Negative bond term premia – a new challenge for Polish conventional monetary policy[1]

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Abstract

While the euro area ponders another round of quantitative easing, Poland's monetary policy remains stubbornly conventional. Although the NBP's Monetary Policy Council has delivered a monetary easing cycle, policy rates in Poland remain above those of many peers, most notably the largest trading partner – the euro area. In this paper we seek to explain the motives behind the NBP's strategy, presenting the views on price stability and economic growth developments that shape short-term rate policy. In addition, we argue that – amid exceptionally low inflation and the euro area's relaxed monetary policy – the range of interest rates in a small open economy is not fully dependent on the domestic level of short-term rates. More specifically, using a formal term structure model, we show that Poland's bond term premium has been driven to negative levels by yield-hungry foreign investors in the context of a restricted supply of short-term Treasury paper and reduced uncertainty about the future path of short-term rates. As a result, long-term yields have fallen below the expected path of future short-term rates, adding to the monetary stimulus even as policy rates remain unchanged.

Keywords: Monetary policy independence, small open economy, term premium

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1. Issue of monetary policy independence

The recent financial crisis and the subsequent unprecedented easing of monetary conditions by major central banks has prompted an ongoing debate about monetary policy spillovers from advanced to emerging market economies (EMEs). Old questions about the preconditions for monetary policy independence – that once seemed to have been settled – are now being revisited. One view voiced in these discussions is that, given the scale of financial globalisation, global liquidity conditions have generated a cycle to which EMEs must simply adjust (Edwards (2015); Rey (2015)). Monetary policy independence is thus "an illusion", even for countries pursuing fully floating exchange rate regimes. As a result, we should expect small open economies to set policy rates that accord with those of the major central banks.

With this point in mind, we review evidence from Poland over the past few years. At first glance, the Polish monetary policy should track ECB decisions. First, Poland's GDP path is highly correlated with the European business cycle. Second, the single European market transmits impulses via the foreign trade channel that influence not only industrial production and employment, but also the price level. The observed price convergence process has linked the Polish inflation index with European price movements. Third, the common rules of the single European market, while boosting the flow of goods, labour and capital, exclude capital control instruments. Therefore, interest rate differences should fuel the free float of financial capital affecting exchange rates.

We will argue that, although Poland's monetary authorities have observed other central banks' actions – especially those of the ECB – the NBP's monetary policy has been shaped mainly by inflation prospects and changes in the output gap. Hence the direction of the Polish central bank's interest rate changes has been consistent with the ECB's interest rate adjustments due to a similar process of decreasing inflation rates both in Poland and the euro area. On the other hand, domestic macroeconomic conditions shaped the level of NBP's interest rate. Finally, the Polish interest rate has been stabilised on a slightly higher level than the ECB's rate.

2. The thinking behind the NBP's monetary policy decisions in 2014 and 2015

Faced with abruptly falling inflation in 2014 and 2015, the NBP had to decide on the sources and persistence of the shock, as any inflation targeting central bank must do in such circumstances. This is never an easy task ex ante. Several considerations seem to have played a role in guiding the MPC's thinking.

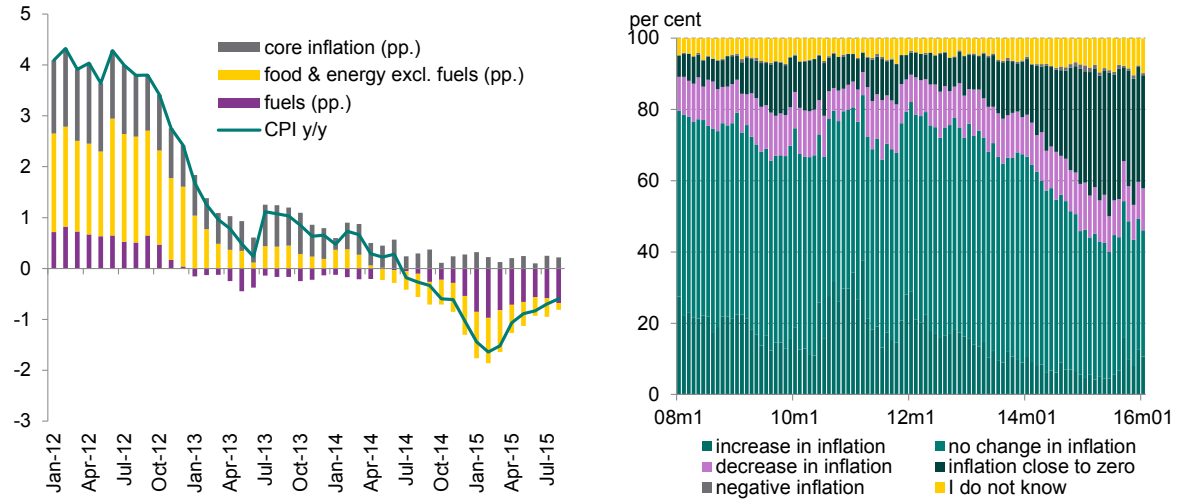
First, deflation in Poland has been seen as primarily the effect of a positive supply shock related to falling commodity prices, particularly oil (by 75% between June 2014 and January 2016), amid ample supply and weak global demand growth (Graph 1, left-hand panel). In the case of Poland, the direct impact of falling oil prices on CPI inflation amounted to –0.5 pp on average between July 2014 and August 2015, ie when headline inflation averaged –0.8% year on year. However, accounting for the indirect effects that reduced oil prices may have had on inflation, through lower costs for firms and higher household disposable income, suggests that the overall impact of oil prices on headline inflation could have been as high as –1.1 pp (at its peak in

the third quarter after the oil prices drop). The textbook monetary policy response to a supply shock[5] consists in weighing the risks that deflation may pose to the central bank's reputation and inflation expectations against its positive impact on GDP growth.

Second, deflation has not created deflationary expectations in the business and household sectors. Even though an increasing share of households expects prices to remain at the current level, there has been no increase in the anticipation of deflation in the next 12 months (Graph 1, right-hand panel). At the same time, the majority of surveyed households expects positive inflation, which has fuelled positive real growth in retail sales. Thus, the current deflation has neither induced additional household saving nor undermined consumer confidence. Therefore, the information gathered confirms that inflation expectations are well anchored and should not weaken the NBP's reputation.

The decomposition of the inflation rate in Poland in 2012–15 (left-hand panel) and the structure of households' inflation expectations

Graph 1



Source: NBP data.

Third, Poland's GDP exhibited stable growth throughout 2014–15 at a rate of roughly 3.5%, close to its potential, and was expected to remain at this level in 2016 and 2017. As a result, the output gap is close to zero and is expected to remain so in 2016 and 2017. This stands in contrast to the persistently negative output gap in the euro area (Graph 2, left-hand panel), which called for further monetary easing in this economy (Graph 2, right-hand panel). Adding to the robustness of the Polish economy, the unemployment rate fell to single-digit levels by early 2015 and nominal wages have kept growing at a solid pace which – together with persisting deflation – further increased households' purchasing power in real terms. Furthermore, there were no signs that corporate profits suffered a negative impact from deflation, as

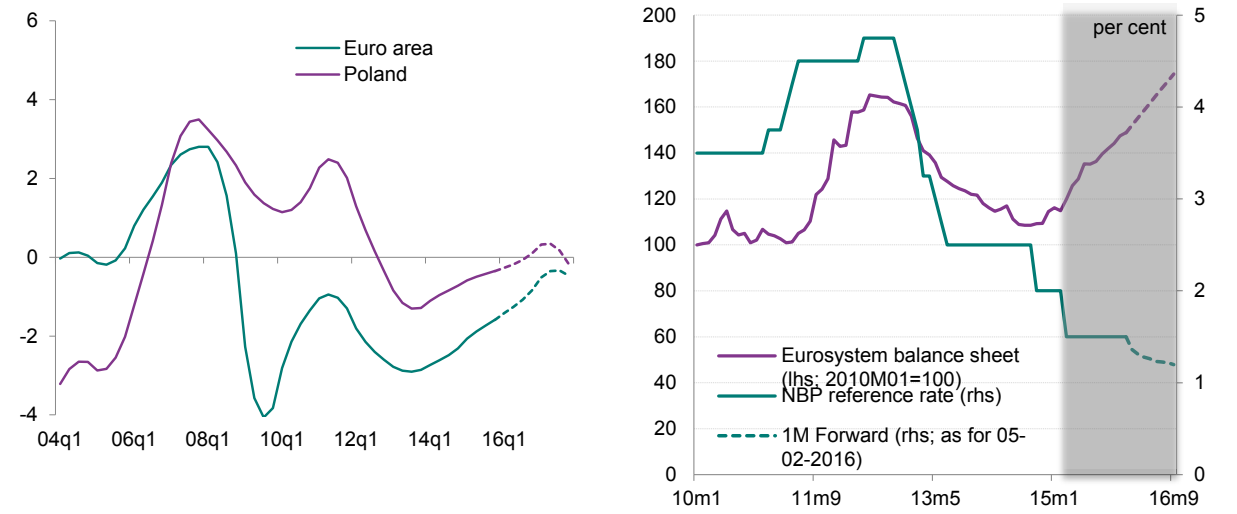
[5] See eg Rosengreen (2011) for an elaboration on the impact of supply shocks on the US economy and Fed policy.

firms seemed to be able to offset falling merchandise prices by proportionate cuts in production costs.

Against this background, the MPC decided to end its monetary easing cycle in March 2015. Over and above the mostly supply-shock nature of deflation and stable GDP growth, the decision not to pursue further cuts also reflected the intention to prevent the potential build-up of imbalances in the Polish economy that might have taken place if interest rates had been set too low.[6] The MPC also seemed to believe that not cutting rates any further would leave it better placed in the event of a major adverse external shock.

Output gap in Poland and in the euro area (left-hand panel), NBP interest rates and the Eurosystem balance sheet

(expanded asset purchases are depicted by the grey background; right-hand panel) Graph 2



Sources: NBP; Ameco; Bloomberg.

Despite reaching historical lows, interest rates in Poland are still higher than those of many peers – most notably the major trading partner, the euro area. In fact, towards the second half of the year, the divergence in the degree of monetary easing between the ECB and NBP became even more pronounced in the face of hints from some ECB Governing Council members that QE could be adjusted to provide more stimulus (Graph 2, right-hand panel). This raises a natural question as to why the NBP's policy of keeping a positive interest rate differential vis-à-vis the euro area wasn't self-defeating. According to the standard macroeconomic framework, a significant difference in the monetary policy stance between a small open economy and the "rest of the world" poses the threat of a rapid inflow of short-term portfolio capital that might lead to excessive currency appreciation and credit and asset price booms.

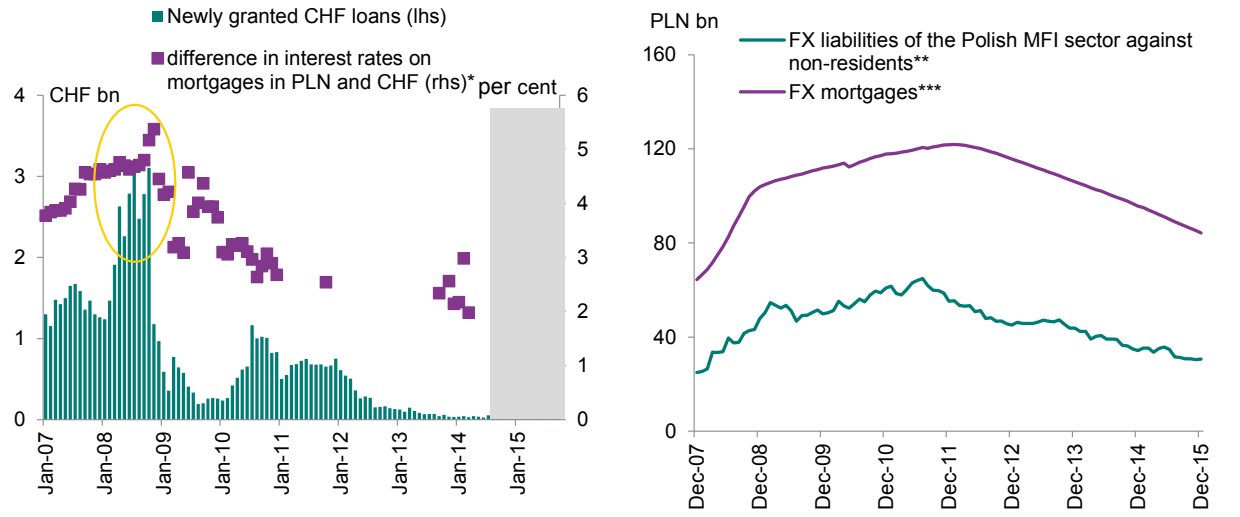
[6] See www.voxeu.org/article/low-interest-rates-secular-stagnation-and-debt.

3. Foreign financing inflow undercuts the effectiveness of domestic monetary policy (Polish case 2007–08)

In fact, the above-mentioned scenario did play out in Poland in the years 2007–08. During this period, households were induced to take out Swiss franc-denominated mortgages by the positive interest rate differential between short-term interest rates in the Polish zloty and the Swiss franc coupled with expectations of convergence-driven appreciation of the zloty (Graph 3; left-hand panel).[7] In effect, FX loans were the vehicle of a carry trade arranged by domestic banks. The Swiss franc mortgages were refinanced mostly by banks borrowing short-term from parent banks abroad (see Graph 3, right-hand panel). The disbursement and repayment of mortgages were in Polish zloty. Hence, domestic banks that borrowed funds abroad had to convert foreign currency into Polish zloty. These F/X operations involved a significant appreciation of the Polish zloty, which accelerated the mortgage boom.

FX mortgage boom in Poland (left-hand panel; the period when FX loans were banned for households with PLN income is depicted by the grey background) and its foreign-currency funding (right-hand panel)

Graph 3



Notes: * series limited due to data availability. ** levels are presented at the exchange rate from January 2004. *** liabilities in currencies other than EUR and PLN.

Sources: NBP; Bloomberg.

The strong appreciation of the zloty fuelled by the credit boom led many exporters to hedge the risk of further appreciation via FX options. However, to avoid paying the protection premium, corporates often entered zero-cost strategies,

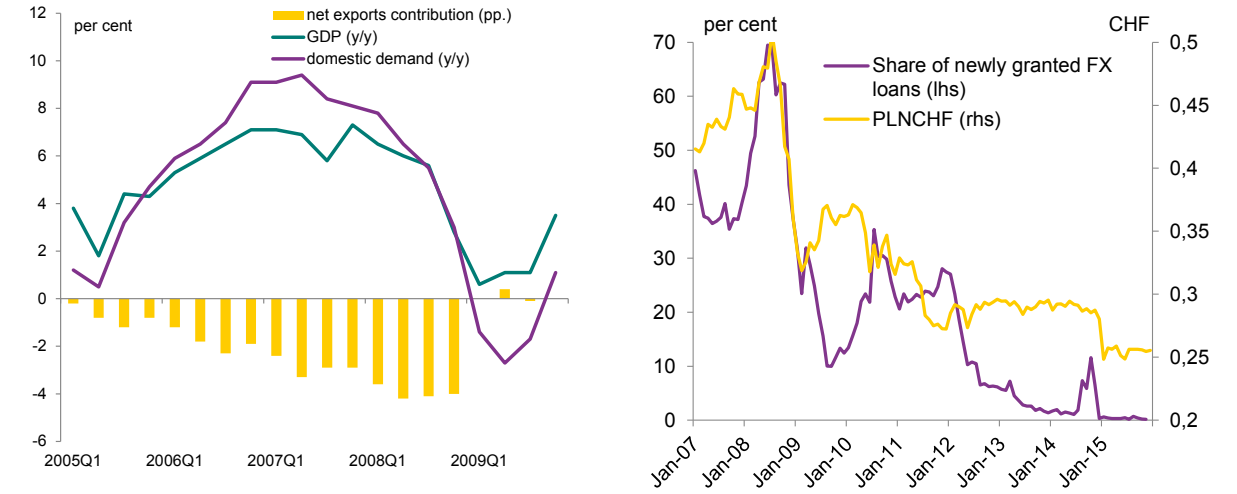
[7] Although mortgages were long-term loans, the interest rate formula was floating and calculated on the basis of short-term interest rates (domestic or Swiss base rate). Therefore, the interest rate of the mortgage loan equals the short-term interest rate plus a fixed margin as appropriate for the credit risk.

whereby they would purchase a put and at the same time write a call, thus synthetically creating exposures with potentially unlimited downside in the case of zloty depreciation.[8] In other words, instead of hedging their FX risk, some corporates turned to speculating on currency movements. Although the banks that sold option contracts to corporates typically closed the positions back-to-back, and hence assumed no market risk, they nonetheless retained credit exposure against the purchased options and their corporate customers' ability to meet their obligations.

These developments in household and corporate balance sheets illustrated a severe weakening of the effectiveness of domestic monetary policy. Indeed, when in 2007 burgeoning inflation forced the NBP to increase its main policy rate from 4% to 6%, the zloty appreciated against the euro by about 50% between April 2007 and June 2008. While this should have brought about a tightening of domestic monetary conditions, it also widened the interest rate differential between the PLN and CHF, clearly increasing the incentive to substitute FX-denominated lending for PLN-denominated lending (Graph 4; right-hand panel). The net result was that, although the sale of PLN-denominated mortgage loans had slowed considerably, as one would have expected, the sale of FX-denominated loans kept rising until mid-2008, providing further fuel for residential property prices, the boom in domestic demand and external imbalances (Graph 4; left-hand panel).

Economic boom in 2005–08 (left-hand panel) and newly granted FX mortgages after 2007 (right-hand panel)

Graph 4



Sources: NBP; Eurostat; Bloomberg.

Even though the Polish Commission for Banking Supervision warned against the risks associated with FX mortgages as early as 2005, it was not able to limit the extension of new mortgage loans effectively until exchange rate risks materialised

[8] What made the synthetic forward positions speculative was that the value of the written option (call) was larger than the value of the purchased option to guarantee a more favourable strike price in the put. Sometimes the nominal of the written option was even higher than the expected currency income of an enterprise.

after the collapse of Lehman Brothers. The subsequent strong depreciation of the zloty increased the instalments on FX loans and depressed the valuation of companies' options portfolios, weakening the balance sheets of both corporates and households.

The positive aspect of these misadventures was to provide political space for more decisive action against FX-denominated lending. This helped produce a regulatory framework that put an effective curb on FX lending by imposing LTV caps as well as a 100% risk weight on FX-denominated mortgages, and strongly discouraging the extension of FX loans to entities without a natural hedge, such as, for example, a stable source of income in that currency. Regulatory changes, along with the previous costly experiences with FX derivatives, have also fuelled firms' aversion towards unhedged FX loans or options. In fact, corporate demand for options has all but evaporated, as reflected in the fact that the value of transactions in OTC FX options involving the zloty significantly lags behind regional peers, despite the fact that Poland has overall the deepest and most liquid FX market in the region (Table 1).

Average daily turnover in foreign currency spot and option markets in CEE

USD millions Table 1

	PLN	HUF	CZK
Spot	10759	7379	5874
FX options	70	75	92

Sources: NBP; BIS.

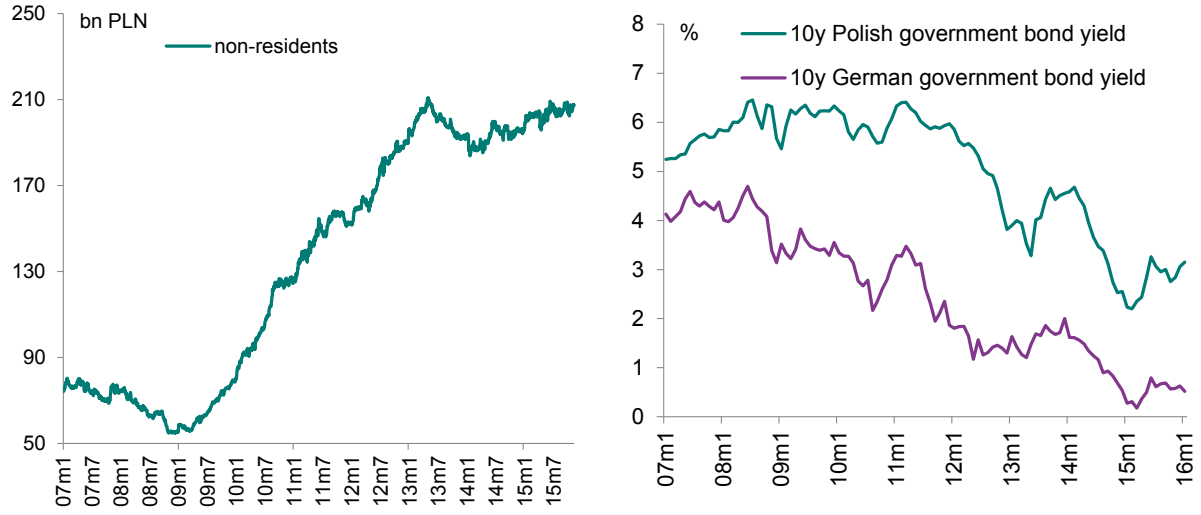
These factors go a long way towards explaining why the MPC, in its recent episode of monetary policy easing, may have felt relatively comfortable with leaving a positive policy rate differential against the euro. The main channel via which foreign capital – attracted by a positive interest rate differential – could have flowed into the Polish economy had been effectively blocked, and as a result, a slightly higher interest rate than the ECB's was unlikely to lead either to excessive monetary tightening (through exchange rate appreciation) or unhealthy credit expansion.

4. Impact of a recent external vs internal basic interest rate disparity on long-term interest rates

Yet another factor complicated the conduct of conventional monetary policy in Poland amidst monetary easing in the euro area and the stable zloty exchange rate – namely additional easing delivered by the flattening of the yield curve and the decline in government bond yields.

To see this, note that the short-term interest rate differential has fed through to the entire term structure of interest rates, resulting in a spread of almost 300 bp between the five-year Polish government bond yield and that of a corresponding German bund (Graph 5, right-hand panel). Since the CDS spread on Polish sovereign debt has averaged around 75 bps since the beginning of 2013, with the realised 90-day volatility of EURPLN averaging below 9 points throughout that time, exposure to Polish government bonds was also attractive on a risk-adjusted basis. In the face of a clogged credit channel, this provided incentives for portfolio capital inflows directed not towards the banking sector – as had been the case in the run up to the global financial crisis – but rather towards the Polish government bond market. Over and above the attractive risk-return characteristics, Polish sovereign debt was included in major global bond indexes, often treated as benchmarks by global investors, in particular the so called real money ones. Thus, over the past six years, the value of non-residents' portfolios of Polish government bonds has increased almost fourfold and experienced only a modest fall – by international comparison – driven by spikes in risk aversion following the so-called taper tantrum and the subsequent deterioration of China's economic prospects (Graph 5, left-hand panel).

Non-residents' portfolio of Polish government bonds (left-hand panel), yields on 10-year Polish and German government bonds (right-hand panel) Graph 5



Sources: Ministry of Finance; Bloomberg.

The continued strong presence of foreign investors in the Polish sovereign debt market has clearly impacted valuation, with yields on a benchmark five-year bond declining since mid-2012 by over 300 bps, ie roughly on par with the total of policy rate cuts delivered by the MPC in that easing cycle. The economic impact of low long-term interest rates was acute. First, interest payments on government debt fell to 2.0% of GDP in 2014 and are set to fall further, to as low as 1.6% of GDP, according to European Commission estimates. The material decline in debt service costs translated into a fall of the government debt-to-GDP ratio in 2014 (via the negative contribution of the so-called snowball effect), providing the government with more fiscal space, should the policy mix call for it. Importantly, lower government bond yields have also translated into lower borrowing costs for enterprises whose debt is priced off the

government yield curve (assumed to be risk-free). The mid-term benefits should not be a reason to accept a long-term risk. We need to assess if foreign capital inflows into the treasury market may undermine domestic monetary policy and create a substantial financial stability risk, as did the foreign currency mortgage boom previously. A good measure of a potential yield adjustment is an estimation of the negative bond term premium which is presented below.

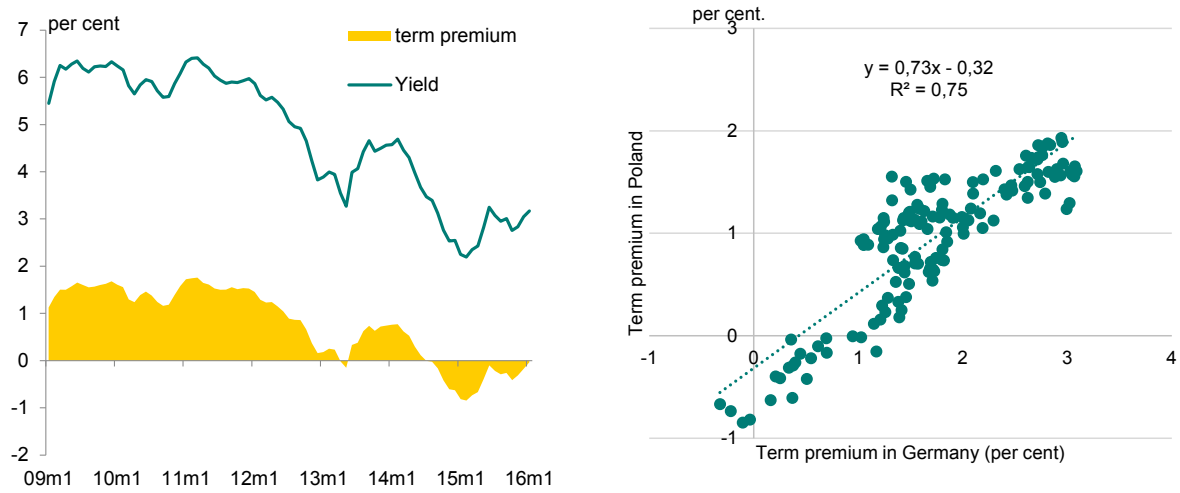
5. Negative bond term premium as a signal of monetary policy constraints

According to the expectations hypothesis, long-term nominal interest rates can be decomposed into two major elements: the expected path of future short-term rates and the risk premium. The most important component of the latter is likely to be the term premium, ie the additional compensation that investors expect for taking on the risk that interest rates do not evolve as predicted by the given term structure of interest rates. Conceptually, then, the above-mentioned decline in Poland's long-term interest rates could have resulted from a lowering of the path of future expected short-term rates or a fall in the term premium, or some combination of the two. Accordingly, two distinct economic narratives could be used to explain the historically low level of these government bond yields. The first one assumes that low yields reflect a worsening outlook for the Polish economy amidst the disappointing recovery in the euro area and foresees further cuts of the NBP policy rate along the way. The second explanation assumes that the reduced yields are associated less with domestic conditions than with the exogenous impact of the QE programmes conducted by the ECB and other major central banks, which led to a repricing of global safe assets and – via so-called portfolio effects – also EM assets. According to this view, although low long-term interest rates in Poland can be regarded as a monetary easing similar to those orchestrated by the major central banks through QE programmes, they were to a large extent imported from abroad.

To verify which hypothesis is more likely to be correct, we build a model of the Polish yield curve based on the methodology described in Adrian et al (2013). We then extract the term premium and the expected average short-term interest rate components from fitted government bond yields (Graph 6, left-hand panel). The results of this exercise suggest that, although the path of expected short-term interest rates has fallen since 2010, the term premium has also significantly decreased, even reaching negative values in recent quarters. As a result, nominal bond yields are below the level implied by the expected path of future short-term rates. In the second step, we calibrated our term structure model to German government bond yields, obtaining an analogous decomposition of long-term rates into the expected short rate component and the term premium. We then regressed the term premium contained in 10-year Polish government bonds on that extracted from the 10-year bund (Graph 6, right-hand panel). This in turn confirmed our initial hunch that developments in Polish term premia have to a large extent – and especially so after the outbreak of the recent crisis – been driven by the evolution of term premia in the euro area.

Government bond yields decomposition (left-hand panel) and the relationship between term premium in yields on Polish bonds and German bunds* (right-hand panel)

Graph 6



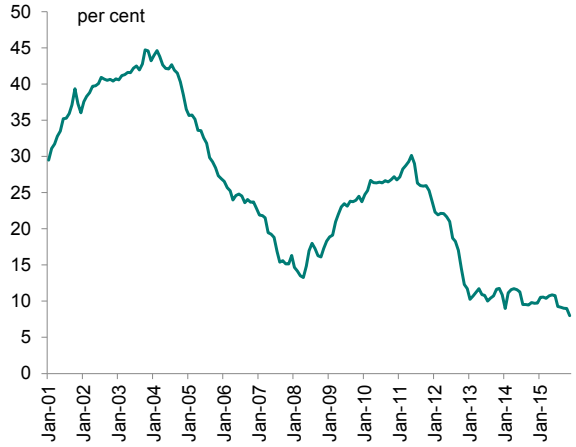
Note: * term premia obtained from estimations based on Adrian et al (2013).

Sources: Bloomberg; authors' calculations.

The negative term premium may be perceived to be at odds with basic economic intuition, as it implies that investors are willing to pay to bear the interest rate risk inherent in Polish long-term government bonds. However, such a perspective applies primarily to domestic long-term investors, who may arbitrage between holding a long-term asset and rolling over short-term ones – which should prevent the term premium from falling below zero. In the case of foreign investors – who hold roughly 40% of the local government bond market – foreign yields and expectations about exchange rate changes abroad seem to be a more important yardstick than the expected path of domestic short-term rates. Moreover, investors – foreign and domestic alike – may find it difficult to arbitrage between the expected path of Poland's short-term rates and long-term rates, given the limited supply of short-term Treasury bills. This is due mainly to the government's continuous efforts to extend the duration of public debt, which have reduced the share of short-term Treasury bills and zero coupon bonds from 45% in early 2004 to below 10% (Graph 7). Thus, if investors want to invest in low-risk zloty-denominated assets, longer-term sovereign bonds are "the only game in town".

The share of short-term bills and zero coupon bonds in total outstanding stock of Polish government debt

Graph 7



6. Yield curve flattening as a risk to financial stability

The reasoning presented so far allows us to draw the following conclusion: the decrease in the euro area yields, in particular those of German bunds, has induced Poland's long-term interest rates to fall far below (up to 1 percentage point) what might be expected from domestic economic conditions. This was facilitated by the significant presence of foreign investors in the domestic bond market, particularly since 2009, ie when the major central banks launched their QE programmes.

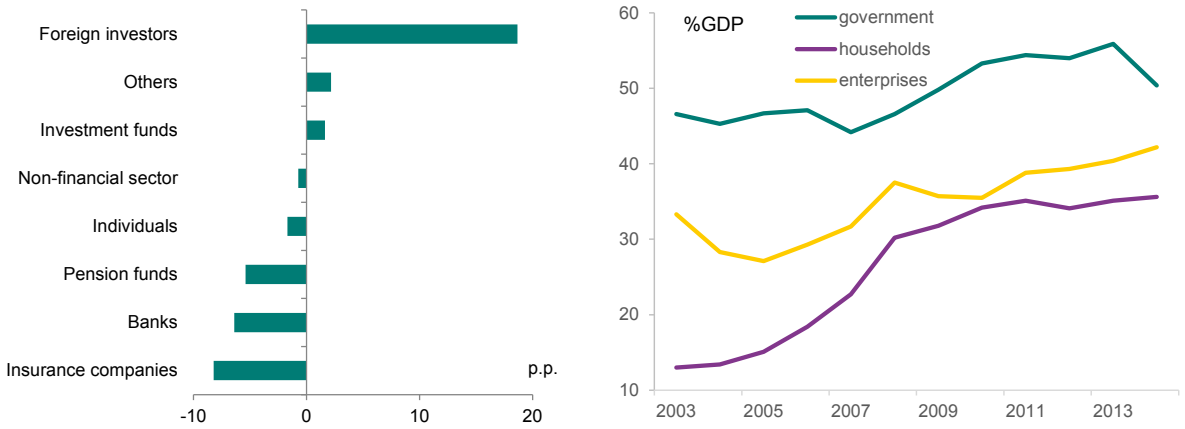
These circumstances define the extent of monetary policy independence under which the NBP – but possibly also other central banks in EMEs – had to operate: the MPC could remain conservative and refrain from cutting policy rates all the way down to zero, because additional easing was imported from abroad through changes in government bond yields. Claro and Opazo (2015) report a similar conclusion for Chile, arguing that, post-crisis, the correlation between Chile's short-term interest rate and those in developed countries has essentially broken down, while correlations between long-term interest rates have materially increased. We believe this pattern has resulted from the co-movement in bond term premia between emerging and developed markets.

Although the inflow of foreign financing has not undermined the NBP's autonomy in steering its short-term rates and has built in a potential decrease in treasury yields, the main question is the outcome of future monetary policy tightening by leading central banks. Should Polish authorities worry about such a scenario?

Foreign investors increased their share in total Polish government bond holdings (Graph 8, left-hand panel), thus freeing up domestic banks' capacity to provide credit to the private sector (Graph 8, right-hand panel). In the event of an abrupt outflow of foreign investors from the treasury bond market, domestic banks would have to take their place, encouraged by lower bond prices. However, banks' growing bond portfolios could potentially discourage them from lending to the private sector. In other words, credit would be "crowded out" of the economy by treasury bonds.

Changes in share in the secondary bond market between December 2008 and December 2013 (left-hand panel) and public and private sectors' debt in Poland (right-hand panel)

Graph 8



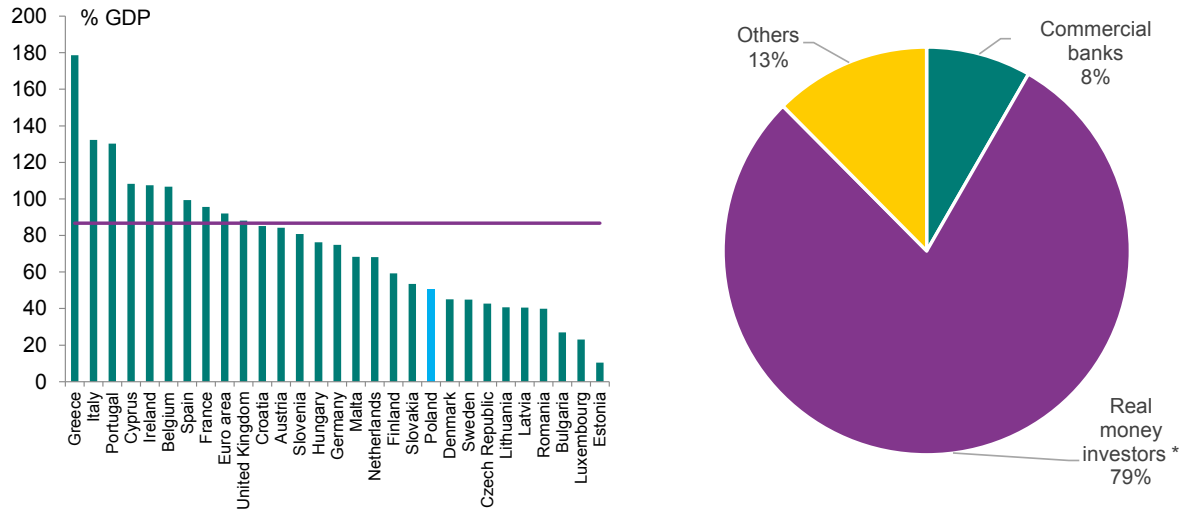
Sources: Eurostat, Polish Ministry of Finance.

The current free float exchange rate framework should mitigate foreign investor outflows. The expected exchange rate losses could slow the pace of bond selling by foreign investors. Therefore, the potential outflow should be gradual rather than a sharp collapse.

Furthermore, the government debt is held mainly by real money investors, who are perceived as a stable source of financing (Graph 9, right-hand panel). This implies that there is little risk of a sudden capital outflow from the government bond market.

So far, prudent fiscal policy has not undermined the confidence of foreign investors. Financial inflows to the government bond market have not led to a substantial increase in public debt (Graph 8, right-hand panel), which is still below the EU average (Graph 9, left-hand panel).

Debt-to-GDP ratio in European economies (left-hand panel) and structure of secondary Polish government bonds market (right-hand panel) Graph 9



Note: *The category "Real money investors" comprises central banks, public institutions, insurance companies, and pension and investment funds.

Sources: Eurostat, Polish Ministry of Finance.

To sum up, the short-term interest rate differential did not lead to the build-up of economic imbalances, as was the case in 2007–08. However, the risk of an abrupt outflow of foreign financing from the treasury bond market may materialise in the event of a rapid deterioration of confidence in Polish fiscal policy, or such outflows could be sparked by a fast and unexpected tapering of the ECB's monetary policy.

References

Rey, H (2015): "Dilemma not trilemma: the global financial cycle and monetary policy independence", *NBER Working Paper*, no 21162, National Bureau of Economic Research.

Edwards, S (2015): "Monetary policy independence under flexible exchange rates: An illusion?", *The World Economy*, vol 38, no 5, pp 773–87.

Claro, S and L Opazo (2014): "Monetary policy independence in Chile", *BIS Papers*, no 78.

Adrian, T, R Crump and E Moench (2013): "Pricing the term structure with linear regressions", *Journal of Financial Economics*, vol 110, no 1, pp 110–38.