the risk premium is reflected in a rise in LIBOR dollar rates (maturities of three months and above). However, this increase should halt in early 2012. The path of implied future 1Y LIBOR rates is almost the same as a month earlier, while that for the 3M maturity moved downwards slightly only in 2013. The 3M rate should thus remain flat for most of 2013.

The ten-year government bond yield has been around 2% since early November and CF12 shifted the forecast downwards slightly.

EURO AREA

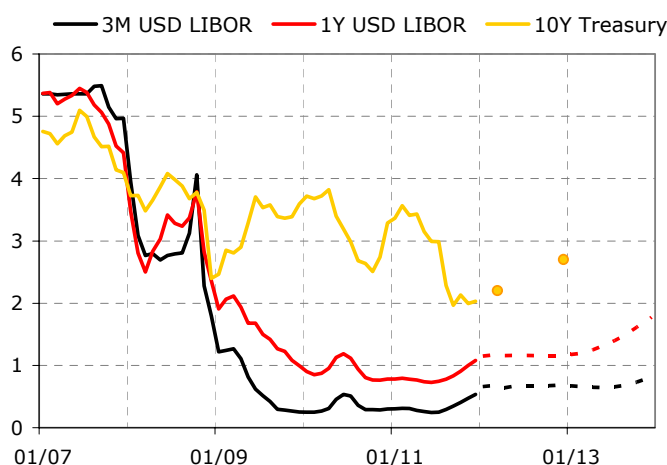


	11/11	12/11	06/12	12/12	06/13	12/13
3M EURIBOR	1.48	1.46	1.06	1.00	1.05	1.19
1Y EURIBOR	2.04	2.03	1.73	1.78	1.98	2.36
	11/11	12/11	03/12	12/12		
10Y Bund	1.93	2.03	2.10	2.50		

Note: Forecast for EURIBOR rates is based on implied rates from interbank market yield curve (FRA rates are used from 4M to 15M and adjusted IRS rates for longer horizons). Forecast for German government bond yield (10Y Bund) is taken from CF. Dashed lines and points represent outlook. [Cut-off date for data: 12 December 2011]

Sources: Thomson Reuters (Datastream), Bloomberg, CNB calculations.

USA



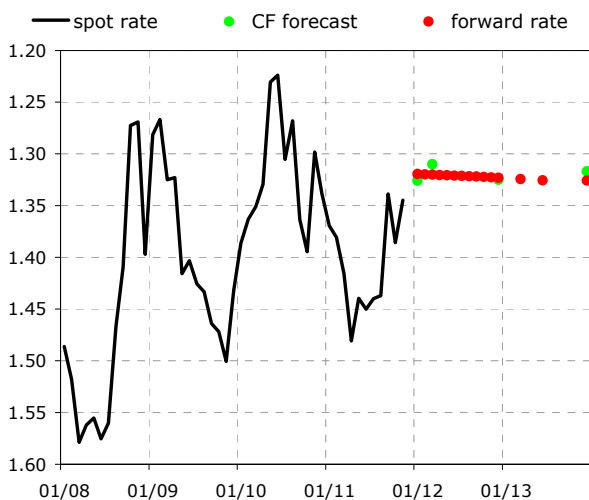
	11/11	12/11	06/12	12/12	06/13	12/13
3M USD LIBOR	0.48	0.54	0.67	0.68	0.65	0.81
1Y USD LIBOR	1.00	1.08	1.16	1.16	1.34	1.77
	11/11	12/11	03/12	12/12		
10Y Treasury	2.00	2.03	2.20	2.70		

Note: Implied LIBOR rates are derived from London interbank market yield curve. Forecast for 10Y Treasury yield is taken from CF. Dashed lines and points represent outlook. [Cut-off date for data: 12 December 2011]

Sources: Thomson Reuters, Bloomberg, CNB calculations.

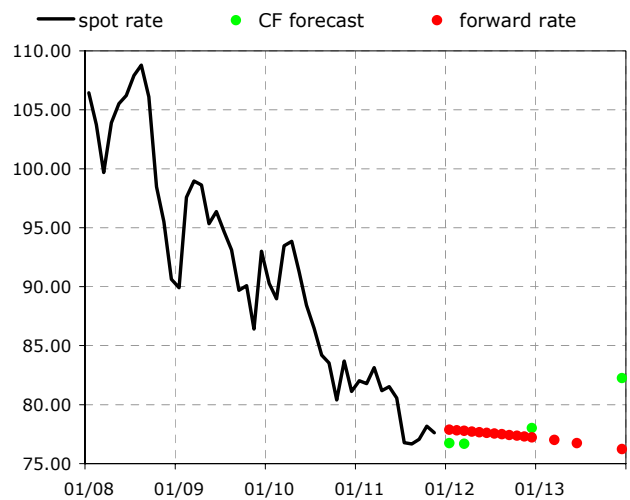
A string of positive news from the US economy and the dollar's status as a safe currency led investors to move towards the dollar, while concerns escalated in the euro area. Tighter dollar liquidity in Europe prompted the world's major central banks to agree to change the conditions of foreign exchange swaps. The December EU summit, which produced many long-term fiscal stability measures, had also been anticipated with hope. However, stronger short-term steps had been expected, and the euro weakened against the dollar. Given the uncertainty, the new CF outlook still expects stability, but in a weaker range than a month earlier (USD 1.31–1.33). The outlooks for the British pound and the Swiss franc were revised similarly. Demand for the yen rebounded in November despite central bank interventions and tentative signs of recovery. The slowdown in south-east Asia (including China) will have a marked effect on the Japanese economy, but the CF expects the yen to remain at historical highs until the end of 2012.

US\$ per Euro



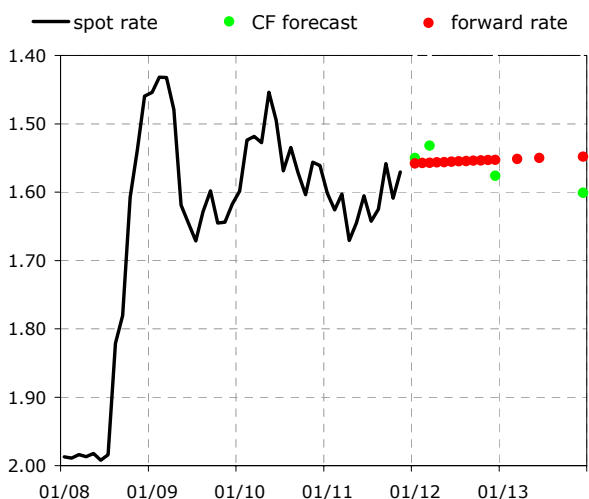
	12/12/11	01/12	03/12	12/12	12/13
spot rate	1.319				
CF forecast		1.326	1.310	1.325	1.317
forward rate		1.319	1.320	1.323	1.326

Yen per US\$



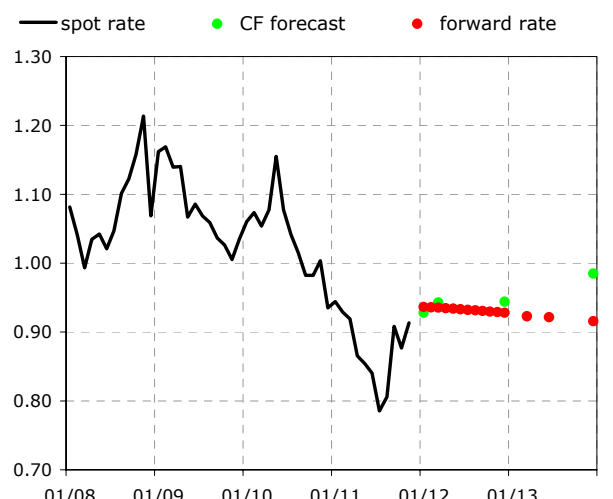
	12/12/11	01/12	03/12	12/12	12/13
spot rate	77.94				
CF forecast		76.74	76.68	78.01	82.24
forward rate		77.87	77.77	77.21	76.22

US\$ per UK£



	12/12/11	01/12	03/12	12/12	12/13
spot rate	0.937				
CF forecast		1.550	1.532	1.576	1.601
forward rate		1.558	1.557	1.553	1.548

Swfr per US\$



	12/12/11	01/12	03/12	12/12	12/13
spot rate	0.908				
CF forecast		0.928	0.943	0.944	0.985
forward rate		0.936	0.935	0.928	0.916

Note: Increase in currency pair represents appreciation of US dollar; data as of the last day of the month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibilities for securing future exchange rate. [Cut-off date for data: 15 December 2011]

Source: CNB calculation using Bloomberg and Consensus Forecasts databases.

VI.1 Oil and natural gas

The Brent crude oil price has stayed in the range of USD 106–113 a barrel since mid-November. It initially edged down due to the appreciating dollar, but this trend reversed at the end of the month and the Brent price resumed its growth. After the Fed (together with the ECB and other central banks) decided to provide cheaper access to dollar liquidity through swap lines it rose to a two-week high. The increasing risk of a euro area recession and uncertainty regarding the euro area debt crisis fostered a decline in the Brent crude oil price in the first half of December. OPEC's decision to leave oil extraction at the current level of 30 million barrels a day had been widely expected by investors. Prices followed a slightly falling trend despite mostly optimistic news from the US economy and shrinking oil inventories in OECD countries. The Brent-WTI spread (see the November GEO) was gradually eliminated in December, owing among other things to an expected pipeline reversal that should reduce inventories in Cushing (the WTI delivery point).

VI.2 Other commodities

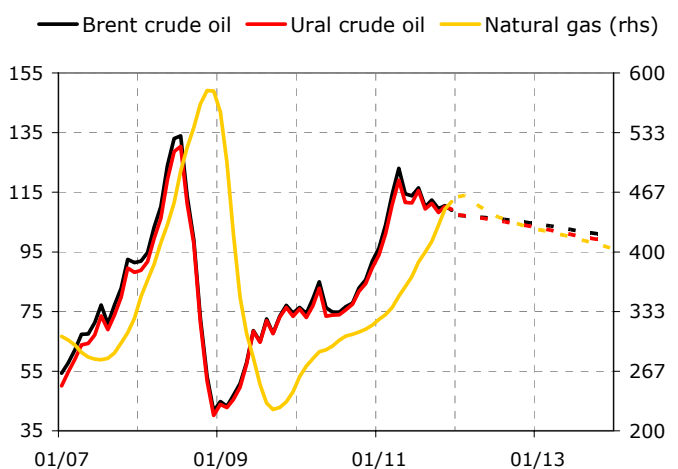
The average monthly non-energy commodity price index declined for the eighth consecutive month and is about 25% down from its February high. Prices of industrial metals decreased to broadly the same extent, while food commodity prices fell by 20%. Prices of industrial metals broadly stabilised in November and the first half of December, while food commodity prices have continued to decline rapidly in the past two months.

Within food prices, price growth was recorded for all components except meat, which remained broadly unchanged. The price of cotton also decreased further. By contrast, the price of rubber was little changed.

As for industrial metals, only lead prices increased, while prices of copper, nickel and zinc were volatile during the last month but were ultimately virtually unchanged. Aluminium, platinum and tin prices fell, as did prices of carbon steel and stainless steel.

Prices of electricity and coal also continued to fall. However, their outlook is still upward.

OUTLOOK FOR PRICES OF OIL AND NATURAL GAS

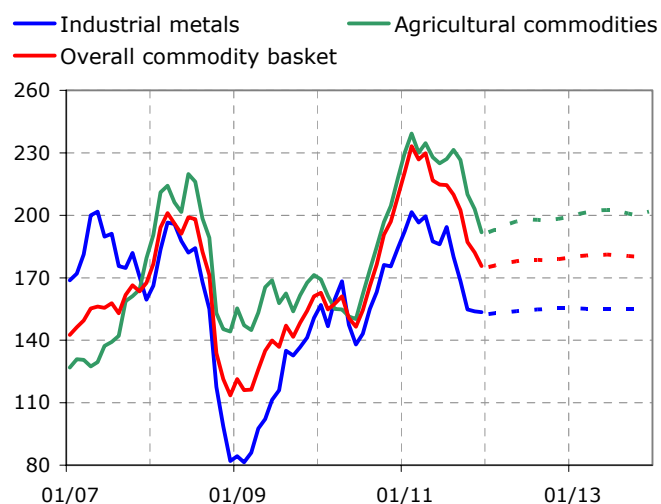


	12/11	06/12	12/12	06/13	12/13
Brent crude oil	109.0	106.3	104.7	102.5	100.4
Ural crude oil	109.2	105.8	103.6	100.9	98.4
Natural gas	456.3	444.0	426.6	416.7	404.5

Note: Brent oil price in USD/barrel (ICE quotation). Price of Russian natural gas at German border in USD/1,000 cubic m (IMF database). Future oil prices are derived from oil prices. Dashed line represents outlook. [Cut-off date for data: 12 December 2011].

Source: Bloomberg, IMF, CNB calculations.

OUTLOOK FOR OTHER COMMODITY PRICES



	12/11	06/12	12/12	06/13	12/13
Industrial metals	153.5	154.3	155.2	154.9	154.8
Agricultural commodities	191.8	197.8	198.9	202.6	201.7
Overall commodity basket	175.6	178.5	179.4	181.1	180.9

Note: Chart shows price indices, year 2005 = 100. Dashed line represents outlook based on futures. [Cut-off date for data: 12 December 2011].

Source: Bloomberg, outlooks based on futures.

AN EMPIRICAL ANALYSIS OF MONETARY POLICY TRANSMISSION IN THE RUSSIAN FEDERATION ¹

Fast growing economies – especially those of the BRICS² group – are increasingly seen as having a crucial ability to affect global economic growth. Although it is growing more slowly than China and India, Russia plays an important role in the world economy, primarily as one of the biggest commodity exporters. Surprisingly little attention is paid to the effectiveness of Russian monetary policy. This article complements the existing literature and analyses the effectiveness of the monetary policy of the Russian Federation using an empirical model of the transmission of shocks to key macroeconomic variables. The results indicate that consumer prices respond relatively quickly to an exchange rate shock and also that the interest rate channel is non-functional in the case of transmission of shocks to the real economy.

Introduction

The monetary policy of the central bank of the Russian Federation (CBR) combines the primary objective of reducing inflation with the application of a managed float of the Russian rouble against a dollar-euro basket. As the combination of inflation and exchange rate targets can be rather contradictory, the CBR is trying to find an optimal strategy satisfying both objectives (Ignatiev, 2003). As a result, the question arises whether the individual monetary policy transmission channels are effective. Another factor attracting attention to Russian monetary policy is the CBR's gradual preparations for the introduction of fully fledged inflation targeting,³ which has been under consideration for some time. Inflation targeting would significantly differentiate Russia's monetary policy from that of other oil-exporting countries, which as a rule peg their national currencies to the US dollar, and also from the monetary policies of Russia's nearest neighbours and key trading partners – Belarus, Ukraine and Kazakhstan. A functioning transmission mechanism is one of the conditions for successful introduction of inflation targeting. In this context, the analysis of the transmission of monetary policy and exchange rate shocks to inflation in Russia seems a very topical issue.

1. Literature review

Given the importance of exchange rate policy and the limited effectiveness of monetary policy rates, the empirical literature examining the functioning of the transmission mechanism in Russia is analysed via the exchange rate channel. However, the empirical results of the pass-through of exchange rate shocks to inflation are difficult to integrate owing to substantial differences in the models, econometric methods and time periods

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² BRIC until 2011: Brazil, Russia, India and China. South Africa applied for membership of the group at the end of 2010 and formally became a member on 18 February 2011.

³ According to the "Guidelines for the Single State Monetary Policy in 2012 and for 2013 and 2014" (see CBR, 2011), the CBR plans to complete its transition to inflation targeting by the end of 2014. In particular, this means consistently reducing inflation (from 5–6% in December 2012 to 4–5% in December 2014) and, in the longer term, maintaining low rates of price growth. The CBR will strengthen the regulatory function of interest rates over the three-year horizon. Exchange rate policy will be aimed at gradually scaling down the CBR's interventions in the rate-setting process and creating conditions for the transition to the floating exchange rate system. During the transitional period, the CBR is expected to intervene only in cases of excessive exchange rate volatility and long-term imbalances between demand and supply in the foreign exchange market. Although the CBR is maintaining the management of fluctuations of the rouble against key world currencies over the three-year horizon, the Strategy for 2012–2014, unlike in previous years, does not directly mention the rouble's link to the dollar-euro basket, which has existed since February 2005. In addition, the CBR wound up its anti-crisis measures in 2011. The September 2011 issue of Global Economic Outlook gives an overview of CBR monetary policy in past years.

used. Stavrev (2003) identifies a 0.5–0.7% response of consumer prices to a 1% shock in 1996–2002. Korhonen and Wachtel (2006) came to a similar conclusion. According to their calculations, the response of domestic prices to a 1% shock was 0.42% in 1999–2004. According to Dobrynskaya (2008), the average consumer price reaction fluctuated around 0.35% between January 1998 and May 2005. The use of shorter time intervals suggests changing transmission over time, as the reaction exceeded 0.6% at the start of the period, then fell to zero, but turned positive again (0.1%) in 2003–2005. Shmykova and Sosunov (2005) reach the opposite conclusion. According to their calculations, the reaction of domestic prices to an exchange rate shock rose from 0.06% in 1999–2001 to 0.26% in 2002–2004. Beck and Barnard (2009) estimate the pass-through of shocks to the rouble's rate against the two-currency basket at around 0.05% for January 2000–October 2009. The authors' recursive estimates suggest greater pass-through (0.10–0.12%) for the period as a whole, the exception being the 2008 financial crisis, when the reaction of consumer prices was almost zero. According to Kataranova (2010), the response of domestic prices to a 1% exchange rate shock in 2000–2008 did not exceed 0.2%. The use of a shorter time period reduces the degree of transmission of shocks to inflation.

Some studies examine the transmission of interest rate shocks to inflation and economic activity. According to Basu et al. (2007), exchange rate shocks have a larger impact on inflation than interest rate shocks. By contrast, according to Ito (2009), a monetary policy tightening immediately generates a decline in inflation. Mallick and Sousa (2011) come to a similar conclusion, but, in contrast to the previous studies, point to a much greater fall in economic activity than in inflation.

2. Empirical model and results

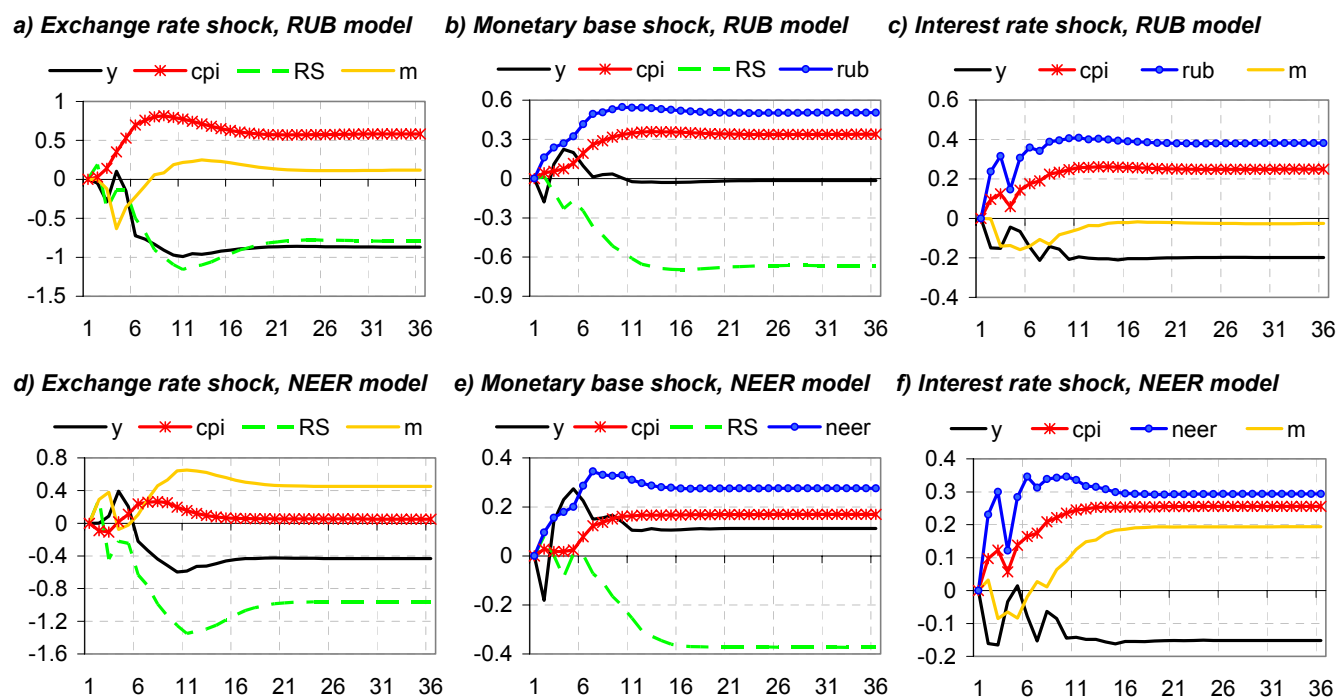
In this article, the pass-through of monetary policy and exchange rate shocks to inflation is modelled using a vector error-correction model (VECM). This specification is a modified version of the models of Mojon and Peersman (2001) and Arnoštová and Hurník (2005) and contains five endogenous variables: the consumer price index (**CPI**), the industrial production index (**Y**), the short-term interbank market rate (**RS**), the rouble-dollar exchange rate (**RUB**) and the monetary base (**M**). The price of Ural crude oil (**URALS**), the industrial production index of the euro area as the largest trading partner of the Russian Federation (**Y^{EA}**), the foreign three-month interbank market interest rate – EONIA (**RS^{EA}**) and binary variables (**D**) enter the model as exogenous variables. The alternative specification uses the nominal effective exchange rate of the rouble (**NEER**) instead of the bilateral exchange rate. The model is estimated using monthly data for 1995:07–2011:05.⁴ All the variables except interest rates enter the model in logarithms; variables in the algorithms are marked by lower-case letters.

Figure VII-1 shows the impulse responses over 36 months for the endogenous variables in reaction to a 1% exchange rate depreciation, a 1% rise in the monetary base and a 1 p.p. domestic interest rate shock. The reaction of prices to an exchange rate shock in the rouble-dollar exchange rate (RUB) specification is much larger than the impulse

⁴ Binary variables were used to reflect the asymmetric responses of the endogenous variables in the following appreciation/depreciation periods: 1995:07–1998:07, 1998:08–1999:05, 1999:06–2002:12, 2003:01–2008:07, 2008:08–2009:02, 2009:03–2011:05. All variables are integrated of order one. The lag lengths differ according to the chosen test. The Schwarz information criterion recommends two lags, whereas the Akaike and likelihood ratio tests suggest a longer lag. The model was estimated with three lags. The Johansen cointegration test identified two cointegrating vectors at the 1% significance level. Insignificant cointegration relationships were excluded from the model. The pass-through of exchange rate shocks can also be examined using a model containing a distribution chain. Import prices are an important part of such a model, but for Russia these prices are unfortunately not available on a monthly basis. It is assumed that the transmission of exchange rate shocks to import prices is significant. According to Salickýj (2010), for example, the reaction of some goods categories to a 1% exchange rate shock can be as high as 0.92%.

response to a shock to the NEER (alternative specification). This confirms the rouble's "dependence" primarily on USD. The maximum price reactions are 0.8% (RUB model) and 0.3% (NEER model). In the longer term, the transmission of the exchange rate shock to inflation is 0.58% (RUB model) and 0.05% (NEER model). Industrial production meanwhile declines. A positive shock to the monetary base causes consumer prices to rise. By contrast, growth in interest rates is unable to slow inflation and – in line with the results of other studies (e.g. Mallick and Sousa, 2011) – has a strong negative impact on industrial production.

Figure VII-1 VECM results



Note: Monthly data. Exchange rate growth (RUB and NEER) means exchange rate depreciation.

Source: CNB calculations.

Owing to the large number of parameters estimated using relatively short time series, the VECM results are compared with a simple error correction model (ECM). This model differentiates between short-term and long-term relationships between the variables, but ignores relationships between equations. The model explains inflation using the exchange rate, the monetary base, interest rates, industrial production, oil prices and binary variables. The cointegration equation describing the long-term (equilibrium) relationship is estimated using the FMOLS method. The ECM results are summarised in equations (1) and (2). The chosen specification contains statistically significant coefficients only. The lag length is also set on the basis of statistical significance. Standard deviations are given in parentheses.

$$cpi_t = 0.538 \cdot \Delta_{pi} \text{ }_{t-1} + 0.398 \cdot \Delta rub_t - 0.216 \cdot \Delta rub_{t-1} + 0.053 \cdot \Delta m_t + 0.058 \cdot ECT_{t-1} + 0.10 \cdot \sum_{i=1}^5 D_i + \varepsilon_t \quad (1)$$

(0.059) (0.011) (0.025) (0.011) (0.018)

Cointegration equations:

$$ECT_t = \Delta cpi_t - 0.454 \cdot rub_t - 0.391 \cdot m_t - 0.055 \cdot urals_t + 5.252 \cdot \sum_{i=1}^5 D_i \quad (2)$$

(0.022) (0.019) (0.022)

According to cointegration equation 2, the reaction of prices to a 1% depreciation is 0.45%. The short-term or immediate rise in prices in response to a weakening of the rouble against the dollar is 0.18% (equation 1). Interest rates and industrial production are statistically insignificant. Overall, the ECM confirms the results of the VECM.

Conclusion

An empirical analysis of the CBR monetary policy transmission mechanism indicates relatively quick pass-through of exchange rate shocks to inflation. A 1% depreciation of the rouble against the US dollar generates a roughly 0.5% rise in prices over a two-year time frame. A weakening of the nominal effective exchange rate of the rouble affects consumer price inflation only marginally.⁵ The results demonstrate that the exchange rate channel is functional. The pass-through of monetary aggregate growth to inflation is slower than that of the exchange rate shock, especially during the first six months. The regulatory function of interest rates remains statistically insignificant according to the empirical results. Contrary to expectations, an increase in interest rates generates a rise in inflation and a substantial decline in economic activity. The insignificance of interest rates does not mean, however, that inflation targeting cannot be recommended to Russia. Rather, it shows that the CBR's policy intention to strengthen the functioning of the interest rate channel is correct, as the preparations for, and subsequent introduction of, fully fledged inflation targeting may directly affect the existing monetary policy transmission mechanism. The conclusions of both models should be interpreted with caution given the volatility of the time series and the sensitivity of the results to the econometric specification, number of lags and time period chosen.

References

- Arnoštová, K. and J. Hurník, (2005): The Monetary Transmission Mechanism in the Czech Republic (Evidence from VAR analysis), CNB Working Paper 2005/04.
- Basu, R., G. Kamber, H. Takizawa and H. Zebregs (2007): Understanding Russia's Inflation in the Post-1998 Crisis Period, in Russian Federation: Selected Issues, IMF Country Report No. 07/352.
- Beck, R. and G. Barnard (2009): Towards a Flexible Exchange Rate Policy in Russia, OECD Economic Department Working Paper No. 744.
- CBR (2011): Guidelines for the Single State Monetary Policy in 2012 and for 2013 and 2014, The Central Bank of the Russian Federation, approved by the Bank of Russia Board of Directors on 28 October 2011.
- Dobrynskaya, V. (2008): The Monetary and Exchange Rate Policy of the Central Bank of Russia under Asymmetrical Price Rigidity, *Journal of Innovation Economics*, **1**, pp. 29–62.
- Ignatiev, S. (2003): Denezhno-kreditnaia politika CB RF, *Ekonomika Rossii: XXI vek*, **12** (in Russian).

⁵ The results of the empirical model can be compared with the transmission of shocks to consumer prices in the Czech Republic, which is a small open economy but has more than ten years' experience with inflation targeting. A VECM identical to the model described in section 2 indicates a statistically significant decline in Czech inflation as a result of a tightening of monetary policy, confirming the credibility of that policy and the anchoring of inflation expectations. The transmission of an exchange rate shock to inflation is relatively fast and reflects the functioning nature of the exchange rate channel, although the strength of the response does not exceed 0.25%. A relatively weak response of consumer prices to an exchange rate shock (i.e. much lower than 1 and often close to 0) is a standard result for inflation-targeting countries (see Taylor, 2000). On the other hand, the large share of imported goods in the consumer basket precludes a close-to-zero response of prices to exchange rate shocks.

- Ito, K. (2009): The Russian Economy and the Oil Price: A Co-integrated VAR Approach, *Transition Studies Review*, **16**(1), pp. 220–227.
- Kataranova, M. (2010): Sviaz mezhdru obmennym kursom i inflaciej v Rossii, *Voprosy Ekonomiky*, **1**, pp. 44–62 (in Russian).
- Korhonen, I. and P. Wachtel (2006): A Note on Exchange Rate Pass-Through in CIS Countries, *Research in International Business and Finance*, **20**(2), pp. 215–226.
- Mallick, S. K. and R. M. Sousa (2011): Inflationary Pressures and Monetary Policy: Evidence from BRICS Economies, paper presented at the Conference on Macro and Financial Economics: Theory and Applications, Brunel University.
- Mojon, B. and G. Peersman (2001): A VAR Description of the Effects of Monetary Policy in the Individual Countries of the Euro Area, ECB Working Paper Series 092.
- Salickyj, I. (2010): Perenos obmennogo kursa rublia v ceny importa Rossijskoj Federaci, *Ekonomiceskaia politika*, **1**, pp. 1–22 (in Russian).
- Shmykova, S. V. and K. A. Sosunov (2005): Vliianie valiutnogo kursa na potrebitelskie ceny v Rossii, *Ekonomiceskyj zhurnal VSE*, **9**(1), pp. 3–16 (in Russian).
- Stavrev, E. (2003): The Pass-Through from the Nominal Exchange Rate to Inflation, in Russian Federation: Selected Issues, IMF Staff Country Report No. 03/148.
- Taylor, J. (2000): Low Inflation, Pass-Through, and the Pricing Power of Firms, *European Economic Review*, **44**(7), pp. 1389–1408.

BOFIT	Bank of Finland Institute for Economies in Transition
CB-CCI	Conference Board Consumer Confidence Index
CB-LEII	Conference Board Leading Economic Indicator Index
CBOT	Chicago Board of Trade
CF	Consensus Forecasts
CN	China
CNB	Czech National Bank
DBB	Deutsche Bundesbank
DE	Germany
EA	euro area
EC	European Commission
ECB	European Central Bank
EC-CCI	European Commission Consumer Confidence Indicator
EC-ICI	European Commission Industrial Confidence Indicator
EIU	The Economist Intelligence Unit database
EU	European Union
EUR	euro
EURIBOR	Euro Interbank Offered Rate
Fed	Federal Reserve System (the US central bank)
FRA	forward rate agreement
GBP	pound sterling
GDP	gross domestic product
CHF	Swiss franc
ICE	Intercontinental Exchange
IFO	Institute for Economic Research
IFO-BCI	IFO – Business Climate Index
IFO-CCI	IFO – Consumer Confidence Index
IMF	International Monetary Fund
IRS	Interest rate swap
JPY	Japanese yen
LIBOR	London Interbank Offered Rate
N/A	not available
OECD	Organisation for Economic Co-operation and Development
OECD-CLI	OECD Composite Leading Indicator
UoM	University of Michigan
UoM-CSI	University of Michigan Consumer Sentiment Index
US	United States
USD	US dollar

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