The Banking Sector in New EU Member Countries:
A Sectoral Financial Flows Analysis[*]

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Abstract

We analyze financial-system development in the so-called Visegrad Four countries (Hungary, the Czech Republic, Poland, and Slovakia) during 1993–2005. We conceptualize the Visegrad Group economy as a set of sectors that interchange financial assets to measure financial-system development. In particular, we analyze financial flows between the commercial banking sector and other sectors of the economy. We show that households and non-financial companies are the largest creditors. In terms of debits, non-financial companies are the largest borrowers. Further, we provide indirect evidence that the completed privatization of the Visegrad banking sector is an important factor behind the dramatic change in the degree of credit and debit flows. The majority of the data series in all four countries exhibit structural breaks in mean in the year in which the privatization of the banking sector was completed. The importance of the individual channels of financial flows is assessed using intermediation ratios. We show that the role of banks as mobilizers of savings from the non-financial sectors is substantial and that banking is not a declining industry in the Visegrad Four countries.

1. Introduction and Motivation

The development of the banking sector during the transformation from plan to market is one of the most researched topics in the economics of transition. Much of the research analyzes institutional settings, bank privatizations or banking performance and efficiency. This paper is differentiated from the mainstream literature by analyzing financial flows between commercial banks and other sectors in the economy over the course of the transformation process in the Czech Republic, Hungary, Poland, and Slovakia (the Visegrad Four group) while employing disaggregated data.[1] Our aims are to investigate the financial flows across different sectors in the economy and to ascertain their implications for transition economies, to establish an econo-

metric relationship between financial flows and privatization, and to assess the (dis)-intermediation of the banking sector. In our analysis we identify the largest sectoral creditors and debtors and connect completed privatization with a dramatic change in the extent of credit and debit flows. Further, we conclude that the role of banks as mobilizers of savings from the non-financial sectors is not declining and that banking is not a declining industry in the Visegrad Four countries.

Financial institutions including banks rarely materialize in standard neoclassical theory and until relatively recently the role of banks in an economy was not considered in general equilibrium-based models. The theoretical work of Stiglitz (1985, 1994) related to the economics of information and incentives laid down the foundations to seriously consider financial institutions, financial structure, and the general design of financial systems as directly affecting the workings of the economy. Earlier, Gurley and Shaw (1955, 1960) developed a theory of financial intermediation that recognized that banks transform the quality of capital with respect to amounts, maturities, and risks. By transforming capital, banks productively increase the capital's social value by putting it to more efficient use. More explicit analysis of banks as financial intermediaries has been pursued within the scope of the well-established theory of financial intermediation based on the work of Townsend (1979), Diamond and Dybvig (1983), Diamond (1984), Allen (1990), Calomiris and Kahn (1991), and Bhattacharya and Thakor (1993). These authors focus on the banks' existence because of their specific superior abilities as compared to financial markets and non--banking financial institutions.[2]

With the development of the above-mentioned theories and based on the economics of information and incentives, a great deal of attention has been devoted to the study of the role of financial institutions and the design of financial systems. The rapid development of capital markets, the emergence of non-banking financial intermediaries, and the growth of the securitization business along with the globalization of international financial markets all manifest ongoing fundamental changes in the design of financial systems. An extensive literature studies the links among the functioning of the financial system, the effectiveness of the monetary policy, and the economic growth in standard market economies – e.g., (King, Levine, 1993a,b), (Levine, Zervos, 1998). Some empirical evidence (e.g., Miller, 1998) seems to suggest a decreasing role of commercial banking (especially as collectors of savings) with non-banking financial institutions taking over. Other studies see banks' importance preserved thanks to the increasing share of off-balance sheet activities (Boyd, Gertler, 1993, 1994, 1995), international lending (McCauley, Seth, 1992), or "unique

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[1] We focus on the Visegrad Four countries since they share important economic and institutional features. As early as December 1991, Czechoslovakia, Poland and Hungary signed the European Agreement with the European Union. These countries have striven to establish a workable framework for international trade and cooperation in order to facilitate the transition process. Their effort was institutionalized in March 1993 in the form of the Central European Free Trade Agreement (CEFTA). On a broader scale, these four countries established a framework for political cooperation by signing the Visegrad agreement. In 1995 or 1996, each country applied for EU membership and all of them became members in 2004.

[2] Financial intermediaries are superior in reducing transaction costs. Additionally, they provide brokerage and qualitative asset transformation services, the cost of which are reduced by an increase in the size of the provider. Bank loans can signal the quality of the firm in the economy where informational asymmetries between borrowers exist and this feature is unique to bank loans when compared to other forms of debt financing. Lastly, banks enhance and improve the quality of aggregate investment.

features" of banks as they are well equipped for assessing and monitoring complex cases – e.g., (James, 1987), (Bhattacharya, Thakor, 1993).

The above-mentioned literature deals with the development of the banking industry and financial sector in developed market economies but the topic is still under-researched in the context of emerging markets. A special category within emerging markets is comprised of economies that in the early 1990s embarked on an uneasy path of transformation from a command to a market economic system. For them, the structure and health of the financial system turned out to play a fundamental role in the progress of transformation. In Western Europe the research focus has been on whether the traditionally "bank-dominated" financial systems of continental Europe (especially Germany) are losing ground in favor of the "market-dominated" systems established in countries like the United Kingdom or the United States. In the emerging European markets, both banking and capital market sectors had to develop from scratch. While the capital markets did not exist at all under central planning, banks merely played the role of savings collectors and income redistribution vehicles for the central governments, serving none of the important roles they assume in the market economy.

The direction and speed of the development of the financial system during transition has depended on a number of factors that are well documented in the literature – the macroeconomic situation (Reininger, Schardax, Summer, 2002), the chosen course of privatization (Bonin, Hasan, Wachtel, 2005b), the legal environment (Pistor, Raiser, Gelfer, 2000), and the openness of the economy to foreign investors (Cottarelli, Dell'Ariccia, Vladkova-Hollar, 2005), to name just some of the most important ones. Unlike in developed economies, where the speed of changes in the financial system structure may be inhibited by traditional long-term relationships between firms and commercial banks, the development of the financial system in a transforming economy is to a much larger extent directly affected by the changes specified in the research.[3] Differences among transforming countries may also affect the variation in the actual speed and course of the development of the financial system.[4]

There exists an important literature that analyzes the performance of banks after privatization in transforming European economies. The studies of Bonin, Hasan and Wachtel (2005a,b), Fries, Neven, Seabright, and Taci (2006), and Fries and Taci (2005) provide evidence that the performance of banks improves after their privatization to real owners, chiefly through foreign direct investment. Conversely, to the best of our knowledge there does not exist any study that would describe the unique patterns of financial sector development by analyzing the developments of the banking sector from the perspective of how financial flows between banks and other sectors of the economy develops during the transformation period. In this respect our study is not a typical micro-oriented analysis, and neither is it a macroeconomic study analyzing solely aggregate outcomes of the banking industry within an economy as a whole. As a preliminary task we elaborate on financial flows, the collection of the dataset

[3] Further, corporate financial distress as well as financial crises in the Central European emerging markets may affect banks' behavior to a larger extent than in established market economies –see (Dahiya, Saunders, Srinivasan, 2003) for analysis of financial distress and bank lending relationships.

[4] The institutional setting that impacts the development of the banking sector in transition economies is discussed, for example, by Harper (2002), Hermes and Lensink (2000), and Wachtel (2006).

FIGURE 1 Asset Share of State-Owned Banks
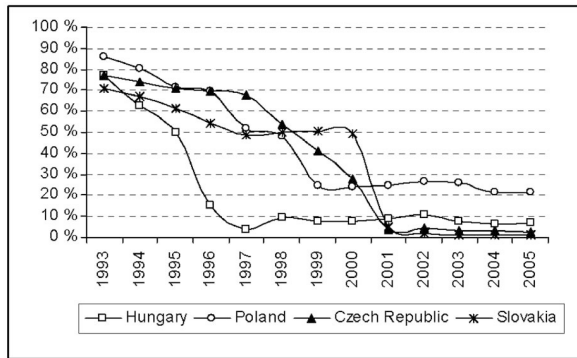
and the calculation of descriptive statistics regarding financial flows. This is done in order to lay the foundations for the subsequent tests of the hypotheses.

The rest of the paper is organized as follows: In Section 2 we briefly describe the emergence of the banking sector in the Visegrad Four countries. In Section 3 we introduce our methodology and data. In Section 4 we present our empirical results, and Section 5 briefly concludes the paper.

2. The Emergence of the Banking Sector

The commercial banking sector emerged in the Visegrad Four countries as a result of the breakup of the state bank (monobank) system combined with issuing licenses to new banks. The overall development of bank privatization in the Visegrad Four countries is summarized in *Figure 1*, which shows the proportion of state control in the banks measured as the asset share of the banks owned by the state. All four countries exhibit a similar level of state ownership in their banking sector in the early 1990s. Hungary produced the fastest emergence of truly private banks as it managed to reduce state ownership from 75 % in 1993 to about 10 % in 1997. State control remains slightly below 10 % to the present day. For a review and assessment of the privatization of the Hungarian banking sector, see (Abel, Siklos, 2004). Poland and Slovakia conducted their banking privatization at a slower pace than Hungary and on top of this the countries stagnated for a non-negligible time. Slovakia halted bank privatization during 1997–2000 but eventually continued at a rapid pace to complete bank privatization by 2001. Poland slowed down in 1999 and has stagnated with about 25 % of state ownership in banks since that time. For a detailed analysis of Polish banking sector development see (Miani, Sagan, 2006). The Czech Republic seems to be working at the steadiest pace and managed to achieve full banking privatization by 2001. For further details, see (Nollen, Kudrna, Pazderník, 2005).

On the micro level the privatization developments in each country differed considerably. In general the banking sector transformation was a lengthy process for two main reasons. One, unlike firms that were part of the command economies, commercial banks emerged as a new segment of the two-tier system after the monobank system was abolished. Two, many governments have proceeded with bank privatization at a slow pace to prolong control over firms through credit channels provided

by state-owned banks.[5] For a comprehensive overview of the development of the banking sector in these four (and other transition) countries, see (Barisitz, 2005).

The emergence of the banking sector in the Visegrad Four countries is interlinked with the emergence of ownership structures during transition. The developments of financial flow patterns that we describe in the empirical section as well as the results of the testing of the hypotheses should be viewed from the perspective of evolved ownership structures following privatization. At the beginning of transition the financial sector was weak, banks were often undercapitalized, and usually only after the controlling stakes were sold to investors via foreign direct investment did the situation improve. This is supported by Bonin, Hasan and Wachtel (2005a,b) who studied bank privatization in six relatively advanced transition countries (including the Czech Republic, Hungary and Poland), and found that foreign-owned banks are more cost-efficient than other banks and that they also provide better service, particularly if they have a strategic foreign owner. The works of Fries, Neven, Seabright, and Taci (2006), Fries and Taci (2005), and Weill (2003) document the development of the ownership structure in the banking industry towards large foreign acquisitions and in terms of bank performance they conclude that performance is improved under foreign ownership.[6]

3. Methodology and Data

We take the theory of financial intermediation referenced earlier as a theoretical background for our empirical work. We build on the methodology in Schmidt, Hackethal and Tyrell (1999) that utilizes the concept of an economy as a set of sectors that interchange financial assets. In the analysis they consider a matrix of financial claims and financial sources. In such a matrix cells in rows indicate financial claims and cells in columns indicate sources. In our applications we deviate from their approach to better accommodate our goals since we are primarily interested in inter-sectoral claims and not in claims and liabilities within a sector (diagonal cells). Moreover, since we are interested in the interactions of the banking sector with other sectors, especially with companies, households and the central bank, we will construct matrices of financial claims and sources that refer specifically to the banking sector. More details are given presently in this section.

To assess the developments and changes in the inter-sectoral financial flows we introduce several ratios and indices for measuring the flows of financial assets among various sectors. The importance of each financial channel can be assessed using intermediation ratios that indicate what portion of total financial assets (liabilities) of a given sector is channeled to (from) other sectors. In general, an intermediation ratio or a share of financial flows between sector i and j at time t ($SFA_{i,j}$) can be formally defined as the ratio of financial flows between sectors i and j ($FA_{i,j}$) to the total of financial flows between sector i and the rest of the economy:

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[5] In this way governments continued to uphold a soft-budget constraint to varying extents during the transformation.

[6] From the microstructure perspective, Hanousek, Kočenda and Svejnar (2007) find that Czech banks tend to improve the corporate performance (profit/sales and ROA) of the firms in which they are the single largest owner.

$$SFA_{i,j}(t) = \frac{FA_{i,j}(t)}{\sum_k FA_{i,k}(t)} \qquad (1)$$

In our analysis we concentrate on the interactions of the banking sector with the economy. We consider an economy consisting of the following sectors: the banking sector, the central bank, non-banking financial institutions, the public sector, non--financial companies, households, and the rest of the world. Such a division is driven by two main reasons. First, the defined sectors reflect the standard concept of the main economic players in the economy as well as their representation in many macroeconomic models. Second, during the transformation period in the Central and Eastern European (CEE) countries central banks as regulators paid special attention to banking sector developments, and thus the data on financial flows between banks and the above-defined sectors of an economy are quite reliable.

Therefore, following the general definition in equation (1) we construct the share of the financial flows from sector j to the banking sector at time t ($SB_j(t)$) as

$$SB_j(t) = \frac{FS_j B(t)}{\sum_k FS_k B(t)} \qquad (2)$$

where $FS_j B(t)$ stands for flows from sector j to the banking sector. In this case banks are debtors and sectors are creditors. Similarly, we define the proportion of financial flows from the banking sector to sector j at time t ($BS_j(t)$) as

$$BS_j(t) = \frac{FBS_j(t)}{\sum_k FBS_k(t)} \qquad (3)$$

where $FBS_j(t)$ stands for the flows from banks to sector j. In this case banks are creditors and sectors are debtors.

The above-defined ratios represent the financial proportions of each sector in the economy with respect to commercial banks and thus allow us to trace the contribution of each individual economic sector to the development of the commercial banking system over the time of transformation and economic integration. Let us note that variables $S_j B(t)$ and $BS_j(t)$ are appropriate measures to capture the flows of value-adjusted financial assets between the banking sector and other parts of CEE economies. Intermediation ratios captured by $S_j B(t)$ and $BS_j(t)$ can be used to formulate and test stylized hypotheses about investment and funding patterns of individual sectors of the economy. Further, the intermediation ratios are superior to an indicator of the financial sector assets over total financial assets of the economy, which is frequently employed in the literature to describe the importance of the financial sector in a given country. However, the ratio defined in such a manner may be misleading because it double counts intrasectoral financial claims. For this as well as other reasons it is not well suited to indicate whether and how the role of financial intermediaries differ across countries and over time.

Further, we define the following indices in order to measure specific developments in sectoral credits or debits and to capture how the financial flows in a given

sector have evolved over time since 1993, which is the beginning of our sample and the basis year. The index of the credits flowing from sector j to commercial banks at year t ($IC_j(t)$) is defined as

$$IC_j(t) = \frac{C_j(t)}{C_j(1993)} \frac{CPI(1993)}{CPI(t)} \tag{4}$$

where C_j stands for credit flows from sector j to banks and CPI is the consumer price index used to adjust for the effect of inflation. In a similar fashion we define the index of the debits that sector j draws from commercial banks at year t ($ID_j(t)$) as

$$ID_j(t) = \frac{D_j(t)}{D_j(1993)} \frac{CPI(1993)}{CPI(t)} \tag{5}$$

where D_j stands for debit flows drawn by sector j from banks. The construction of both indices ensures their unidimensionality or unit independence.

The proportions and indices of the financial flows between sectors are computed from the yearly data covering 1993 to 2005. The data on the Visegrad Four countries come from the Central Statistical Office of Poland, the Czech National Bank, the Czech Statistical Office, the National Bank of Hungary, the National Bank of Poland and the National Bank of Slovakia. They cover the following sectors of the economy: the banking sector, the central bank, non-banking financial institutions, the public sector, non-financial companies, households, and the rest of the world.

The scope of our data as well as our methodological approach can be best illustrated with the help of *Tables 1–4* in the empirical section. First, we compute the ratio of each economic sector's cash flow with respect to commercial banks ($SB_j(t)$ and $BS_j(t)$). Each entry in a given row indicates the proportion of financial claims that the sector in the row heading holds on the banking sector in a specific year indicated in the column heading. The claim can be in the form of credit or debit. The proportions are expressed as ratios of the credits or debits to the total assets of all sectors in a given year, and in this sense they account for changes in the scope of financial flows within the economy. The use of the cash flow as an indicator for the role of commercial banks as a catalyst for the capital market is superior to using the number of commercial banks, which is not quite pertinent to the banking sector's role after privatization.

Second, each row contains an index that illustrates how the financial claims of a given sector evolve over time, including the developments of the total assets for all sectors ($IC_j(t)$ and $ID_j(t)$). The indices are calculated based on the absolute amounts of credits or debits within the economic sectors and are free from the effect of inflation. In this sense the indices provide information about the real extent of financial flows. Further, the indices conveniently illustrate the time-varying financial claims comparable across the four countries since the absolute values of financial flows are collected in four different currencies. By using an index we also avoid the effect of uneven development in the currencies' values (exchange rates).

Third, directly from our data we compute the intermediation ratios that take a sectoral/institutional perspective and indicate what portion of total financial flows of non-financial sectors is channeled to (from) financial intermediaries as opposed to claims on (from) other non-financial sectors.[7] More importantly, these ratios can be

used to formulate and test stylized hypotheses about the current nature of the financial sector in the Visegrad Four countries as well as about investment and funding patterns in the economy. The hypotheses are introduced and tested in the empirical section.

4. Empirical Results

4.1 Financial Flows: Credits and Debits

The empirical results on monetary flows between various sectors and commercial banks are summarized in *Tables 1–4*. For each country we distinguish between credits and debits that are reported in parts A and B of each table, separately for all four countries.

In terms of credits, households are the largest creditors of the commercial banks in the Czech Republic, Hungary, Poland and Slovakia. Non-financial companies are the second largest group. An exception is Hungary, where external sources (the rest of the world) have been increasing their share over time. Hungary conducted chiefly a piecemeal privatization as opposed to the mass schemes in the rest of the Visegrad Four countries. Therefore, a possible explanation for why Hungary differs in this respect from the other three countries is the credit flows from foreign companies that privatized Hungarian firms through FDI and supplied credit to them along with a high level of subordinated debt.

In terms of debits, non-financial companies are the largest borrowers uniformly across the four countries in general. Two exceptions are markedly visible. First, in Poland, external sources have been quite strong over time. Second, in the recent past the central bank became the largest debtor in Slovakia with the peak in 2005. To a lesser extent the central bank became a large debtor in the Czech Republic as well, with the peak in 2002. We conjecture that the extent of financial flows going from banks to the central banks may be associated with the repayments of loans during the post-privatization consolidation of the banking sector as well as an increase of required deposits in absolute terms. More importantly, in the case of Slovakia the above-mentioned increase largely reflects the sterilization of massive capital inflows by reverse repo transactions.[8] Also, a very interesting pattern that can be observed in all four countries is the increasing share of bank lending to households and the decreasing or stagnant share of bank lending to the corporate sector; an analysis of this phenomenon is beyond the scope of this paper.

Several details specific to each country deserve attention. In the Czech Republic, the role of the banking sector is quite balanced in terms of intermediation. When the extent of growth in financial flows is compared (*Table 1*), the index of banking debts gradually rises to a value of 263 while the index of credits reaches 236. The extent of banking intermediation in Hungary (*Table 2*) is about three times larger than in

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[7] This way we are able to measure the importance of these individual channels. For example, Debit-IR of Banks indicates the proportion of funds that banks obtain from other types of intermediaries (NBFI), while Credit-IR of Households measures the fraction of the total financial claims of households that are claims on the two financial sub-sectors.

[8] The volume of funds deposited at the National Bank of Slovakia in the form of reverse repo trades grew on a year-on-year basis from SKK 223 billion to SKK 303 billion in 2005. In an international comparison the share of funds deposited at the National Bank of Slovakia in the total assets in Slovakia greatly exceeds the average for states of the enlarged EU. For more details, see (Jurča, Ličák, Rychtárik, 2005).

TABLE 1a Czech Republic:
Proportions of Credits Flowing from Other Sectors to the Banking Sector (Sectors Are Creditors, Banks Are Debtors)

	Credits		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
														Banking Sector	
1	Households	Share	44,4%	46,0%	49,7%	53,3%	58,0%	64,2%	66,1%	68,0%	64,8%	58,5%	60,4%	61,6%	57,9%
		Index	100	109	121	127	156	156	155	158	168	165	172	178	184
2	Non-financial companies	Share	27,9%	30,6%	30,4%	29,7%	23,5%	20,6%	19,6%	19,7%	20,6%	21,4%	23,1%	23,2%	24,1%
		Index	100	115	117	113	101	80	73	73	85	96	105	107	122
3	Public Sector	Share	10,8%	8,0%	5,8%	5,3%	4,3%	4,3%	4,6%	5,6%	7,0%	12,0%	9,1%	9,2%	9,7%
		Index	100	77	58	52	47	43	44	54	74	138	106	109	127
4	Rest of World	Share	0,2%	0,3%	0,8%	0,9%	3,5%	3,3%	3,4%	3,3%	2,5%	2,5%	2,1%	2,1%	2,7%
		Index	100	144	376	383	1 721	1 487	1 454	1 414	1 191	1 277	1 111	1 110	1 575
5	Central Bank	Share	10,8%	9,5%	8,1%	8,2%	8,1%	4,4%	2,9%	1,5%	0,3%	0,2%	0,0%	0,0%	1,6%
		Index	100	93	81	80	90	44	28	14	3	2	0	0	20
6	Non-bank Fin. Companies	Share	5,9%	5,6%	5,1%	2,6%	2,7%	3,2%	3,5%	1,8%	4,7%	5,5%	5,2%	3,9%	4,1%
		Index	100	99	93	47	54	57	62	31	92	116	111	84	97
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of credits		100	115	129	138	170	169	167	172	200	222	224	234	263

TABLE 1b Czech Republic:
Proportions of Debits of the Banking Sector with Respect to Other Sectors (Sectors Are Debtors, Banks Are Creditors)

Debits		Banking Sector												
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1 Households	Share	13,9%	13,1%	10,6%	10,3%	8,6%	7,9%	8,7%	9,6%	11,2%	12,9%	16,6%	21,7%	26,2%
	Index	100	106	91	85	84	74	76	79	86	109	143	184	239
2 Non-financial companies	Share	81,6%	74,7%	69,0%	73,9%	70,7%	62,6%	60,7%	57,1%	42,6%	31,4%	30,2%	31,9%	33,3%
	Index	100	103	102	104	118	99	90	80	56	45	44	46	52
3 Public Sector	Share	3,6%	3,6%	3,2%	0,5%	1,4%	2,2%	2,6%	4,3%	13,2%	12,4%	11,3%	8,1%	5,3%
	Index	100	113	107	17	53	79	89	139	398	404	380	269	189
4 Rest of World	Share	0,5%	0,3%	0,3%	0,6%	2,1%	5,7%	6,7%	5,9%	3,8%	3,0%	3,1%	2,9%	3,8%
	Index	100	75	74	137	579	1 526	1 668	1 398	828	728	752	694	994
5 Central Bank	Share	0,5%	8,3%	17,0%	14,1%	15,3%	20,0%	21,0%	22,6%	24,7%	35,5%	33,1%	29,8%	25,3%
	Index	100	2 028	4 425	3 516	4 515	5 615	5 510	5 618	5 740	8 984	8 602	7 625	6 978
6 Non-bank Fin. Companies	Share	0,0%	0,0%	0,0%	0,5%	1,9%	1,6%	0,4%	0,4%	4,6%	4,7%	5,8%	5,6%	6,1%
	Index	100	195	242	4 178	17 134	13 536	3 149	3 119	32 672	36 301	45 585	43 947	51 547
Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Index of debits		100	124	144	150	192	203	194	190	187	207	213	215	236

TABLE 2a Hungary:
Proportions Of Credits Flowing From Other Sectors To The Banking Sector (Sectors Are Creditors, Banks Are Debtors)

	Credits		Banking Sector												
			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	Households	Share	39,5%	41,6%	45,4%	47,5%	45,5%	46,7%	46,0%	45,5%	47,3%	46,5%	44,2%	43,8%	41,1%
		Index	100	105	106	107	107	112	114	116	123	126	138	144	154
2	Non-financial companies	Share	25,1%	22,4%	22,2%	23,5%	23,4%	21,6%	22,9%	23,9%	24,3%	26,1%	24,1%	22,5%	21,9%
		Index	100	89	81	83	86	81	89	96	99	111	118	117	129
3	Public Sector	Share	7,1%	6,7%	5,5%	4,9%	4,7%	4,3%	4,1%	4,2%	4,8%	4,9%	4,0%	4,6%	3,4%
		Index	100	93	70	61	61	57	56	59	69	73	70	83	71
4	Rest of World	Share	9,9%	11,8%	15,6%	15,9%	20,1%	22,4%	23,4%	23,6%	21,3%	19,2%	25,4%	25,9%	29,7%
		Index	100	119	145	143	188	214	230	240	220	208	316	340	443
5	Central Bank	Share	17,4%	16,1%	10,0%	6,2%	4,0%	3,3%	2,0%	1,3%	0,6%	0,3%	0,1%	0,1%	0,0%
		Index	100	92	53	32	21	18	11	8	4	2	1	1	0
6	Non-bank Fin. Companies	Share	1,1%	1,4%	1,3%	1,9%	2,2%	1,7%	1,6%	1,5%	1,6%	3,0%	2,2%	3,0%	3,8%
		Index	100	129	112	157	194	148	143	139	157	300	255	370	526
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of credits		100	118	140	168	206	240	273	309	343	377	456	512	603

TABLE 2b Hungary:
Proportions of Debits of the Banking Sector with Respect to Other Sectors (Sectors Are Debtors, Banks Are Creditors)

Debits			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
									Banking Sector						
1	Households	Share	15,0%	14,0%	10,5%	8,6%	7,2%	7,1%	7,6%	9,4%	12,3%	17,7%	23,1%	24,8%	25,6%
		Index	100	95	67	50	44	44	53	70	92	148	227	271	331
2	Non-financial companies	Share	39,0%	41,4%	39,1%	43,0%	47,2%	47,0%	44,6%	50,2%	48,4%	43,2%	43,0%	41,3%	38,4%
		Index	100	108	96	96	111	112	121	143	139	139	162	173	191
3	Public Sector	Share	2,0%	4,1%	4,7%	2,8%	2,1%	1,8%	2,3%	2,2%	3,2%	7,4%	5,0%	4,0%	4,3%
		Index	100	209	223	120	94	82	119	122	176	460	363	324	413
4	Rest of World	Share	7,7%	5,7%	5,5%	8,6%	12,8%	15,7%	15,7%	11,8%	16,2%	10,8%	11,1%	9,7%	9,0%
		Index	100	76	69	98	153	192	217	171	239	176	213	206	228
5	Central Bank	Share	35,8%	34,1%	39,5%	36,0%	29,7%	26,6%	27,5%	22,2%	14,8%	13,4%	8,4%	10,1%	12,9%
		Index	100	97	105	88	76	69	81	69	46	47	34	46	70
6	Non-bank Fin. Companies	Share	0,5%	0,7%	0,7%	1,0%	1,1%	2,0%	2,4%	4,1%	5,2%	7,5%	9,5%	10,1%	9,8%
		Index	100	125	123	171	190	344	472	850	1 093	1 759	2 609	3 086	3 568
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of debits		100	121	146	165	204	238	295	340	377	441	543	645	791

	Credits		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
								Banking Sector							
1	Households	Share	50,4%	50,1%	52,8%	52,1%	55,5%	58,1%	54,7%	59,3%	58,3%	57,2%	52,0%	48,5%	46,4%
		Index	100	102	110	121	111	139	145	164	172	163	157	152	154
2	Non-financial companies	Share	22,4%	25,1%	21,7%	21,3%	23,6%	23,1%	23,7%	20,4%	21,3%	22,1%	25,3%	29,2%	31,8%
		Index	100	115	102	111	106	125	142	127	142	142	172	206	238
3	Public Sector	Share	4,3%	4,3%	4,9%	5,3%	6,7%	6,3%	6,1%	6,0%	5,6%	6,7%	6,3%	7,3%	8,0%
		Index	100	102	120	143	156	178	188	195	195	224	224	269	312
4	Rest of World	Share	5,0%	4,4%	4,5%	4,9%	5,8%	6,1%	9,1%	8,3%	8,8%	9,2%	11,8%	10,2%	8,7%
		Index	100	90	96	114	116	148	245	231	262	265	360	324	292
5	Central Bank	Share	10,0%	8,2%	6,9%	7,1%	6,2%	3,8%	3,0%	2,5%	1,9%	1,3%	1,1%	1,0%	0,7%
		Index	100	84	73	84	63	46	40	35	28	19	17	16	11
6	Non-bank Fin. Companies	Share	8,0%	8,0%	9,1%	9,3%	2,3%	2,5%	3,4%	3,5%	4,1%	3,4%	3,4%	3,9%	4,5%
		Index	100	101	119	135	29	38	56	61	76	61	64	76	95
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of credits		100	136	179	238	235	315	374	429	483	474	507	545	590

TABLE 3b Poland: Proportions of Debits of the Banking Sector with Respect to Other Sectors

	Debits		Banking Sector												
			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	Households	Share	3,5%	4,1%	5,2%	8,7%	12,4%	13,3%	16,4%	18,3%	18,0%	20,7%	22,7%	23,8%	28,0%
		Index	100	112	147	255	350	408	583	699	761	852	992	1121	1399
2	Non-financial companies	Share	48,3%	46,8%	47,3%	50,8%	58,9%	60,4%	57,6%	55,0%	49,7%	50,4%	48,6%	42,5%	39,9%
		Index	100	93	96	108	120	134	148	152	152	150	154	145	144
3	Public Sector	Share	3,0%	1,1%	1,5%	1,7%	2,3%	3,7%	5,1%	2,6%	3,7%	4,8%	6,0%	5,7%	5,2%
		Index	100	34	48	56	74	130	207	115	178	226	303	308	299
4	Rest of World	Share	19,8%	23,1%	16,5%	13,1%	16,8%	9,9%	13,6%	16,7%	19,1%	15,9%	15,6%	21,8%	21,5%
		Index	100	112	82	68	84	54	86	113	143	116	121	182	189
5	Central Bank	Share	7,2%	7,2%	9,1%	6,8%	8,5%	10,9%	4,2%	3,9%	6,7%	5,0%	3,7%	3,7%	2,7%
		Index	100	97	124	98	117	163	73	72	139	101	80	84	67
6	Non-bank Fin. Companies	Share	18,3%	17,7%	20,4%	19,1%	1,1%	2,0%	3,1%	3,4%	2,9%	3,2%	3,3%	2,6%	2,7%
		Index	100	93	110	108	6	11	21	25	24	25	27	24	26
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of debits		100	127	167	210	231	281	348	410	480	476	508	567	613

TABLE 4a Slovakia:
Proportions of Credits Flowing from Other Sectors to the Banking Sector (Sectors Are Creditors, Banks Are Debtors)

Credits			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
								Banking Sector							
1	Households	Share	46,4%	47,6%	47,8%	53,1%	57,0%	61,3%	64,0%	60,9%	59,5%	58,8%	55,6%	49,2%	48,0%
		Index	100	102	117	155	171	179	177	173	175	170	152	137	136
2	Non-financial companies	Share	26,1%	25,5%	23,6%	22,2%	19,0%	16,4%	17,6%	20,8%	21,9%	24,7%	29,3%	29,2%	31,9%
		Index	100	97	103	115	102	86	87	106	114	127	143	145	161
3	Public Sector	Share	4,6%	7,2%	12,0%	9,8%	7,8%	5,7%	4,6%	5,8%	7,6%	7,8%	7,6%	11,9%	13,4%
		Index	100	154	294	285	236	168	128	165	222	226	207	335	379
4	Rest of World	Share	0,1%	0,2%	0,2%	0,6%	1,0%	0,9%	0,9%	1,1%	1,3%	2,1%	1,2%	1,0%	1,6%
		Index	100	129	142	632	1 036	856	797	1 037	1 316	2 041	1 120	989	1 542
5	Central Bank	Share	16,5%	13,4%	10,9%	9,0%	10,6%	12,1%	7,7%	6,1%	4,5%	1,9%	1,3%	0,7%	0,8%
		Index	100	81	75	74	90	100	60	49	38	15	10	5	6
6	Non-bank Fin. Companies	Share	6,3%	6,1%	5,5%	5,3%	4,5%	3,6%	5,2%	5,3%	5,3%	4,7%	5,0%	8,0%	4,4%
		Index	100	95	100	114	100	78	105	110	114	101	102	164	91
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of credits		100	112	141	178	195	203	211	244	270	274	282	309	322

TABLE 4b Slovakia:
Proportions of Debits of the Banking Sector with Respect to Other Sectors (Sectors Are Debtors, Banks Are Creditors)

	Debits		Banking Sector												
			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	Households	Share	11,1%	10,0%	8,9%	7,6%	8,3%	10,2%	10,6%	10,6%	13,8%	14,3%	17,5%	18,7%	19,0%
		Index	100	79	73	77	84	98	97	90	98	110	139	178	243
2	Non-financial companies	Share	80,4%	79,1%	78,0%	77,0%	73,3%	73,9%	73,4%	69,6%	57,5%	49,5%	46,4%	32,8%	28,7%
		Index	100	88	90	108	103	98	93	82	56	53	51	43	51
3	Public Sector	Share	1,7%	2,0%	1,5%	1,8%	1,8%	2,4%	1,9%	1,7%	3,3%	4,4%	3,7%	5,4%	3,1%
		Index	100	104	80	122	121	149	113	96	154	224	191	339	262
4	Rest of World	Share	0,1%	0,0%	0,4%	1,5%	2,5%	3,3%	1,9%	1,2%	1,1%	1,2%	2,4%	1,9%	1,9%
		Index	100	42	713	3 239	5 214	6 539	3 667	2 095	1 621	1 929	3 925	3 746	5 194
5	Central Bank	Share	3,9%	5,9%	7,6%	7,7%	9,5%	8,0%	9,6%	14,4%	20,3%	26,0%	24,8%	34,8%	41,5%
		Index	100	135	181	224	274	218	250	351	411	573	565	951	1522
6	Non-bank Fin. Companies	Share	2,9%	3,0%	3,7%	4,4%	4,6%	2,3%	2,6%	2,5%	4,0%	4,5%	5,3%	6,5%	5,8%
		Index	100	93	118	174	182	85	91	84	111	135	164	240	291
	Sum of shares		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Index of debits		100	101	115	149	158	159	167	175	156	175	197	254	350

the Czech Republic when the increase in financial flows indices is compared. The index grows over the period under research and reaches 603 (debts) and 791 (credits). Poland records the second largest growth in debt and credit indices (*Table 3*) after Hungary. In terms of banking intermediation, this is the most balanced country in our sample as the index growth over the period under research reaches 590 (debts) and 613 (credits). Slovakia is, in terms of banking intermediation (*Table 4*), comparable to the Czech Republic. However, the growth rate of the index over the period under research has greater dynamics as it reaches 322 (debts) and 350 (credits).

Clearly, among the Visegrad Four countries two groups are formed. Hungary and Poland exhibit a much larger increase in financial flows going between banks and other economic sectors when compared to the Czech Republic and Slovakia. This result might be due to the different institutional aspects associated with the privatization of banks as well as the emergence of the banking sector in general. In particular, Hungary and Poland completed bank privatization several years before the Czech Republic and Slovakia, albeit in Poland state involvement has not yet fallen below 10 %. We shed more light on this issue in the next section.

4.2 Structural Breaks in Financial Flows

The proportions of financial flows in *Tables 1–4* vary greatly across sectors as well as countries. This is quite understandable given the nature of the transformation process described earlier that has heavily affected economic development, including the banking sector. As documented by the literature on bank efficiency cited above, privatization is the most important factor that influenced the improvement of efficiency. Based on this empirical observation we put forward that privatization is possibly a major force behind the change in the structure of the financial flows within the banking sector. Unfortunately, the small extent of our data sample is obstructive to standard econometric testing of causal links. On the other hand, we aim to provide indirect evidence for the above assertion.

We formulate the following hypothesis:

Hypothesis 1: There are no structural breaks in the credit and debit flows between various sectors of the economy.

If rejected, then under the alternative hypothesis the financial flow data would exhibit a structural break. If a break occurs in the year when the privatization of the banking sector was completed, even without a solid causal link, we would be able to pair privatization with such a change.

We test the hypothesis by running a sequence of Chow (1960) breakpoint tests for each series of financial flow proportions. The Chow test is an econometric test of whether the coefficients in two linear regressions on different data are equal. The Chow test is most commonly used in time series analysis to test for the presence of a structural break in some or all of the parameters of a model and for this reason it is an ideal procedure to test our hypothesis. The Chow test statistic is defined as:

$$\frac{(S_C - (S_1 + S_2))/k}{(S_1 + S_2)/(N_1 + N_2 - 2k)} \tag{6}$$

where S_C is the sum of squared residuals from the entire data series, S_1 is the sum of squares from the first segment of the data, and S_2 is the sum of squares from the second segment of the data. N_1 and N_2 are the number of observations in each segment and k is the total number of parameters ($k = 1$ in a change in mean specification). The test statistic follows the F-distribution with k and $(N_1 + N_2 - 2k)$ degrees of freedom.

For our specific case, we aim to test whether the mean of the series of the flow ratios is the same before and after privatization was concluded. If there is a change in mean in a specific series, it is detected through a significant value of the statistics along with the year it occurred. The test is simple in its construction and serves our purpose well given our limited data sample. The results are presented in *Table 5* for each country separately. There are only a few insignificant coefficients: about one-third for credits and one-sixth for debits.

The test delivers overwhelming evidence of a change in mean, so we are able to reject the hypothesis of no-break in the majority of the flow proportions. The structural breaks occur in 2001 in the data for the Czech Republic, 1996–97 for Hungary, 1999 for Poland, and 2001 for Slovakia. Structural changes coincide with the conclusion of crucial ownership changes in privatization (recall Section 2 and *Figure 1*). These findings, albeit indirectly, suggest that privatization may be identified as an important factor behind the dramatic change in the extent of credit and debit flows between various sectors of the economy. Especially the financial flows between the banking sector and the central bank and between the banking sector and non-banking financial institutions are shown to change significantly in all four countries from the pre-break to the post-break period.

4.3 Intermediation Ratios: Banking Sector Hypotheses

Intermediation ratios (IR) indicate the portions of total financial flows of non-financial sectors that are channeled to (from) financial intermediaries as opposed to claims on (from) other non-financial sectors. Based on the intermediation ratios we are able to test stylized hypotheses about the character of the financial sector (bank-based vs. capital-based) that has developed so far in the Visegrad Four countries as well as about investment and funding patterns.

First we test the hypothesis that is related to the development of the financial system. As there is no sensible reason for transition economies to have a market-based financial system upon transition, the analysis is aimed at the development of the financial system over the course of time.

Hypothesis 2: The trends in the ratio of non-financial sector deposits and loans with banks to the total financial assets of the non-financial do not increase.

The above hypothesis can be interpreted in the following way. If the ratio of non-financial sector deposits with banks to the total financial assets of the non-financial sector is increasing, then the financial system becomes more bank-based and less capital-based over time. The opposite trend would hint at the fact that banking is a declining industry. In a similar fashion, if the ratio of non-financial sector loans received from banks to the total financial assets of the non-financial sector is increasing, then the financial system becomes more bank-based and less capital-based over time.

TABLE 5 Structural Breaks in Financial Flows

	Czech Republic			Hungary			Poland			Slovakia		
	Year of break	Dir.	F-stat	Year of break	Dir.	F-stat	Year of break	Dir.	F-stat	Year of break	Dir.	F-stat
Change in mean in proportions of credits flowing from the sectors to the banking sector												
Households	2000**	↑	5,0	1996*	↑	18,2	no break	-	0,5	no break	-	0,0
Non-financial Companies	2000*	→	4,0	no break	-	3,0	no break	-	1,7	2001**	↑	7,8
Public Sector	2001**	↑	6,9	1997*	→	3,2	no break	-	2,1	no break	-	2,6
Rest of World	no break	-	2,1	1997***	↑	59,1	1999***	↑	55,9	2001***	↑	13,4
Central Bank	2001***	→	14,5	1996***	→	72,0	1999***	→	43,0	2001***	→	31,8
Non-bank Financial Companies	no break	-	0,4	1996***	↑	15,7	1999**	→	6,4	no break	-	0,2
Change in mean in proportions of debits of the banking sector with the sectors												
Households	2001***	↑	10,0	no break	-	0,8	1999***	↑	38,8	2001***	↑	47,6
Non-financial Companies	2001***	→	65,3	1996**	↑	6,8	no break	-	0,5	2001***	→	54,4
Public Sector	2001***	↑	38,1	no break	-	2,0	1999***	↑	8,1	2001***	↑	38,1
Rest of World	no break	-	2,1	1997*	↑	22,8	no break	-	0,0	no break	-	0,4
Central Bank	2001***	↑	16,5	1996**	→	12,4	1999***	→	26,5	2001***	↑	42,5
Non-bank Financial Companies	2001***	↑	152,1	1997*	↑	16,8	1999***	→	11,2	2001***	↑	14,3

Note: *, ** and *** stand for the rejection of H0 at the 10%, 5% and 1% levels, respectively.

In the case of two hypothetical break dates, the higher *F*-statistic and corresponding year is reported.

Dir. stands for the direction of the break: ↑ denotes upward change in mean, ↓ denotes downward change in mean.

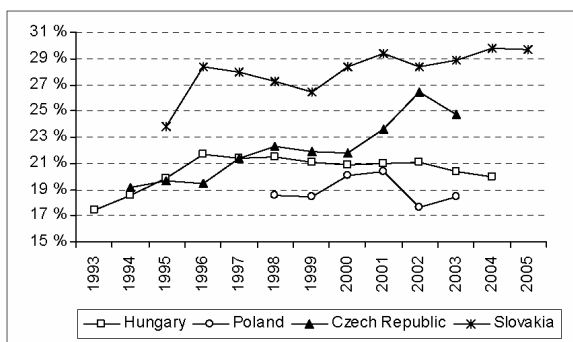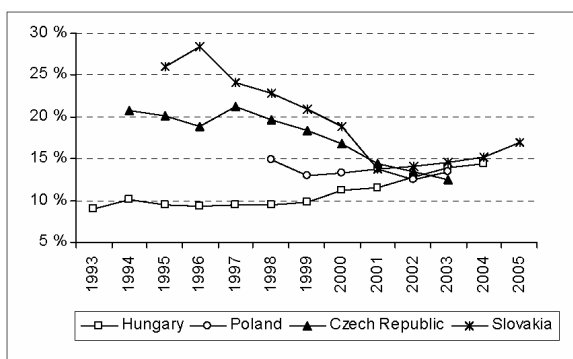FIGURE 2 Non-financial Sector Deposits / Total Financial Assets of the Non-financial
Sector

FIGURE 3 Loans to the Non-financial sector / Total Financial Liabilities of the Non-
-financial Sector

The hypothesis is tested by using the partial credit-IR of all Non-financial
Sectors with Banks shown in *Figure 2*, and the partial debit-IR of all Non-financial
Sectors with Banks shown in *Figure 3*. In addition to the graphical presentation we
also formally test for the trend and significance of its coefficient. The ratios of non-
-financial sector deposits with banks to the total financial assets of the non-financial
sector exhibit an increasing trend with a significant coefficient in the case of the Czech
Republic (time trend 0.01 at 1 %), Poland (0.005 at 1 %) and Slovakia (0.004 at 1 %);
thus the hypothesis is rejected. For Poland we observe a small negative trend that is
not significant (–0.001 N/S); this finding has to be considered with caution since
the Polish data series is very short. Based on our findings, we conclude that the finan-
cial system in the Visegrad Four group is not becoming more capital-based; on
the contrary it is a bank-based system.

In terms of the loans that banks provide to the non-financial sector, the ratio of
loans to total financial liabilities in the non-financial sector is decreasing in the Czech
Republic (trend –0.01 at 1 %) and Slovakia (–0.01 at 1 %); thus the hypothesis can-
not be rejected. This means that in these two countries the non-financial sector is in-
creasingly seeking and obtaining funds from sources other than banks. In this sense

we cannot reject the hypothesis that the financial system is becoming more capital-based. This result weakens the previous evidence based on the deposit ratio for these two countries. For Hungary the figure shows an inconclusive pattern for the period 1993–1999, but the ratio increases afterwards. The overall trend has a positive significant coefficient of 0.02 at 10 %; thus the hypothesis is rejected. So, in terms of loans to the non-financial sector, the financial system is becoming more bank-based. Further, from *Tables 1b–4b* we observe a decreasing or stagnant share of bank lending to the corporate sector. It should be noted that many enterprises in the Visegrad Four countries have foreign owners and may find it easier to borrow directly from abroad either from their parent companies or from foreign banks. This means that a decline in bank lending to the corporate sector would not necessarily result in a more capital-based system. Finally, a short data span and an unclear pattern prevent strong conclusions for Poland. When we compare the results of the hypothesis testing with the extent of the financial flows described in Section 4.1, then the conclusion tends towards a quite active role of banks in financial intermediation.

Our other hypothesis is related to the role of banks as mobilizers of savings from non-banking financial institutions. As the key business of banks is financial intermediation in terms of acquiring deposits and providing loans, the banks should attract funds from all sectors including non-banking financial institutions.

Hypothesis 3: The trend in the ratio of the funds that banks receive from (provide to) non-banking financial institutions does not increase (decrease).

The above hypothesis can be interpreted in the following way. If the ratio of the funds that banks receive from non-banking financial institutions is increasing, then the role of banks as mobilizers of savings from the non-banking financial sector is not declining. In a similar fashion, the opposite trend would be present in the case of funds that banks make available to the non-banking financial sector. We test this hypothesis by examining what fraction of bank funds comes from or goes to non-banking financial institutions.[9] Unfortunately, due to the lack of data on the total financial assets and liabilities of banks we are not able to test this hypothesis for Slovakia.

Figure 4 graphically presents the ratios of the funds banks receive from non-banking financial institutions to the total of banks' financial assets. The ratios exhibit an increasing pattern for all three countries with a positive and statistically significant trend coefficient (Czech Republic 0.003 at 1 %, Hungary 0.005 at 1 %, and Poland 0.002 at 10 %). Agreeing with this, in *Figure 5* the fraction of funds that banks make available to non-banking financial institutions to the total of their financial liabilities declines on average. The trend coefficient is negative and statistically significant in the case of Hungary (–0.007 at 1 %) and Poland (–0.019 at 10 %), and negative but insignificant in the Czech Republic (–0.006 N/S). This combined evidence compellingly shows that the role of banks as mobilizers of savings from the non-financial sectors does not decline.

[9] We do not investigate the extent of financing provided via capital markets as comparable data are not available and this exercise is beyond the scope of this paper.

FIGURE 4 Non-securitized Financial Assets of Banks from Non-banking Financial
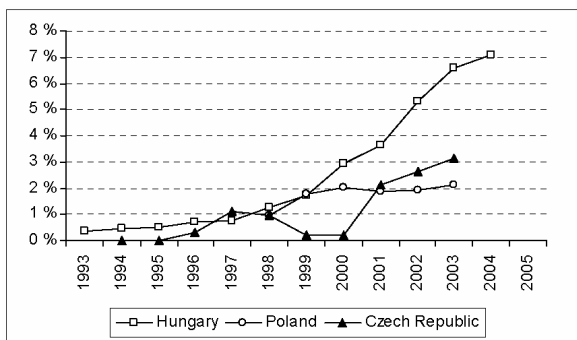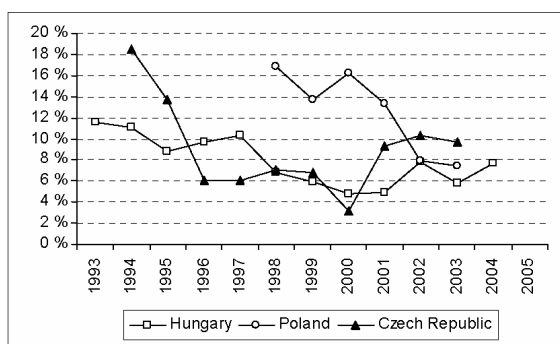Institutions / Total Financial Assets of Banks

FIGURE 5 Non-securitized Financial Liabilities of Banks to Non-banking Financial
Institutions / Total Financial Liabilities of Banks

5. Conclusions

We have analyzed the development of the financial system in the Visegrad
Four group of countries (the Czech Republic, Hungary, Poland and Slovakia) in order
to assess whether there is a common pattern of structural change, whether banks lose
importance in the process of economic transformation and whether these four finan-
cial systems have become more similar.

The empirical results on monetary flows between various sectors and com-
mercial banks show that in terms of credit households are the largest creditors of
the commercial banks in the Czech Republic, Hungary, Poland and Slovakia. Non-
-financial companies are the second largest group in all four countries in general. In
terms of debit non-financial companies are the largest borrowers uniformly across
the four countries in general. Further, among the Visegrad Four countries two groups
are formed. Hungary and Poland exhibit a much larger increase in financial flows
going between banks and other economic sectors when compared to the Czech Re-
public and Slovakia. Further, we identified structural breaks in the majority of finan-
cial flow series. In all four countries the breaks in mean appear in the year when
the privatization of the banking sector was completed. Despite the fact that such

evidence is only indirect, we conjecture that completed privatization was an important factor behind a dramatic change in the extent of credit and debit flows. There is empirical evidence of the improved performance of banks after thorough privatization. Hence, the policy implication would be to adequately privatize the banking sector in other countries where transition still continues.

We also test two hypotheses related to the viability of the banking sector. In general we find quite an active role of banks in financial intermediation. Based on the evidence, we conclude that the role of banks as mobilizers of savings from the non-financial sectors did not decline and that banking was not a declining industry in the Visegrad Four countries. The high level of financial intermediation performed by banks, and in particular the transformation of deposits into loans which entail the monitoring of borrowers, and the qualitative transformation of capital indicate that banks play an important role in the economies of these new EU members. Certainly neither during the transformation process nor shortly after joining the EU do we observe disintermediation or a loss of the importance of the banking sector in the Visegrad Four group. The implication is that the banking sector is developing successfully the Visegrad Four group. Further, ownership links with banks in the old EU countries should enhance the banking sector in the new EU countries, helping them to successfully integrate into the financial sector of the euro zone.

REFERENCES

Abel I, Siklos LP (2004): Secrets to the successful Hungarian bank privatization: the benefits of foreign ownership through strategic partnerships. *Economic Systems*, 28(2):111–123.

Allen F (1990): The market for information and the origin of financial intermediation. *Journal of Financial Intermediation*, 1(1):3–30.

Barisitz S (2005): Banking in Central and Eastern Europe since the Turn of the Millennium – An Overview of Structural Modernization in Ten Countries. *Focus on European Economic Integration* (Vienna, Oesterreichische Nationalbank.), 2:58–82.

Bhattacharya S, Thakor AV (1993): Contemporary Banking Theory. *Journal of Financial Intermediation*, 3(1):2–50.

Bonin JP, Hasan I, Wachtel P (2005a): Bank Performance, Efficiency and Ownership in Transition Countries. *Journal of Banking and Finance*, 29(1):31–53.

Bonin JP, Hasan I, Wachtel P (2005b): Privatization Matters: Bank Efficiency in Transition Countries. *Journal of Banking and Finance*, 29(8-9):2155–2178.

Boyd JH, Gertler M (1995): Are Banks Dead? Or Are the Reports Greatly Exaggerated? *Quarterly Review*, *Federal Reserve Bank of Minneapolis*, issue Summer: 2–23.

Calomiris CW, Kahn CM (1991): The role of demandable debt in structuring optimal banking arrangements. *American Economic Review*, 81(3):497–513.

Chow GC (1960): Tests of Equality between Sets of Coefficients in Two Linear Regressions. *Econometrica,* 28(3):591–605.

Cottarelli C, Dell'Ariccia G, Vladkova-Hollar I (2005): Early birds, late risers, and sleeping beauties: Bank credit growth to the private sector in Central and Eastern Europe and in the Balkans. *Journal of Banking & Finance*, 29(1):83–104

Dahiya S, Saunders A, Srinivasan A (2003): Financial Distress and Bank Lending Relationships. *Journal of Finance*, 58(1):375–99.

Diamond DW (1984): Financial intermediation and delegated monitoring. *Review of Economic Studies*, 51(3):393–414.

Diamond DW, Dybvig P (1983): Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, 91(3):401–419.

Fries S, Taci A (2005): Cost Efficiency of Banks in Transition: Evidence from 289 Banks in 15 Post--communist Countries. *Journal of Banking and Finance*, 29(1):55–81.

Fries S, Neven D, Seabright P, Taci A (2006): Market Entry, Privatization and Bank Performance in Transition. *Economics of Transition*, 14(4):579–610.

Gurley JG, Shaw ES (1955): Financial aspects of economic development. *American Economic Review*, 45(4):515–538.

Gurley JG, Shaw ES (1960): Money in a Theory of Finance. Brookings Institution, Washington DC.

Hanousek J, Kočenda E, Svejnar J (2007): Origin and Concentration: Corporate Ownership, Control and Performance in Firms after Privatization. *Economics of Transition*, 15(1):1–31.

Harper JT (2002): The performance of privatized firms in the Czech Republic. *Journal of Banking & Finance*, Elsevier, 26(4):621–649.

Hermes N, Lensink R (2000): Financial system development in transition economies. *Journal of Banking and Finance*, 24(4):507–524.

James C (1987): Some Evidence on the Uniqueness of Bank Loans. *Journal of Financial Economics*, 19:217–235.

Jurča P, Ličák M, Rychtárik S (2005): Structural Trends and Risks in the Banking Sector. *Biatec*, National Bank of Slovakia, 13(11):2-9.

King RG, Levine R (1993a): Finance and Growth: Schumpeter Might Be Right. *Quarterly Journal of Economics*, 108(3):717–737.

King RG, Levine R (1993b): Finance, Entrepreneurship, and Growth: Theory and Evidence. *Journal of Monetary Economics*, 32:513–542.

Levine R, Zervos S (1998): Stock Markets, Banks, and Economic Growth. *American Economic Review*, 88:537–558.

McCauley RN, Seth R (1992): Foreign bank credit to U.S. corporations: the implications of offshore loans. *Quarterly Review*, *Federal Reserve Bank of New York*, issue Spring:52–65.

Miani S, Sagan K (2006): The Role of Foreign Banks in Poland. *Transition Studies Review*, 13(2): 255–269.

Miller G (1998): The Obsolescence of Commercial Banking. *Journal of Institutional and Theoretical Economics*, 154:61–73.

Nollen S, Kudrna Z, Pazderník R (2005): The Troubled Transition of Czech Banks to Competitive Markets. *Post-Communist Economies*, 17(3):361–380.

Pistor K, Raiser M, Gelfer S (2000): Law and Finance in Transition Economies. The *Economics of Transition*, The European Bank for Reconstruction and Development, 8(2):325–368

Reininger T, Schardax F, Summer M (2002): Financial System Transition in Central Europe: The First Decades. SUERF Studies, SUERF – The European Money and Finance Forum, No. 16, ed. by Morten Balling.

Schmidt RH, Hackethal A, Tyrell M (1999): Disintermediation and the Role of Banks in Europe: An International Comparison. *Journal of Financial Intermediation*, 8(1-2):36–67.

Stiglitz JE (1985): Credit Markets and the Control of Capital. *Journal of Money, Credit and Banking*, 17(2):133–52.

Stiglitz JE (1994): The role of the state in financial markets. In: *Proceedings of the World Bank Annual Conference on Development Economics* (Eds.: M. Bruno and B. Pleskovic), 19–52, World Bank, Washington DC.

Townsend RM (1979): Optimal contracts and competitive markets with costly state verification. *Journal of Economic Theory*, 21(2):265–293.

Wachtel P (2006): Policy issues relevant to transition and emerging market economies: Papers from the 10th Dubrovnik Economic Conference. *Journal of Banking & Finance*, 30(5):1333–1334.

Weill L (2003): Banking efficiency in transition economies. The *Economics of Transition*, The European Bank for Reconstruction and Development, 11(3):569–592.