The level of the countercyclical capital buffer rate in Poland

A study prepared for a meeting of the Financial Stability Committee

Warsaw, May 2023

Executive summary

This study is a compilation of information for the purposes of assessing the intensity of cyclical systemic risk and the level and adequacy of the countercyclical capital buffer (CCyB) rate recommended by the Financial Stability Committee.

External risks to financial stability are still elevated. The global economic and inflation outlook remains uncertain. Negative external economic developments, coupled with nominally high interest rates in Poland, contribute to constraining the real growth of credit in all credit categories but credit to non-financial corporations by non-monetary financial institutions. In consequence, the ratio of credit to the private non-financial sector to GDP continues its fall, which started in 2017. Under these circumstances, there is no rationale for determining the CCyB at a rate higher than 0%.

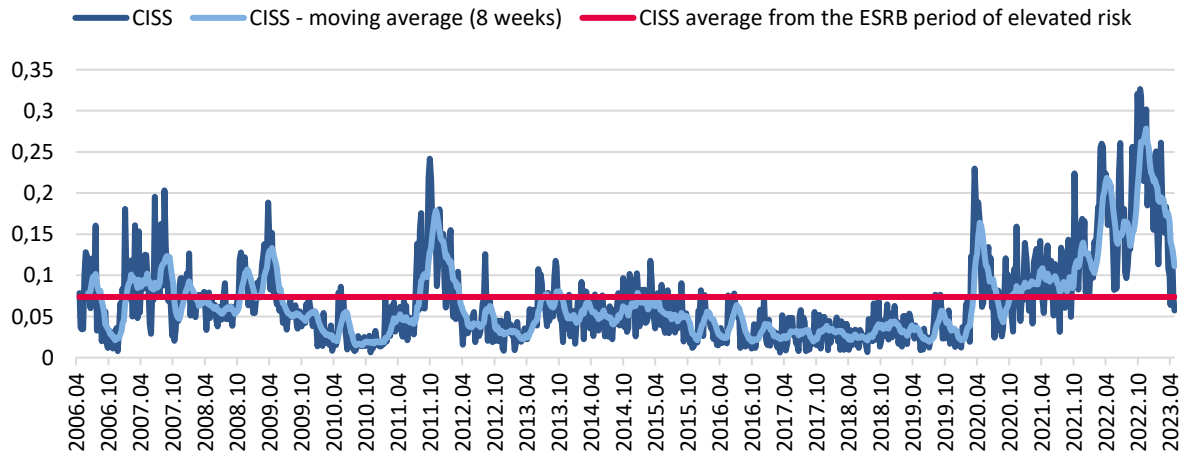
This study presents information on the intensity of cyclical systemic risk, including indicators recommended by the European Systemic Risk Board for determining the level of the countercyclical capital buffer. The study is divided into three parts. **Part 1** deals with an assessment of macroeconomic developments and strains within Poland's financial system. **Part 2** presents the time course of credit gap values and other variables that illustrate lending in Poland, the monitoring of which is recommended by the ESRB. **Part 3** shows the results of early warning models.

1. Macroeconomic developments and financial system strains

External risks to financial stability are still elevated. The global economic and inflation outlook remains uncertain. Negative external economic developments, coupled with nominally high interest rates in Poland, contribute to constraining the real growth of credit.

The Composite Indicator of Systemic Stress (CISS), whose monitoring is recommended by the ESRB (ESRB/2014/1, Recommendation D, paragraph 2), has decreased substantially after remaining at an all-time high due to the COVID-19 pandemic and the war in Ukraine. However, it remains at the level corresponding to its average value from the period indicated by the ESRB as a period of elevated risk (from August 2007 to November 2009, see Figure 1). Therefore, the CISS remains elevated. This systemic stress indicator is particularly relevant when it is high and, at the same time, other indicators (among others, indicators that determine a position in the credit cycle, early warning model rates) give grounds for creating a countercyclical buffer – under such a scenario, the economy could already be in a crisis, and – consequently – creating a buffer would be unwarranted. On the other hand, an increase in the CISS to a high level in the situation when the buffer has already been created, could give grounds for releasing it. **To sum up, a high CISS indicates that the reasons for creating a buffer – even if this is indicated by other variables – are limited**.

Figure 1. Composite Indicator of Systemic Stress (CISS) in the financial system



Note: The CISS measures the current state of financial sector turmoil, reflected in market quotations. The intensity of the turmoil in a given period is interpreted here as an *ex post* measure of systemic risk. The CISS was originally

developed for the euro area[1] and is applied by the ECB and ESRB. Indicators that comprise the CISS include five areas of the domestic financial market: the equity market, the money market, the foreign exchange market, the bond market and bank stock quotations. A red line is used to mark the average CISS value from the period classified by the ESRB as a period of elevated risk (August 2007 – November 2009).
Data for the period running from 21 April 2006 to 8 May 2023.
Source: Own calculations based on Bloomberg and NBP data.

2. Position in the credit cycle and the ESRB-recommended indicators

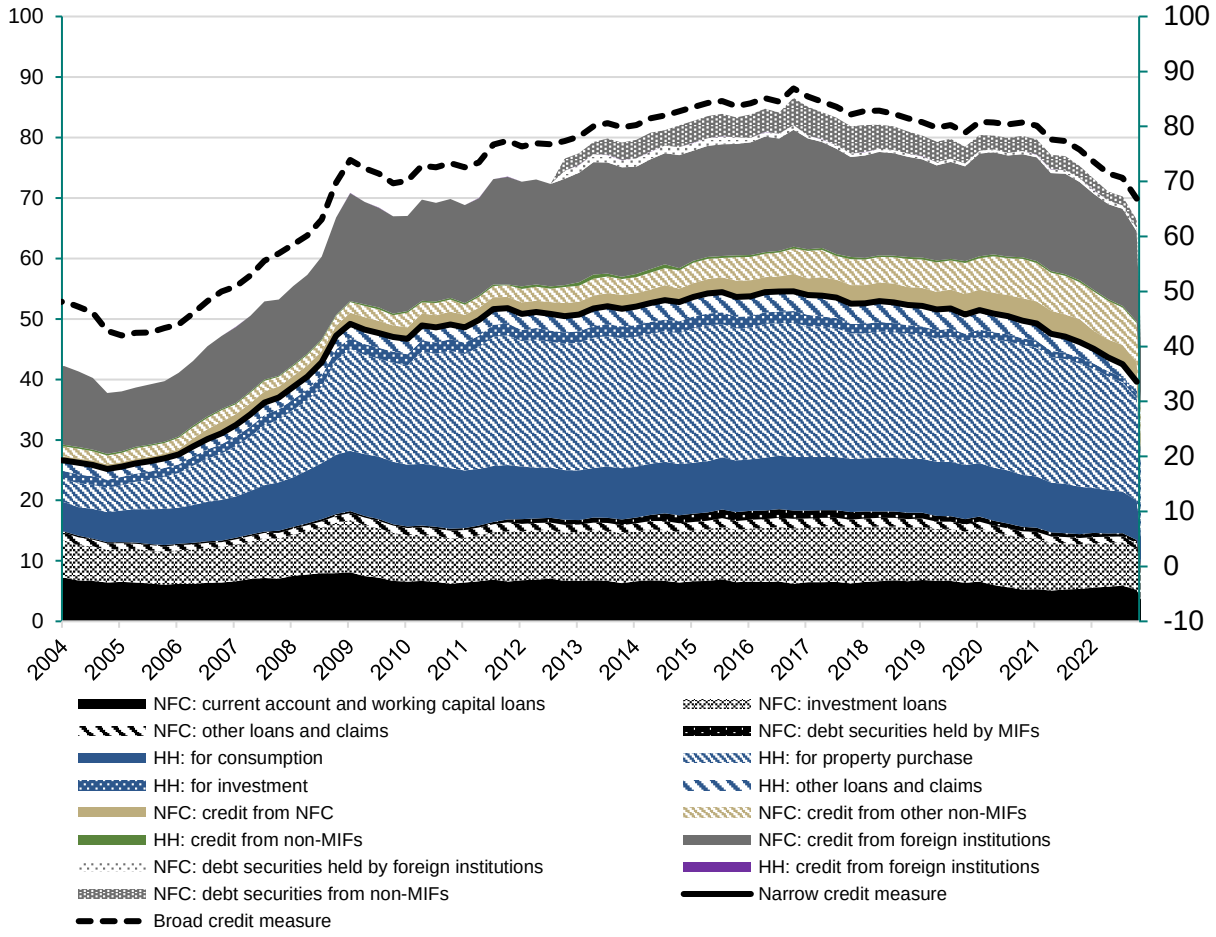
In 2022 Q4, the ratio of credit to the private non-financial sector to GDP (broad credit aggregate) amounted to 66.9%.[2] This means that the ratio has declined by 8.9 p.p. year-on-year. On the other hand, the level of private non-financial sector debt towards domestic monetary financial institutions (i.e. banks and cooperative savings and credit unions, or narrow credit aggregate) amounted to **39.6%** of GDP, which represents a decline of 6.6 p.p. year-on-year. The decline of the ratio of broad and narrow aggregates to GDP was also accompanied by a nominal decrease in the two values by 1.6% and 3,1% month-on-month, respectively.

The value of private non-financial debt relative to GDP continued its downward trend. The total debt (broad credit aggregate) relative to GDP in 2022 Q4 fell by 3.8 p.p. from 2022 Q3. In the corresponding period, debt towards banks and cooperative savings and credit unions (narrow credit aggregate) relative to GDP fell by 2.9 p.p. These substantial falls are the result of an overlap of two effects: a continued high nominal GDP growth and a nominal fall of both credit aggregates in 2022 Q4 (see Figure 2).

[1] Hollo D., Kremer M., Lo Duca M., (2012), *CISS – a composite indicator of systemic stress in the financial system*, ECB Working Paper 1426.

[2] The ratio of credit to the private non-financial sector to GDP includes debt of non-financial corporations and households due to loans and borrowings and debt securities. The ratio calculated on the basis of narrow credit measure includes debt towards banks and cooperative savings and credit unions, and additionally – on the basis of broad credit measure – debt towards other domestic non-monetary entities (among others, enterprises, financial intermediaries) and foreign entities.

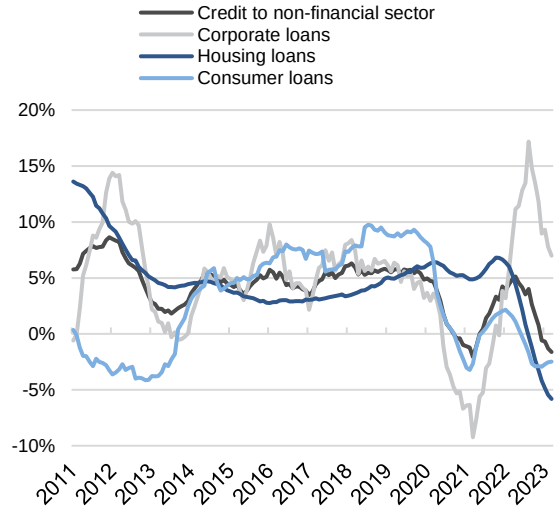
Figure 2. Breakdown of the ratio of credit to the private non-financial sector to GDP (%)



Note: Last observation for 2022 Q4. The ratio of credit to the private non-financial sector to GDP includes debt of non-financial corporations and households due to loans and borrowings and debt securities. The ratio calculated on the basis of narrow credit measure includes debt towards banks and cooperative savings and credit unions, and additionally – on the basis of broad credit measure – debt towards other domestic non-monetary entities and foreign entities. The area chart runs in some parts below a black dashed line of the credit (broad measure) to GDP ratio, because in these periods – due to missing data – debt due to debt securities was not divided into debt towards banks and cooperative savings and credit unions and debt towards other domestic non-monetary entities. In these periods, an empty area presents, collectively, debt of NFCs due to debt securities. The data that enable a detailed breakdown have been accessible since 2012 Q4. Abbreviations: NFCs stands for non-financial corporations, HH stands for households and MFIs stands for monetary financial institutions.
Source: Own calculations based on NBP data.

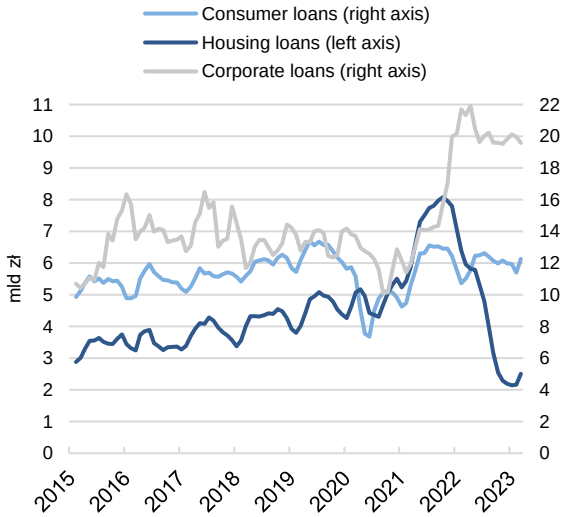
In 2023 Q1, housing and consumer loans continued their negative growth. The positive albeit slowing corporate loan growth was not sufficient to maintain the positive total growth of credit to the non-financial sector, as it fell to -1.6% year-on-year towards the end of 2023 Q1 (see Figure 3 and Figure 4).

Figure 3. Growth rate of selected categories of credit to the non-financial sector, y/y



Notes: Last observation for March 2023.
Source for (both figures): NBP.

Figure 4. Value of new loans (3-month moving average)



Notes: Under new corporate loan statistics, current loans are not included.

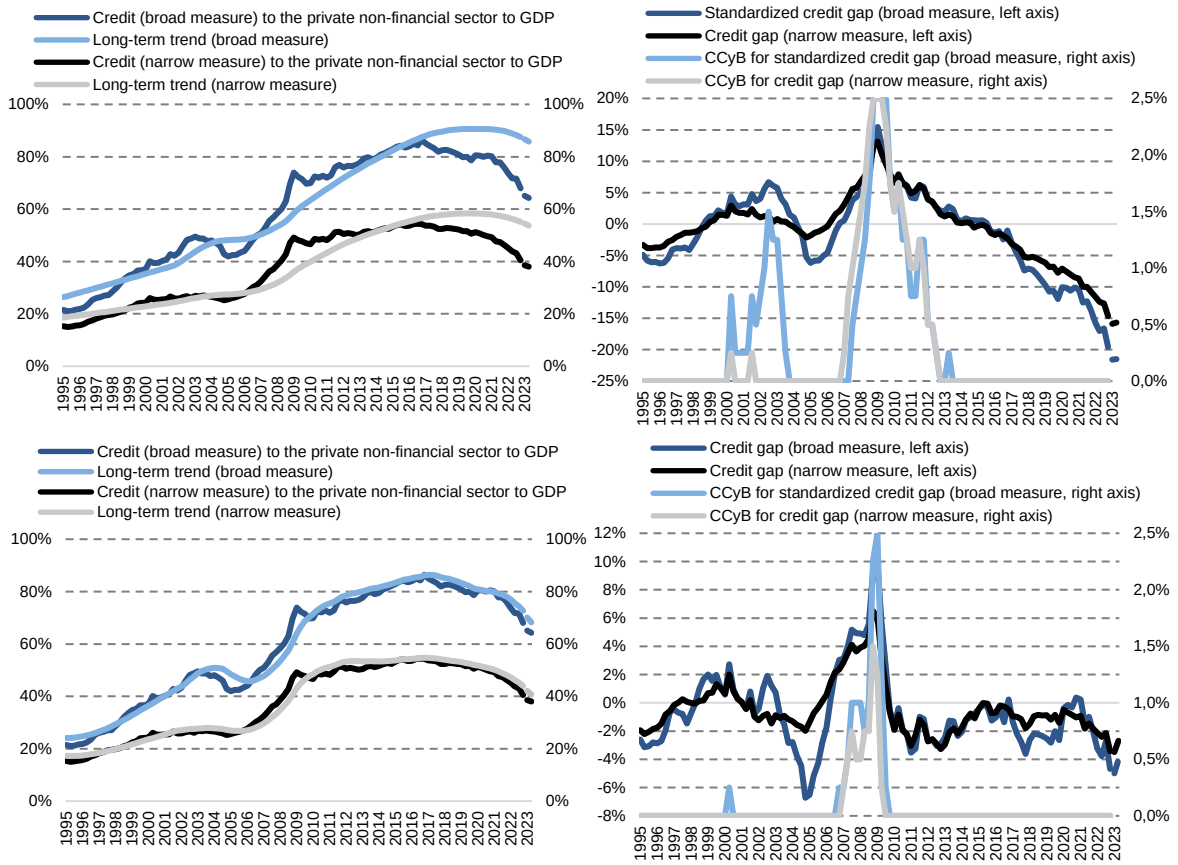
The standardized credit gap[3] was -19.6%, which indicates that there is no rationale for creating a countercyclical buffer (see Figure 5). There would be a rationale for creating it, had the gap been positive and over 2%. The credit gap calculated based on narrow credit measure is -14.7% and is also not a condition for creating a countercyclical buffer. The value of the credit gap estimated on the basis of narrow credit measure, which takes into consideration the length of the financial cycle in Poland[4], also confirms that there are no grounds for creating a countercyclical buffer – the gap was -3.4%.[5]

[3] The standardized credit gap is a deviation in the value of credit to the private non-financial sector to GDP ratio from the long-run trend. In compliance with the ESRB Recommendation (ESRB/2014/1), the long-run trend was specified using a recursive HP filter with the smoothing parameter λ=400.000, which corresponds to fluctuations lasting 20 years and more.

[4] Lenart, Ł. and Pipień, M. (2015) and Pipień, M., Wdowiński, P. and Kaszowska, J. (2018), op. cit.

[5] In this approach, the long-run trend was specified using a recursive HP filter with a parameter λ corresponding to fluctuations lasting 10.5 years.

Figure 5. Standardized credit gap (upper panel) and credit gap compliant with the length of the financial cycle in Poland (lower panel) and the corresponding buffer rate



Notes: Last real observation for 2022 Q4 and extrapolations using ARIMA models for the period 2023 Q1-Q2. Credit gap estimations were obtained using one-sided recurrent Hodrick-Prescott (HP) filter, which ensures that to calculate a trend only information available in every moment in time is used. This approach is compliant with the ESRB Recommendation (ESRB/2014/1). Estimations of the credit gap resulting from the application of a HP filter include all cycles with a frequency higher than the long-term frequency; for this reason, some fluctuations may result from cycles that are shorter than the financial cycle.
Source: Own calculations based on NBP and Statistics Poland data.

The credit gap is one of the variables that have to be considered when the decision is made to create a CCyB. Many countries also apply a modified approach by using a broader set of information. The variables whose monitoring is recommended by the ESRB (ESRB/2014/1, Recommendation C, paragraph 2) are shown in Table 1. The level of the variables, compiled in Table 1, observed in 2022 Q4 does not indicate that there is a need to change the level of the CCyB.

3. Early warning models

Indicators based on several variables are highly informative for assessing excess credit growth and the risk of a financial crisis. Therefore, the ESRB also recommends pooling various variables and the credit gap. A logit model[6] is a commonly used solution, where the variable

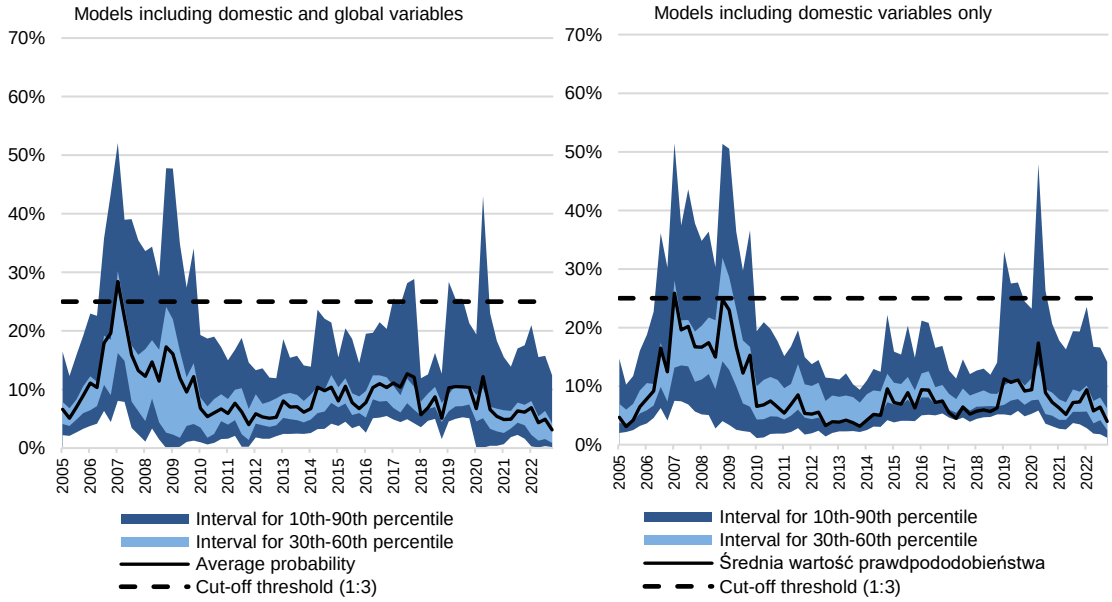
[6] Potential forward-looking indicators have been analysed on data from 47 countries in the years 1970-2016. Individual variables have been analysed, taking into account the levels, dynamics and cyclical

explained is a binary variable denoting banking crises, and the explaining variables are macroeconomic and financial indicators. The advantage of this class of models consists in the possibility of using information coming from many variables and in estimating the likelihood of a crisis on the basis of the variables.

Early warning models including domestic and global (i.e. with the VIX variable) factors as well as early warning models based only on domestic factors (i.e. without the VIX variable) are shown in Figure 6. The models exhibit the highest forecasting quality in the group of around fifty countries in the years 1970–2016.[7]

In 2022 Q4, early warning model rates were at their lowest levels for the period under observation (since early 2005). At present, the risk of a crisis in the medium-term, i.e. from one year to four years, is low. Therefore, **under the current circumstances there is no rationale for creating a CCyB.**

Figure 6. Results of early warning models for Poland



Notes: Last observation for 2022 Q4. The figures show the average (weighted by signal quality) value of probability obtained on the basis of 206 models including domestic and global variables (left panel) and 148 models including only domestic variables (right panel) and the cut-off threshold, which when exceeded, signals the risk of a banking crisis (it has been assumed, following the ESRB studies, that the cost of an absence of a signal warning against a real crisis is three times higher than the cost of a wrong signal about a crisis if no crisis occurs). The blue ribbons denote the range of values of probability (not weighted by signal quality) for all models excluding those models which show the lowest and highest probability of a banking crisis in Poland in every period. The average value of

deviations from the trend. The assessment of the variables had been made over the horizon from 18 quarters to six quarters prior to the crises. The study of Babecký, J., Havránek, T., Matějů, J., Rusnák, M., Šmídková, K., & Vašíček, B. (2013), *Leading indicators of crisis incidence: Evidence from developed countries*, Journal of International Money and Finance, 35, 1-19., which is the result of work under the *ESBC Heads of Research,* has been used for crisis dating purposes.

[7] The best models, with the highest weight in the average shown in Figure 5, correctly classify all pre-crisis and non-pre-crisis situations in over 90% of cases for an international sample. Using the credit gap alone enables accurate classification only in around 65% of cases, and using the best single variable – in around 75% of cases.

probability (a black line) weighted by the quality of signals of the models sometimes runs below the line of the 30th percentile of probabilities and above the line of the 60th percentile of probabilities, because better models have indicated a lower probability and a higher probability of a crisis in these periods, respectively.
Source: Own calculations based on NBP, BIS, Eurostat and OECD data.

Table 1. Summary of key indicators monitored for the purposes of making decisions on the level of the CCyB

Indicator	2022 Q4	2023 Q1
Credit to private non-financial sector to GDP (broad credit aggregate)	70.7%	66.9%
Credit to private non-financial sector to GDP (narrow credit aggregate)	42.5%	39.6%
Standardized credit gap (broad credit measure)	-16.6%	-19.6%
Standardized credit gap (narrow credit measure)	-12.7%	-14.7%
Credit gap taking into account the characteristics of the financial cycle in Poland (broad credit measure)	-2.7%	-4.7%
Credit gap taking into account the characteristics of the financial cycle in Poland (narrow credit measure)	-2.2%	-3.4%
Dwelling prices to income (index; average for 2010 = 100)	81.6	79.6
Hedonic housing price index* (2006 Q3 = 100)	238.9	240.3
Current account balance as % of GDP	-3.7%	-1.6%
Debt Service Ratio	7.0%	6.9%
Contribution of the financial sector to GDP	4.9%	5.1%
Growth of a real broad credit measure (y/y)	-8.9%	-12.8%
Growth of a real narrow credit measure (y/y)	-10.0%	-14.7%
VIX (Volatility Index) – a measure of the implied volatility of options for the S&P 500 index	24.8	25.0

Notes: *Hedonic housing price index (harmonized) – price index per sq metre of a secondary market apartment with 2006 Q3 basis = 100 for 7 cities (including Warsaw). It reflects a change in prices purged of qualitative changes (e.g. an increase/decrease in the share of higher quality (more expensive) apartments).
Source: Own calculations based on data from NBP, BIS, Statistics Poland, Eurostat and Thomson Reuters.