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BANKS BELONGING TO THE ERSTE GROUP AND THEIR SENSITIVITY TO THE CONFIDENCE CRISIS ON THE INTERBANK MARKET

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Abstract

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The aim of this paper is to measure the sensitivity of commercial banks from the Erste Group to the confidence crisis on the interbank market and to compare their sensitivity with average sensitivity of banks in particular countries. We have used the methodology of scenario analysis for the liquid asset ratio. All banks belonging to the Erste Group should be able to withstand the confidence crisis on the interbank market. The group of the most vulnerable banks consists from Erste bank Hungary and Banca Comerciala Romana from Romania. In some cases, banks from the Erste Group are more sensitive; while in other cases are banks belonging to the Erste Group less vulnerable than corresponding banking sectors. Except of banks from Hungary, Romania and Slovakia, subsidiary banks are less sensitive to the confidence crisis than the parent bank. Banks (and banking sectors) who are net borrowers on the interbank market are much more sensitive to the confidence crisis on this market.

Keywords: liquidity risk, liquid asset ratio, scenario analysis, confidence crisis, interbank market, Erste Group, financial conglomerate

INTRODUCTION

The emergence of financial conglomerates is one of the major trends in the financial sector in recent years. There are many motives for conglomeration; however, it should not be omitted that financial conglomerates are very often linked also with higher risks. As liquidity problems of some banks during global financial crisis re-emphasized, liquidity is very important for functioning of financial markets and the banking sector. From the variety of risks of banking business, we will therefore focus on liquidity risk. The insufficient liquidity of a bank may be sometimes caused or deepened by confidence crisis on the interbank market. Even if such situation may be perceived as exceptional, extreme or simply unexpected, it is still a plausible event, therefore in accordance with the recommendation of the Basle Committee for Banking Supervision financial institutions should gauge their potential vulnerability to such events by conducting of stress tests (BIS, 2000).

We will therefore use the methodology of sensitivity analysis which will enable us to address this issue. Erste Group belongs to the largest financial conglomerates in the Central and Eastern Europe. The aim of this paper is to measure the sensitivity of commercial banks from the Erste Group to the confidence crisis on the interbank market and to compare their sensitivity with average sensitivity of banks in particular countries.

The paper is structured as follows. Next section gives theoretical background of bank liquidity and interbank markets. Then we focus on methodology, data and results of scenario analysis. Last section captures concluding remarks.

Theoretical Background

Liquidity risk can be defined as the risk that a bank, though solvent, either does not have enough financial resources to allow it to meet its obligation as they fall due, or can obtain such funds only at excessive costs (Vento and La Ganga, 2009).

The bank is able to satisfy the demand for money, and hence is liquid, as long as at each point in time outflows of money are smaller or equal to inflows plus the stock of money held by bank. If outflows are larger than inflows and the stock of money, there is a deficit. The bank has to find a way how to finance it. Depending on the nature, severity and duration of the liquidity shock, BIS (2008) recommends banks to identify following alternative sources of funding: deposit growth, the lengthening of maturities of liabilities, new issues of short- and long-term debt instruments, intra-group fund transfers, new capital issues, the sale of subsidiaries or lines of business, asset securitization, the sale of highly liquid assets, drawing-down committed facilities and borrowing from the central bank's marginal lending facilities. Not all of these options may be available in all circumstances and some may be available only with a substantial time delay. However, if the bank is unable to finance the liquidity shortage, the bank will become illiquid and default.

The linkages between banks on the interbank market can destabilize the financial system in periods of higher liquidity risk. At the beginning, there is a liquidity shock: as a result of imperfect market information such as poor solvency of any bank, the liquidity of such bank is threatened. This is the type of idiosyncratic liquidity risk which may not significantly harm the banking sector. The problem arises when the risk is transferred to several financial institutions and becomes a systemic liquidity risk. This can occur through the information channel, the real channel or liquidity hoarding (more about these channels e.g. in Komárková *et al*., 2012; Geršl and Komárková, 2009; Kapadia *et al*., 2012 or Acharya and Merrouche, 2013).

As it is evident that bank liquidity is very important and a key characteristic of the global financial crisis was the inaccurate and ineffective liquidity risk management, it is logical that regulatory and supervisory bodies focus more on liquidity risk regulation (see e.g. Teplý and Vrábel, 2011; or Zimková, 2010).

METHODOLOGY AND DATA

Scenario analysis is one of the possible tools how to assess the vulnerability of banks to the bank run (for other possibilities, see e.g. Teplý *et al*, 2012). Therefore we will describe scenario analysis based on selected liquidity ratio in the first part of this section, and then we will focus on data used.

Liquid Asset Ratio

The liquid asset ratio belongs to the most commonly used liquidity ratios. Equation 1 shows the principle of its calculation:

$$LIA = \frac{liquid\ assets}{total\ assets} \times 100(\%). \quad (1)$$

The liquid asset ratio (LIA), i.e. the share of liquid assets in total assets, should give us information about the general liquidity shock absorption capacity of a bank. It shows which part of the total assets can be readily converted to cash. The higher the value of this ratio, the higher is the capacity to absorb liquidity shock. As we use the BankScope measure of liquid assets, the term "liquid assets" includes cash, government bonds, short-term claims on other banks (including certificates of deposit), and where appropriate the trading portfolio. BankScope harmonizes data from different jurisdictions to arrive at a globally comparable indicator. This is particularly advantageous in this case when we compare banks from different countries.

Scenario Analysis Based on Liquid Asset Ratio

Stress testing plays a complementary role in risk management practices of banks. Liquidity stress test should identify and quantify the potential lack of liquidity for specific stress scenario and determine the way how to close this lack at predefined costs. Three types of stress scenarios are usually applied: idiosyncratic, market, and combination of both (Komárková *et al*., 2012).

Several central banks and other supervisory authorities have applied stress tests of liquidity, e.g. in in the Czech Republic (Komárková *et al*., 2011) or in Romania (Negrila, 2010). However, their tests are not possible to repeat with publicly available information. Therefore we will focus also on other less complex studies, such as Boss *et al*. (2004) and Boss *et al*. (2007). These studies focused also on the crisis confidence on the interbank market. Komárková *et al*. (2011) modelled a liquidity dries up in the money market, as 50% of interbank claims are unavailable. Negrila (2010) tested how Romanian banks would react on the sudden drawing of 30% from interbank deposits. The impact of crisis confidence on Austrian banks was measured by Boss *et al*. (2004), which simulated a withdrawal of 20% of interbank deposits, and by Boss *et al*. (2007), by simulation of withdrawal of 40% of all interbank short-term funding.

Based on these studies, we will model a confidence crisis on the interbank market by withdrawal of 20% of interbank deposits. This means both the decrease of dues from banks and dues to banks. To measure the impact of the crisis confidence on bank liquidity, we will calculate stress values of the liquidity ratios for each bank in the sample. Although the decrease of dues from banks would not result to any change of the volume of liquid assets, the decrease of dues to banks has to be financed because these debts must be repaid. So while calculating the stress value of liquid asset ratio, we have to deduct 20% of dues to banks from liquid assets and from total assets (Equation 2):

$$LIA_S = \frac{liquid\ assets - 0.2 \times dues\ to\ banks}{total\ assets - 0.2 \times dues\ to\ banks} \times 100(\%). \quad (2)$$

We suppose that each sound bank should reach the minimum value of the LIA_S of at least 5%. This threshold is based on the study of Komárková *et al.* (2011) who indicated as vulnerable the group of building societies whose level of liquid assets after the application of the stress scenario ranged just about 5%:

$$\Delta LIA = \frac{LIA_S - LIA_B}{LIA_B} \times 100(\%). \quad (3)$$

As a next step, we will compare this stress value of the liquid asset ratio (LIA_S) to the baseline value of this ratio (LIA_B, i.e. LIA). The percentage change will be calculated according to the Equation 3. The results will show the magnitude of the relative changes between the stress and baseline values.

Data Used

Erste Group is one of the largest financial services providers in Central and Easter Europe. About 46,000 employees serve clients in 2,800 branches. Measured by the sum of total assets, the parent company is the biggest bank in Austria and the 81. biggest bank in the world (Tab. I).

Erste Group Bank is a universal bank which provides products of retail and commercial banking, investment and private banking and asset management. Although globally banks from the Erste Group cannot be seen as very large banks (as we can see from its worldwide rank), these banks belong mostly to leading banking institutions in the region of CEE countries. We used unconsolidated balance sheet data, mostly over the period from 2004 to 2013 (with the only exception of Banca Comerciale Romana Chisinau due to lack of data), which were obtained from the BankScope database.

RESULTS AND DISCUSSION

Baseline Values of Liquid Asset Ratio

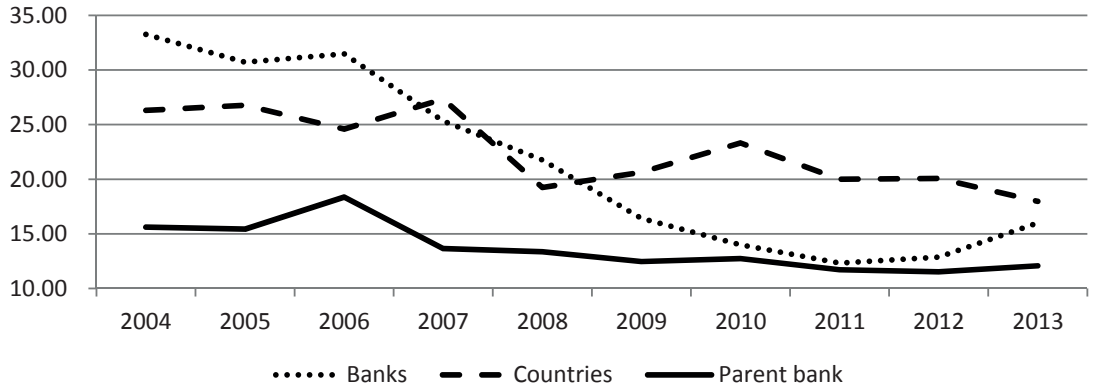
The baseline values of liquid asset ratio (Equation 1) for all banks and all countries (average values for individual banking sectors) are presented in Tab. III. Fig. 1 shows the value of the liquid asset ratio for parent bank. Median values of liquid asset ratio for individual banks from the Erste Group and median values for corresponding countries (banking sectors) are included for comparison.

As higher values of the liquid asset ratio means higher liquidity, it is evident that liquidity of parent bank is lower than liquidity of its subsidiary banks. However, this gap was quite small in 2010 and 2011. Focusing on individual banks from the group (see Tab. III), there are some exceptions in some years. Liquidity position of following banks

I: *Information about banks in the sample*

Bank	Country	Bank size (country/world)	Period
Erste Group Bank (parent comp.)	Austria	1./81.	2004–2013
Erste & Steiermärkische Bank	Croatia	2./1260.	2004–2013
Česká spořitelna	Czech Republic	3./453.	2004–2013
Erste Bank Hungary	Hungary	2./1170.	2004–2013
Banca Comerciale Rom. Chisinau	Moldova	12./12504.	2006–2013
Erste Bank Podgorica	Montenegro	2./-	2004–2013
Banca Comerciala Romana	Romania	1./808.	2004–2013
Erste Bank Novi Sad	Serbia	12./4879.	2004–2013
Slovenská sporiteľňa	Slovakia	1./1026.	2004–2013

Source: author's processing



1: *Baseline values of liquid asset ratio (in %)*
Source: author's calculations

is worse than the position of the parent bank: Erste & Steiermärkische Bank (in 2010–2013), Erste Bank Hungary (in 2004, 2006–2008), Erste Bank Podgorica (in 2004, 2009–2011), Banca Comerciala Romana (in 2011–2013), Erste Bank Novi Sad (in 2010 and 2012) and Slovenská sporiteľňa (in 2011–2013).

If we compare the values of liquid asset ratio of subsidiary banks with average values in corresponding banking sector, we get slightly different results. In the first part of the analyzed period, liquidity of banks belonging to the Erste Group was above the average of the banking sector. The exceptions were Česká spořitelna and Erste Bank Podgorica. However, in the second part of the analyzed period, liquidity of banks from the Erste Group is below average of the corresponding countries, with the exception of Erste Bank Podgorica from Montenegro.

The decreasing liquidity of most banks in the sample, together with the fact that their liquidity is mostly lower than in corresponding banking sectors since 2008, may suggest that maybe we should take into account also the possibility of intra-group support. The probability that at least some subsidiary banks could provide some liquidity support to the parent company can be also confirmed by the survey of Bank for International Settlements. According to findings of this survey (BIS, 2012), financial groups which encountered problems between 2007 and 2009 during the financial crisis typically had to consider the question of intra-group support. Intra-group liquidity support consists of various types of support measures, such as a) a credit or a credit line provided by one entity to another entity within the group; b) intra-group cross shareholdings; c) trading operations whereby one group entity deals with or on behalf of another group entity; d) central management of short-term liquidity within the group and g) guarantees and commitments provided to or received from other companies in the group. Support measures may exist in the form of upstream support (support provided by a subsidiary to its parent) or downstream support (support provided by a parent to its subsidiary). Both types of support typically increase the risk of loss to the provider and adversely affect its solvency, liquidity and profitability. Values of liquid asset ratio of parent bank and its subsidiaries indicate the higher probability of upstream support.

As values of liquid asset ratio are quite low in some cases, it is useful to measure the vulnerability of banks to possible confidence crisis on the interbank market with the use of scenario analysis.

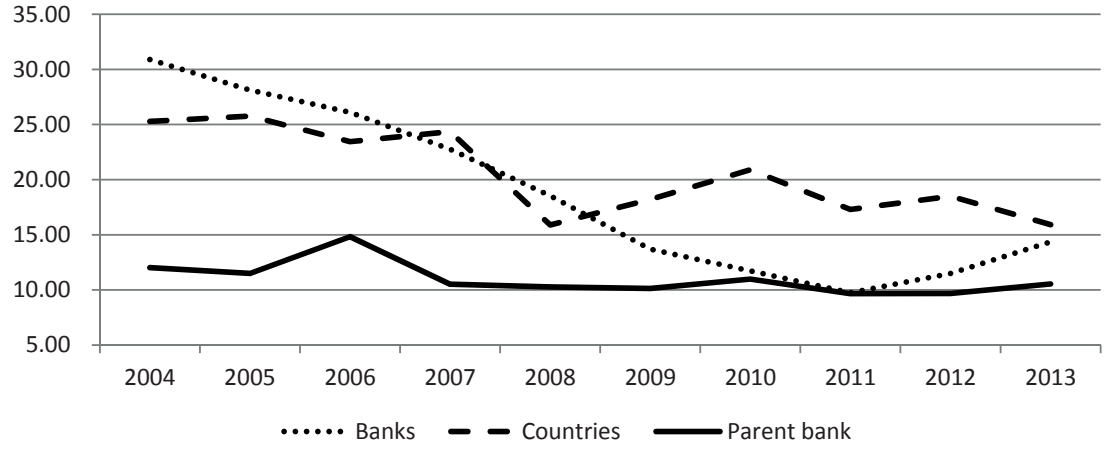
Stress Values of Liquid Asset Ratio

We have calculated stress value of the liquid asset ratio for parent bank, subsidiaries and corresponding banking sectors. Detailed values are provided in Tab. IV, value for parent bank and median values for subsidiaries and banking sectors (countries) are presented in Fig. 2.

Although the values are lower, the development trend is logically the same as in case of baseline values. Liquidity of parent bank after the withdrawal of 20% of interbank deposits is lower than liquidity of its subsidiary banks. In spite of a decrease in liquidity, all banks belonging to the Erste Group should be able to finance such interbank deposit withdrawals. This is proved by positive value of the stress liquid asset ratio for the whole period. However, liquidity position of some banks would be very poor; LIA_S for Erste Bank Hungary (in 2006–2008, 2010), Banca Comerciala Romana (in 2011–2012) and Slovenská sporiteľňa (in 2012–2013) is lower than 5% (Tab. IV).

Severity of the Stress Scenario

It is useful to calculate also the percentage decreases of the liquid asset ratio caused by the scenario "Confidence crisis". Results of Equation 3 are presented in Tab. II (median values for banks and individual countries) and in Tab. V (more



2: *Stress values of liquid asset ratio (in %)*
Source: author's calculations

II: *Severity of the scenario "Confidence crisis" (in %)*

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Banks	–4	–8	–9	–8	–8	–14	–3	–7	–19	–12
Countries	–5	–4	–5	–6	–12	–10	–11	–13	–13	–13
Parent	–23	–25	–19	–23	–23	–19	–14	–17	–16	–13

Source: author's calculations

detailed results). The decrease of LIA can inform us: i) which bank (and which banking sector) is the most vulnerable; ii) if banks from the Erste Group are more or less sensitive to confidence crisis on the interbank market than it is typical for corresponding banking sectors, and iii) if the parent bank is more or less sensitive to this scenario than subsidiary banks.

With the only exception of 2012, banks belonging to the Erste Group are as a whole less sensitive to the possible confidence crisis on the interbank market. Focusing on more detailed results in Tab. V, the dispersions of the values of ΔLIA is quite significant as it ranges from 0 to 88% for individual banks and from 1 to 48% for corresponding banking sectors. Answers to three defined research questions are presented in following text.

In order to find out which bank (and which banking sector) is the most vulnerable to the confidence crisis on the interbank market, we will look at the values of ΔLIA and we will find the highest value for particular years. When it comes to the most vulnerable banking sectors, it was the Hungarian in the period 2004–2009, the Romanian in 2010–2012 and the Slovak banking sector in 2013. If we want to identify the most vulnerable banks, results are not surprising, as it mostly corresponds with the most vulnerable banking sectors. Erste bank Hungary is the most sensitive bank in years 2004–2010 and Banca Comerciala Romana had the largest decline of LIA in years 2011–2013. Mentioned banks and banking sectors were in those years in the position of net borrower on the interbank market. Banks (and banking sectors) who are net borrowers are much more vulnerable: funds from interbank market are less stable than for example clients' deposits because banks are constantly under the control of their counterparties which in case of doubts about the financial situation of the bank may not roll over loans.

Are banks from the Erste Group more or less sensitive to the confidence crisis on the interbank market than it is typical for corresponding banking sectors? It is not possible answer this question generally. In some banking sectors, banks from the Erste Group are more sensitive than the corresponding banking sectors, such as in Hungary, Romania, Croatia or Moldova. On the contrary, banks from Montenegro, Serbia, Slovakia or Czech Republic are less vulnerable than corresponding banking sectors.

Is the parent bank more or less sensitive to the confidence crisis on the interbank market than subsidiary banks? Except of banks from Hungary, Romania and Slovakia (especially for the second half of the analyzed period), subsidiary banks are

III: *Baseline values of liquid asset ratio*

Banks	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Parent bank	16	15	18	14	13	12	13	12	12	12
Erste & Steiermärk.B.	47	35	31	30	32	15	12	7	11	12
Croatia	38	33	32	33	32	30	31	23	25	17
Česká spořitelna	22	26	23	14	20	22	25	16	15	18
Czech Republic	25	30	25	21	18	17	17	17	18	24
Erste Bank Hungary	15	18	12	12	12	18	14	21	20	20
Hungary	15	15	14	13	10	10	9	11	11	12
B.Comerc. R. Chis.			32	18	15	40	26	17	16	15
Moldova	40	38	33	38	41	45	33	39	42	47
Erste Bank Podgor,	15	35	50	38	17	11	10	5	16	21
Montenegro	40	54	49	32	18	24	29	23	22	20
B. Comerc. Romana	49	34	39	33	23	18	17	9	8	10
Romania	27	23	24	23	17	16	12	11	10	14
Erste B. Novi Sad	34	31	52	44	24	15	7	15	10	17
Serbia	18	19	24	61	49	50	39	42	39	19
Slovenská sporiteľ.	33	31	28	21	26	13	14	8	6	3
Slovakia	16	15	19	16	20	13	11	9	10	6

Source: author's calculations

IV: *Stress values of liquid asset ratio*

Banks	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Parent bank	12	11	15	11	10	10	11	10	10	11
Erste & Steiermärk.B.	46	30	25	26	31	15	12	7	5	7
Croatia	37	32	31	32	29	27	28	20	22	15
Česká spořitelna	21	25	22	13	19	21	24	15	14	16
Czech Republic	24	30	24	19	16	15	15	14	15	20
Erste Bank Hungary	10	11	4	4	1	9	4	12	13	15
Hungary	13	12	11	10	5	6	6	7	8	9
B.Comerc. R. Chis.			27	17	13	29	26	15	15	14
Moldova	40	38	32	38	40	44	32	38	41	45
Erste Bank Podgor,	15	34	50	38	17	11	10	5	16	21
Montenegro	37	52	46	28	16	22	27	22	22	20
B. Comerc. Romana	47	32	36	28	18	13	11	4	2	5
Romania	26	22	22	21	14	11	7	6	6	12
Erste B. Novi Sad	31	28	50	43	24	15	7	15	10	17
Serbia	16	17	23	59	47	47	36	39	36	16
Slovenská sporiteľ.	31	28	26	19	23	10	12	6	4	3
Slovakia	15	13	17	15	15	12	9	8	7	5

Source: author's calculations

V: *Severity of the scenario "Confidence crisis" (decrease of liquid asset ratio in %)*

Banks	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Parent bank	–23	–25	–19	–23	–23	–19	–14	–17	–16	–13
Erste & Steiermärk.B.	–2	–15	–17	–13	–3	–3	–3	–3	–53	–45
Croatia	–2	–3	–4	–3	–8	–11	–9	–13	–12	–12
Česká spořitelna	–4	–3	–4	–9	–5	–4	–4	–6	–6	–9
Czech Republic	–4	–3	–3	–5	–13	–15	–15	–15	–15	–18
Erste Bank Hungary	–33	–37	–65	–68	–88	–50	–69	–42	–35	–28
Hungary	–18	–20	–21	–27	–46	–39	–40	–33	–27	–22
B.Comerc. R. Chis.			–18	–6	–13	–27	–1	–7	–4	–4
Moldova	–1	–1	–1	–2	–4	–3	–3	–3	–2	–3
Erste Bank Podgor,	–4	–1	0	0	0	–1	0	0	0	0
Montenegro	–5	–3	–5	–11	–12	–10	–8	–7	–2	0
B. Comerc. Romana	–3	–7	–9	–15	–23	–30	–31	–62	–74	–48
Romania	–3	–5	–7	–11	–18	–34	–41	–48	–45	–15
Erste B. Novi Sad	–9	–9	–3	–1	0	0	0	0	0	0
Serbia	–9	–10	–6	–5	–6	–5	–7	–7	–7	–11
Slovenská sporiteľ.	–6	–8	–8	–6	–11	–24	–13	–29	–32	–16
Slovakia	–8	–10	–7	–8	–25	–10	–13	–14	–26	–29

Source: author's calculations

less sensitive to the confidence crisis than the parent bank. As it was mentioned above, the vulnerability of the bank is determined mainly by the net interbank position of the bank, and the Erste Group is in the position of net borrower for the whole period.

CONCLUSION

The aim of this paper was to measure the sensitivity of commercial banks from the Erste Group to the confidence crisis on the interbank market and to compare their sensitivity with average sensitivity of banks in particular countries.

We have used the methodology of scenario analysis for the liquid asset ratio. The results of the baseline values of the liquid asset ratio showed that the liquidity position of majority of banks belonging to the Erste Group is higher than liquidity of the parent bank. Subsidiaries banks were mostly more liquid than the corresponding banking sectors in the first part of the analyzed period, however, it has changed in 2008. These results may suggest that probably there were any types of upstream intra-group support measures.

Then we have focused on the stress values of the liquid asset ratio. All banks belonging to the Erste Group should be able to withstand the confidence crisis on the interbank market. Liquidity of parent bank would be lower than liquidity of its subsidiary banks.

Finally, the results of the percentage change of the liquid asset ratio after the application of the stress scenario "crisis confidence on the interbank market" enable us to answer three important questions:

Which bank (and which banking sector) is the most vulnerable to the confidence crisis on the interbank market? When it comes to the most vulnerable banking sectors, it was the Hungarian in the period 2004–2009, the Romanian in 2010–2012 and the Slovak banking sector in 2013. The group of the most vulnerable banks consists from two banks: Erste bank Hungary (in 2004–2010) and Banca Comerciala Romana from Romania (in 2011–2013). Banks (and banking sectors) who are net borrowers on the interbank market are much more sensitive to the confidence crisis on this market.

Are banks from the Erste Group more or less sensitive to the confidence crisis on the interbank market than it is typical for corresponding banking sectors? In some cases, banks from the Erste Group are more sensitive; while in other cases are banks belonging to the Erste group less vulnerable than corresponding banking sectors.

Is the parent bank more or less sensitive to the confidence crisis on the interbank market than subsidiary banks? Except of banks from Hungary, Romania and Slovakia, subsidiary banks are less sensitive to the confidence crisis than the parent bank.

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