

Eesti Pank (Bank of Estonia)

The Structure and Functioning of the Financial Sector in Estonia

Workshop on Financial Sector Issues in Accession Countries

On 24–25 October 2001 European Central Bank held a workshop in Frankfurt am Main on “Financial Sector Structure and Functioning in Accession Countries”. The workshop was meant as preparatory to the up-coming high-level Berlin Seminar on the same issues in December 2001. Head of the Central Bank Policy Department Ilmar Lepik and Senior Economist Jaak Tõrs represented Eesti Pank at the workshop. The current paper is Estonia’s contribution to the workshop outlining the structure and functioning of the financial sector in Estonia.

Contents

Introduction	3
1. Overview of the Structure of Financial Markets	5
1.1. Banking Sector	5
1.1.1. Institutional Development	5
1.1.2. Bank Assets and Liabilities	6
1.1.3. Lending Channel for Banks – Leasing Subsidiaries	6
1.2. Money Markets	7
1.2.1. Debt Securities Market	7
1.2.2. Forex Market	8
1.2.3. Estonian Kroon Interbank Money Market	8
1.3. The Stock Market	10
1.4. Other Financial Markets	11
1.4.1. Insurance	11
1.4.2. Investment Funds	11
1.5. Settlement and Payments Systems	12
1.5.1. Interbank Settlement System	12
1.5.2. Payment Instruments	13
2. Financial Flows and Financial Intermediation	14
2.1. The Evolution and Structure of Foreign Capital Flows: Impact on the Financial Sector	14
2.1.1. Foreign Investments	14
2.1.2. Financial Sector and Foreign Capital Flows	15
2.2. The Role of Financial Sector Intermediation	15
Box 1: Financial Deepening – Evidence of Convergence	18
3. Monetary Transmission Process in Estonia – Empirical Evidence	19
3.1. Cross-border Transmission of Interest Rates – the Interbank Money Market	19
3.1.1. Short-term Rates	19
3.1.2. Longer Rates – the Issue of Yield Curve	21
3.2. Transmission of Impulses into Retail Rates	21
3.3. Impacts on Real Activity and Inflation	23
Box 2: Determination of the Yield Curve in the Absence of Government Securities Market	24
4. Safeguarding the Financial Stability	25
4.1. Banking Sector Supervision	25
4.1.1. Current Organizational Structure	25
4.1.2. New Aspects in Banking Supervision	26
4.2. Building a New Supervision Agency	27
4.3. Financial Sector Safety Net Issues	27
4.3.1. The Currency Board Arrangement (CBA) and the Lender of Last Resort (LLR) Function	27
4.3.2. Operational Framework	28
4.3.3. Crisis Prevention	29
4.3.4. Deposit Insurance	30
Statistical Appendix	31

Introduction

The timeframe of the development of Estonian financial sector is constrained within one decade – 1992—2001, as the re-introduction of the national legal tender in Estonia in June 1992 can be considered the real starting point for financial sector reforms. Developments before 1992 were largely of premature nature and hence can be treated as background information only.

In this light, **financial sector reforms started** in the environment of a fixed exchange rate and a currency board arrangement (CBA), liberal external policies, involving most importantly an immediate abolishment of most restrictions on capital account transactions. There are no capital controls since 1994. In this environment, the strength of the financial sector became a crucial issue almost immediately, given the limited lender-of-last-resort ability due to the CBA. Additionally, bearing in mind that fiscal stability is one of the cornerstones of CBA, the real economy was faced with a hard budget constraint since the beginning of the reforms.

The second phase in the development of the financial sector started in mid-1990. It was marked by increasing creditworthiness of Estonian enterprises and a growing presence of Estonian banks in European financial markets both in terms of investing and borrowing. The latter also marked an early integration into European markets and a trend towards internationalization of Estonian financial markets. This period also covered extensive privatization and consolidation in the financial sector.

The third major wave of changes came with the crises in Asia and Russia. These changes resulted in a more concentrated banking market and the entrance of strategic (mainly Scandinavian) investors. By the end of the last decade, privatization was fully completed. Deepening integration with European markets also led to the internationalization of domestic money markets. On domestic level, all leading banking institutions have evolved into banking groups covering all main financial sector activities – leasing, investment fund management, insurance, electronic banking services, etc, and provide a wide range of investment opportunities and other financial services.

The Estonian financial intermediation is based on the universal banking model, where banking sector has a dominant role and the share of securities market is relatively low. Estonian banking market is a concentrated, mainly foreign-owned and fully privatized market. Some specific features are stemming from (a) the small size of the country, (b) the short period of development, and (c) the status of Estonia as an EU accession country. Leading banking institutions have formed financial groups and are active in all three Baltic countries.

A comprehensive analysis of Estonian financial markets requires a broader context. Estonian money market cannot be viewed in a narrow sense for several reasons. First of all, Estonian money market should be treated together with foreign exchange market, as the forex market is a major market for liquidity management under CBA. Also, the boundaries of Estonian money market are stretched by the remarkable role of

Scandinavian financial institutions in Estonia. For generalizing purposes, it may be useful to take an even broader view and look at money, forex and short-term debt securities market as a single inter-linked complex.

Monetary transmission in Estonia has some special features. Two specific features deserve more attention: (a) under CBA, monetary policy signals are exogenous for the system (and hence sometimes hardly distinguishable from external shocks) and (b) the absence of a government securities market. Regarding the origination of monetary policy signals, we believe that Estonian monetary policy transmission experience may be beneficial in the light of EU and EMU accession. We also believe that the absence of a government securities market does not remarkably alter traditional monetary transmission channels. The main result of a missing government securities market in our view is a slight change in the information chain. The information contained in monetary transmission is reflected not in a traditional yield curve but rather in the money market curve (the short end) and the credit curve (the swap and lending rates in the long end).

An additional specific aspect in monetary transmission lies in the structure of financial intermediation. Due to high international integration of both the real economy and financial markets, a remarkable (close to 50%) share of the Estonian real economy is financed on intra-company basis or directly from European financial markets. Therefore, competition in the financial market is not limited to locally licensed institutions. Therein lies a further reason for treating Estonian financial intermediation in a broader context of European integration. In other words, longer interest rates are linked to both domestic money market rates and euro area inter-bank lending rates; hence they do not rely solely on domestic factors.

In terms of banking sector soundness, both the EU Peer Review and the Financial Sector Assessment Program by the IMF concluded that banking supervision has strengthened further and most standards are comparable with best international practice. Among other things, the Peer Review concluded that the Estonian financial sector crisis management policy has the necessary legal framework and a comprehensive set of tools. Regarding the financial sector safety net, all major building blocks are there, comprising (a) a monetary operational framework that is supportive despite the limited lender-of-last-resort facility under the CBA, (b) an operational deposit guarantee scheme and (c) an effective crisis prevention and resolution.

The first Chapter of the current paper presents general features of the Estonian financial structure. The Chapter covers banking market, money, debt securities, forex, and stock markets and other financial markets. Other markets cover insurance, investment funds, payments systems and instruments.

Chapter 2 is devoted to a more general discussion of financial intermediation issues, focusing mainly on the evolution of the banking sector and financial flows. The special issue box takes a closer look at the evidence of financial deepening.

The third Chapter deals with monetary transmission issues focusing on empirical evidence. The sub-chapters here include (a) cross-border transmission of interest rates (specific to a currency board), (b) transmission to retail rates, and (c) impact on real activity and inflation. As a special issue, monetary transmission under the absence of government securities market is analysed.

Finally, Chapter 4 is devoted to financial stability issues including the most current issues of supervision, building up a new supervision agency, and financial sector safety net issues: LLR facility, crisis prevention and deposit insurance.

1. Overview of the Structure of Financial Markets

1.1. Banking Sector

1.1.1. Institutional Development

Over the recent years, Estonian banking sector has proven its enhanced creditworthiness and competitiveness as compared to earlier periods or to the prevailing situation in other advanced transition countries. The banking sector reached approximately 96% private share in total capital already by end-1997. Rapid improvements in the legal and regulatory infrastructure have resulted in now generally sound banking system that is comparable to the best international practice.

Table 1. Selected indicators of banking

	1996	1997	1998	1999	2000
Number of commercial banks	13	11	6	7	7
Number of private banks	12	11	5	6	7
Number of state-owned banks	1	0	1	1	0
Concentration index C3 (%)	58.8	69.7	93.0	92.4	91.1
Concentration index C5 (%)	74.7	83.4	99.4	98.9	98.8
Total assets, EUR m	1,466.5	2,593.7	2,620.0	3,008.4	3,695.3
ROE	30.6%	34.9%	-10.1%	9.2%	8.4%
ROA	2.9%	3.3%	-1.2%	1.5%	1.2%
Capital adequacy, %	12.4	13.6	17.0	16.1	13.2
Total assets / GDP	43.8%	63.4%	55.7%	61.7%	67.7%
Foreign ownership in share capital	33.4%	44.2%	60.7%	61.6%	83.6%
Major foreign ownership in total assets	2.6%	2.3%	90.2%	89.8%	97.4%

However the process towards present stability has not been easy or straightforward. The number of credit institutions dropped dramatically from 42 banks in 1992 to 11 by end-1997. The succeeding so-called second-wave restructuring after the banking crisis in 1998 reduced the number of banks from 11 to 6. In 1999 a new bank got a licence from Eesti Pank (Bank of Estonia), so there are seven banks currently in the market. Essential consolidation and foreign capital inflow into the Estonian banking sector has improved its credibility by strengthening the rules for internal governance and promoting operational efficiency. Financial conglomerates of Swedish and Finnish origin hold 82% of banks share capital. The consolidated capital adequacy ratio of Estonian banking groups is a comfortable 14% on the average with no banks below the 10% minimum.

During the booming years of 1995–1997, quarterly return of capital (ROE) indicators were between 10–20%. The cool-down period after the stock market crash in late 1997 until mid-1999 turned profitability measures negative. Three recent years of recovery have stabilized the banks' return to capital ratio, which ranges around 3% on quarterly basis.

Economies of scale and advanced technologies exploited over recent years have played an important role in the banks' positive profitability outlook.

1.1.2. Bank Assets and Liabilities

Banks are still prevalent financial intermediaries with total assets accounting for almost 70% of GDP. Yearly asset growth has amounted to over 20% after the crisis in 1998. The relatively rapid growth is based on a strong increase in deposits; since the end of 1999, the deposit growth has been running clearly above the level of loan growth. Deposit expansion is supported by new attractive Internet and ATM facilities for customers as well as by better access to different bank services (credit cards, small financing etc). Hence, Estonian banks have become less dependent on foreign institutional borrowing as their domestic deposit base has been enlarged and interest rates have fallen to a very favourable level for banks.

In parallel foreign depositors, mainly private corporate clients, have gained importance in funding Estonian banks by making up about a quarter of all corporate deposits and 15% of total deposits. The client and maturity profile of non-resident-owned funds indicates their primary nature as a source for everyday cross-border business transfers.

The asset structure since 1996 indicates a tendency for an increasing share of loans to financial institutions, mostly internal group members – leasing subsidiaries. However, the largest share of assets is still attributable to claims on non-financial sector, averaging 40% of total assets and up to 65% of the loan portfolio.

An improving client profile allows banks to advance client relationships, which helps to monitor and assess credit risk more effectively. In addition, diversification of products and services offered reduces the concentration of instrument-related risks. For these reasons, the loan portfolio shows good quality, with the average share of loans past due at less than 6% and non-performing loans at less than 2% in 2001, meaning that banks have adopted provisioning rules and risk management as required by international standards.

The bank securities portfolio has followed a rather conservative pattern after the blow in the stock market in 1997. Dominant segment in securities portfolio is occupied by foreign debt securities. Growth of shares – strategic investments in associated and affiliated enterprises – has been exaggerated since April 2001 by the extension of the market share of Estonian banking groups in other Baltic countries (mainly in Lithuania). In contrast, the amount of shares held for trade or short-term investments has diminished remarkably over the last years, reaching a low 3% in 2001.

1.1.3. Lending Channel for Banks – Leasing Subsidiaries

Since its establishment in 1993, the leasing market has developed rapidly and has become an important funding alternative to bank loans both for enterprises and private individuals. Because the majority of leasing companies are owned by banks, the main source for financing for leasing companies is credit by parent-banks, but they are also able to raise funds from international capital markets with the guarantee of the parent bank. **Banks encourage leasing financing over ordinary bank loans mainly because of collateral ownership reasons.** According to leasing contracts, collateral will remain the property of

the leasing company, which makes the seizure of the collateral, if necessary, easier than in case of bank loans.

Among leasing instruments, the most popular are capital lease, sale by instalments and factoring. The structure of leased goods is relatively concentrated, being dominated by real estate (22%), individual cars (27%), commercial vehicles (20%) and investment goods (20%).

Table 2. Selected indicators of the leasing market

	1996	1997	1998	1999	2000	June 2001
Leasing portfolio (EUR m)	100	292	375	402	589	682
Factoring portfolio (EUR m)	10	23	24	31	55	81
Total leasing and factoring to GDP (%)	3%	8%	8%	9%	12%	12%
Number of leasing companies	4	4	5	5	5	5
o/w bank owned	4	4	4	4	4	4
o/w foreign subsidiaries	-	-	2	2	2	2

The main vulnerability of the leasing market is that difficulties in this sector can have an adverse impact on parent banks. Such an event can be triggered by the economic downturn and can lead to a significant rise in default rates on leasing contracts, considering the high concentration of contracts into specific sectors. Therefore, the growth and performance of leasing must be monitored closely. Leasing companies have been indirectly supervised by Banking Supervision since July 1998, when Eesti Pank introduced supervision of banks on consolidated basis.

1.2. Money Markets

Estonian kroon money market comprises short-term interbank deposits/loans, debt securities markets and forex forwards and swaps, as there are no treasury bills issued by the state. Compared to forex forward or debt securities market, interbank money market is more short-term, with main trading volumes in less than three-month segment. Comparing by turnover, the deepest segment is the forward market. Consequently, the integration between the three markets is stronger through interest arbitrage at the short end of the maturity spectrum.

1.2.1. Debt Securities Market

Unlike in many other countries, government securities have not been the driving force of the development of non-bank financial markets in Estonia due to prudent fiscal policies (see Box 2). Therefore the securities market in Estonia is primarily an equity market, and the debt market has developed only according to private sector instruments and needs, being mainly primary market with private placements and a modest secondary market.

Regardless of its small size, the fixed income instruments market has been an increasingly important provider of alternative financing for marketable companies and local governments. The main issuers on the market are Nordic financial conglomerates, which are also major stakeholders in Estonian credit institutions. Their bond issues cover approximately 85% of the primary market, reflecting the high integration of Estonian and Nordic financial markets.

Table 3. Selected indicators of the debt securities market

	1996	1997	1998	1999	2000	June 2001
Debt market capitalization (EUR m)	150	258	235	205	237	292
o/w non-resident investors (%)	19%	32%	16%	10%	3%	5%
Debt market turnover (EUR m)	20	482	1 078	466	194	163
Debt market capitalization to GDP (%)	4%	6%	5%	4%	4%	5%
Debt market turnover to capitalization (%)	13%	187%	458%	227%	82%	56%
New debt securities' issues (EUR m)	325	324	100	228	253	277
o/w public issues (by volume, %)	2%	2%	4%	4%	6%	2%

Because of widespread refinancing schemes, maturities of debt securities remain mainly short-term, most common instrument being a 3–6 month commercial paper (90% of bonds issued). Interest rates of debt securities have been following quite closely the interbank offer rate of TALIBOR. Benchmark for shorter maturities is the three-month interbank offer rate, interest rates of longer maturities coincide with the interest rates of bank loans of similar maturity.

1.2.2. Forex Market

Due to the currency board set-up, Eesti Pank offers credit institutions an unlimited forex purchase and sale facility for all major currencies (including the euro and USD) against the Estonian kroon. In practice Estonian commercial banks nowadays purchase the euro only from the central bank. This is related to the fact that there is no bid-offer spread for euro transactions. The forex window offered by Eesti Pank is the key element of the liquidity system. The fact that credit institutions are free to move their liquidity cross-border practically without costs makes liquidity management in deeper euro money and capital markets particularly attractive.

The turnover of the Estonian forex market (both spot and forward) is around four billion EUR per month (1.3 billion per ten days), whereas transactions involving Estonian kroon form about one fourth of the total trading volume. The other key trading currencies are the euro and the US dollar.

The main counterparts to domestic credit institutions are non-resident banks and resident companies. Non-resident banks are active equally in the spot and forward market and their share in total forex market turnover is nearly 50%. Companies have been relatively more active on the spot market and their share in total forex market turnover is about one third.

The main instruments traded in the Estonian forex market are spot transactions and forex swaps, with more or less equal trading volume in both. **The forex swap market in Estonia is more liquid than the money market and the transaction volumes are larger.** The main participants in the forex swap markets are domestic and foreign banks, followed by non-financial companies.

1.2.3. Estonian Kroon Interbank Money Market

During the past nine years interbank money market has undergone remarkable development. In the early years of the Estonian kroon, and despite the large number of

institutions, the volume of money market transactions was low and active trading was performed only in overnight funds. In general, during the times of high capital mobility and lower risks the interest rate margin between the Estonian kroon and German interest rates showed a declining pattern.

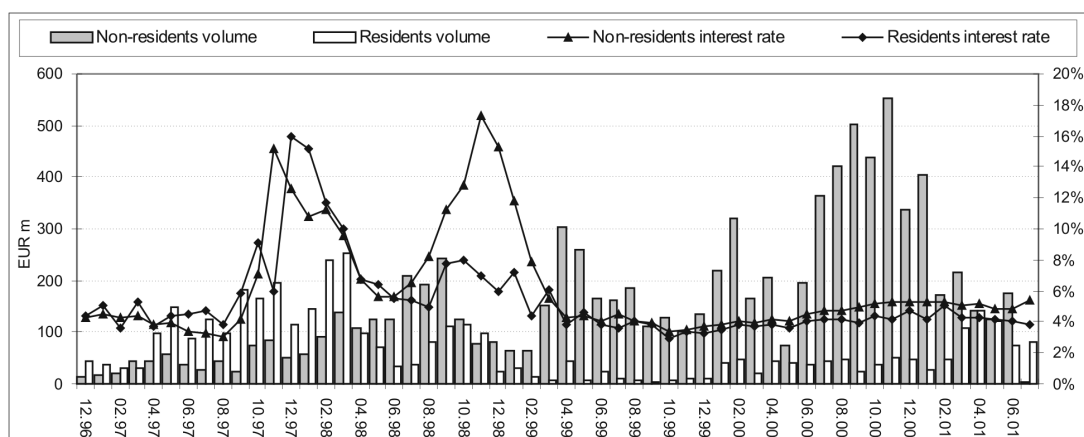


Figure 1. Turnover in unsecured short-term Estonian kroon loans market

In autumn 1997, the Asian crisis triggered short-selling of the Estonian kroon in the forex forward market. This put additional pressure on money interest rate quotations. A somewhat similar jump in short-term interest rates took place also during the Russian crisis even though trading volumes both in the forward and money market were more modest at the time.

In the aftermath of the Russian crisis, stabilization and re-capitalization of the banking system took place. Rapid growth of private sector savings in 1999 supported the increase in the liquidity buffers of the monetary system, which were also reflected in lower money market readings. By the end of 1999 the spread between TALIBOR and EURIBOR had fallen lower than the pre-Asian crisis level. Since Russian crisis most of the money market trading volume comes from transactions with non-residents.

Introduction of the euro established a new reference rate for the Estonian money market and created an attractive opportunity for Estonian banks to manage their liquidity in large euro area money and capital markets. **In 2000 and 2001, in a favourable liquidity environment the Estonian interbank money market rates have followed EURIBOR rates more closely than ever before and this trend can be expected to continue.** The recent changes in the minimum reserve system, where banks are allowed to fulfil the reserve requirements partly with high quality euro-denominated securities, should foster liquidity management on euro markets.

In case of Estonia, the foreign banks are very active in the short-term deposit and loans interbank market (see Figure 1). According to present rules, money market quotations (TALIBID/TALIBOR) are fixed by Eesti Pank daily at 11 AM according to the quotations by five major market players (Estonian: *Hansapank*, *Eesti Ühispank* (Union Bank of Estonia), *Sampo Pank*; Finnish: *Nordea Pankki*; Swedish: *Svenska Handelsbanken*).¹

¹ The quotations cover 1, 2, 3, 6, 9 and 12-month maturities.

1.3. The Stock Market

The structure and framework of the securities market have evolved during the last five years. Successful opening of the Tallinn Stock Exchange (TSE)² in 1996 was backed by investors' interest (both local and foreign) and remarkable investment. From November 1996 until September 1997, the number of traded companies increased fivefold. By excessive optimism of local investors, the abuse of leverage and changes in the external environment, the stock index increased threefold during a year, but after the Asian and Russian crises declined back to its starting point.

Table 4. Selected indicators of the stock market

	1996	1997	1998	1999	2000	June 2001
Stock market capitalization (EUR m)	508	837	531	1,809	1,982	1,811
o/w non-resident investors (%)	36%	42%	54%	75%	76%	76%
Stock market turnover (EUR m)	147	1,396	853	286	352	318
Stock market capitalization to GDP (%)	15%	20%	11%	37%	36%	31%
Stock market turnover to capitalization (%)	29%	167%	161%	16%	18%	18%
Number of stock listed (end of period)	8	22	25	23	20	19
Number of licenced securities brokers	45	45	34	23	22	22
o/w member firms of the TSE	18	25	20	12	8	9

After these events, the relatively low price level of stocks supported the foreign investors to acquire a majority stake in resident companies, which led to the delisting of several shares from the stock exchange. Foreign capital originated mainly from Sweden and Finland (respectively 52% and 9%). In 1999, when the listing of Eesti Telekom's shares took place, the capitalization of the stock exchange increased 2.5 times.

Considering the smallness and openness of Estonian economy, the development of the TSE called for integration with the securities market in adjacent regions. In April 2001, Helsinki Stock Exchange (HEX) acquired a 52.4% ownership in the TSE with the main aim to launch trading with Estonian securities in the HEX trading system. New ownership and co-operation arrangements between the HEX and the TSE should have a positive impact on liquidity in the Estonian securities market and facilitate the integration of Estonian securities market into the European markets.

The present regulatory and supervisory structure of the securities market involves three principal authorities: the Ministry of Finance, which grants and revokes licences of securities markets' participants; the Securities Inspectorate, which is responsible for supervising firms and investment funds which have been granted licences; and the TSE, which acts in a self-regulatory role in the supervision of its member firms. From January 2002, the Securities Inspectorate will become a part of the unified Financial Supervision Authority.

² TSE operates on an electronic online interactive trading system offering continuous quotation within an order-driven system. Clearing and settlement is processed on DVP basis.

1.4. Other Financial Markets

1.4.1. Insurance

Estonian insurance market has undergone various phases of development during the past years. It has gone through a vast growth in non-life sector in 1993 and thereafter, initiated by the introduction of compulsory motor TPL insurance. In 1998, the growth slowed as the non-life insurance market became saturated. Due to competition the number of non-life insurance companies decreased in 1999, mainly as a result of mergers and take-overs. Currently, companies with non-resident majority stakeholders control over 82% of the non-life insurance market, in life insurance directly foreign-owned companies have 23% and foreign owned banks' subsidiaries 72% share of the market.

Table 5. Selected indicators of the insurance market

	1996	1997	1998	1999	2000	June 2001
Gross collected premiums (EUR m)	53	70	81	83	98	105
o/w non-life insurance (%)	92%	88%	84%	84%	80%	78%
o/w life insurance (%)	8%	12%	16%	16%	20%	22%
Gross collected premiums to GDP (%)	1.57%	1.72%	1.73%	1.71%	1.79%	1.83%
Number of insurance companies	23	23	23	22	13	13
o/w non-life insurance	17	16	16	14	7	7
o/w life insurance	7	8	8	10	6	6
o/w insurers with foreign capital	9	12	9	11	9	9

The key problem with the insurance sector has been that companies are small and their operating costs are relatively high. In addition, some companies had to absorb the losses of bankrupt firms they had taken over in 1999. Therefore, the major challenge for the insurers is to increase business and reduce their cost levels. Since 2000, most of insurance companies have become profitable.

The present regulatory and supervisory structure of the insurance market is based on two principal authorities: The Ministry of Finance which grants and revokes licences of insurance market participants and the Estonian Insurance Supervisory Authority which is responsible for supervising insurance companies which have been granted a licence. From January 2002, the Insurance Supervisory Authority will become a part of the unified Financial Supervision Authority.

1.4.2. Investment Funds

Investment funds began to develop relatively late, in 1996. Domestic money market and capital growth funds became most popular. However, after the decline in stock prices during the Asian and Russian crises, investment funds shrank, and the historically high share of investment funds invested into stock market diminished and has remained at a modest level since. In 1999, investment funds assets demonstrated some revival. During last year, investment funds have experienced a rapid growth, partly because money market and interest funds attracted companies' attention as an alternative short-term investment facility for bank deposits.

Table 6. Selected indicators of investment funds³

	1996	1997	1998	1999	2000	June 2001
Investment funds' assets (EUR m)	31	97	23	76	98	148
o/w money market funds (%)	22%	45%	79%	79%	75%	72%
o/w interest rates funds (%)	1%	0%	5%	14%	17%	21%
o/w stock and index funds (%)	78%	55%	16%	7%	7%	7%
o/w pension funds (%)	-	-	-	0%	1%	1%
Investment funds' assets to GDP (%)	0.92%	2.36%	0.50%	1.50%	1.73%	2.48%
Number of investment funds	12	23	13	14	16	17
Number of asset management companies	6	10	7	5	6	6

The investment funds market should benefit from the evolution of the pension reform, which should encourage long-term savings and investment in pension funds. The present regulatory and supervisory structure of investment funds and asset management firms is based on two principal authorities: the Ministry of Finance, which grants and revokes licences for investment funds, and the Securities Inspectorate, which is responsible for supervising investment funds, which have been granted licences.

1.5. Settlement and Payments Systems

1.5.1. Interbank Settlement System

From the introduction of interbank clearing and settlement system in 1992, Eesti Pank has been the operator and owner of that system. The system has a central clearing and settlement body, the Clearing Division of Eesti Pank. Estonian interbank payment system is based on end-of-day gross settlement. All payments, both large value and retail payments, are cleared and settled through this single system. In the clearing and settlement process, large value payments have higher priority than retail payments. Seven credit institutions (including a foreign bank branch) and the Estonian Central Depository for Securities have opened settlement accounts at Eesti Pank and are considered direct members of the clearing and settlement system.

To improve the settlement system, Eesti Pank plans to implement a new interbank payment system that would be fully compliant with EU requirements. This payment system would be based on two subsystems: a real-time gross settlement (RTGS) system for processing large-value and urgent interbank payments, and a designated-time net settlement (DNS) system for processing retail payments. The objective of the new payment and settlement system is to improve efficiency of settlement of interbank payments. Efficient payment and settlement system ensures readiness of Estonia, after joining EU, for settlement of large-value payments via trans-European gross-settlement system (TARGET). According to the latest plan of Eesti Pank, the new system will be operational by the end of the year 2001.

Operation of the settlement system is regulated by the Credit Institutions Act and the regulations of Eesti Pank. The legal basis regulating the payment and settlement system will correspond fully to the EU acquis after the implementation of regulations based on the

³ However, resident investment funds offer investing also into international investment funds and companies' stocks, which means that the total resident investment into investment funds and stocks is actually higher.

Contracts and Non-Contractual Liabilities Act passed in September 2001. When the DNS system becomes operational, an independent body will settle out-of-court complaints between the system's managers and system's participants. According to current plans, the same independent body will settle out-of-court complaints between credit institutions and their clients.

1.5.2. Payment Instruments

Table 7. Selected indicators of the payment system

	1997	1998	1999	2000
Payments (turnover, EUR m)	20,696	71,688	67,475	80,466
o/w cash payments (%)	14%	6%	4%	2%
o/w non-cash payments (%)	86%	94%	96%	98%
o/w cheques (%)	0.05%	0.03%	0.02%	0.03%
o/w card payments (%)	8%	16%	25%	30%
o/w direct debit (%)	0%	1%	3%	7%
o/w credit orders (%)	78%	78%	68%	62%
o/w paper-based credit orders (%)	56%	33%	19%	11%
o/w telephone and telebank credit orders (%)	41%	57%	60%	58%
o/w Internet bank credit orders (%)	1%	8%	18%	28%
Number of bank cards issued	607,400	697,600	770,000	858,400
o/w credit cards (%)	2.47%	2.75%	2.66%	5.04%
Number of bank cards to population (%)	42%	48%	54%	60%
Number of ATM's	427	490	591	630
Number of POS's	2,153	2,586	3,267	4,084

During the period from 1992 to 1994, companies used mainly non-cash payment instruments. In 1994, a rapid evolution of debit and credit cards began and installation of ATMs started, which made the use of non-cash payment instruments convenient also for households. In the beginning the largest share of the turnover of ATMs (95%) was made up by cash withdrawals, but as the amount of business enterprises accepting debit and credit cards as payment instruments increased over time, the share of cash withdrawals came down.

In 2000, the most popular non-cash payment instruments were credit orders, but instead of visiting the bank and using paper-based credit orders, customers are increasingly using electronic instruments due to lower cost and convenience. **Private individuals and small enterprises use more telephone and Internet banking, whereas larger companies prefer specific products of telebanking.** The expansion of Internet banking began already in 1997 and by June 2001, banks had 360 000 Internet banking clients.⁴ Bank clients have also rapidly got accustomed to debit orders that were introduced by banks in 1996.

⁴ Estonia has 1.4 million inhabitants.

2. Financial Flows and Financial Intermediation

2.1. The Evolution and Structure of Foreign Capital Flows: Impact on the Financial Sector

2.1.1. Foreign Investment

Since the monetary reform in 1992, net inflow of foreign capital into Estonia has been relatively large and played a significant role as alternative for domestic savings in financing the economy. In early 1990s foreign capital inflow took place mostly in the form of direct investments to private sector and to some extent also in the form of long-term government loans. Although other capital inflows have increased by today, the role of FDI has remained crucial. During 1993—2000 the annual average inflow of FDI was 7.8 % of GDP. This share has been stable during several years, as FDI inflow is not only attributable to privatization proceeds but also mostly investments into new and already existing private companies. In nominal terms the amount of FDI inflow has increased year by year, thus those flows are still an important part of Estonian capital flows.

Considering other forms of capital flows, the role of real sector in attracting foreign loan capital directly from abroad has gained more importance during recent years, and it has been an important alternative for local financial market based financing. This has enhanced the capability of enterprises to borrow foreign funds without the intermediation of domestic banks, both from mother companies and from other foreign financial investors⁵. This trend is common for small countries: as the concentration of financial companies and even connected real sector enterprise groups is relatively high, the only way to reduce the risk of concentration on both sides is direct borrowing by the real sector from foreign financial institutions.

In 1996–97 capital inflow into Estonia reflected, to a large extent, active borrowing by banks from international markets and attracted additional funds in the form of syndicated loans and foreign bond issues⁶. On the one hand, this foreign borrowing relaxed the banking sector's dependence on domestic resources; in other words – the banking sector financed the gap between domestic credit and domestic deposits. On the other hand, real sector companies did not have enough creditworthiness to get direct loans at this time.

In the next years, banks concentrated on refinancing their previous liabilities, and the role of banks in attracting additional foreign capital was minimal. Therefore the role of financial sector intermediated foreign capital in financing Estonian economy has diminished. Those trends started in 1998–99 as a consequence of unfavourable external developments. However, those trends were not reversed in 2000 and 2001 when foreign environment recovered. The first reason for this is that during last years domestic saving has been higher. This has reduced the motivation to attract additional long-term foreign resources into the financial sector. Secondly, the continuous inflow of foreign direct investments into Estonian undertakings has improved the ability of the real sector companies to borrow directly from abroad.

⁵ Capital inflow from real sector foreign borrowing has been roughly at the same level (4...5% of GDP).

⁶ For example, foreign liabilities' inflow into banking sector was € 72 million in 1995, € 209 million in 1996 and € 723 million in 1997. At the same time the banking sector intermediated capital outflow into foreign assets increased from € 46 million in 1995 to € 284 million in 1997.

2.1.2. Financial Sector and Foreign Capital Flows

Foreign capital flows of the financial sector are closely connected to liquidity management. The set-up of Estonian Currency Board framework has favoured this development⁷. The evolution of the monetary policy framework together with the small size of domestic financial markets has enhanced the integration of Estonian financial sector with foreign money and capital markets. As a result, the importance of banks' foreign reserves as liquidity buffer has increased and the liquidity management of the banking sector has shifted towards a more active use of banks' foreign reserves since 1996–97. Closer integration with foreign markets, the use of foreign reserves as liquidity buffers and the fixed exchange rate have created the necessary preconditions to allow foreign monetary signals (especially interest rate signals from the anchor currency) to pass more clearly into the domestic financial sector (see Chapter 3).

Additionally, the financial sector capital flows are largely derived from activities in other Baltic countries; this has become more evident since 1999–2000. Those flows are a result of the fact that Estonian financial companies have subsidiaries in other Baltic countries, and some amount of those activities in the Baltic countries is financed through Estonian headquarters. As a consequence, Estonian banking sector has raised foreign capital both in 2000 and 2001 to finance their direct investments into Latvian and Lithuanian banking sector, whereas domestic saving exceeded the granted credit. Moreover, Estonian deposit growth has also been used to fund activities in other Baltic countries, as an opportunity for diversification of investments.

A similar approach has characterized the management of sector foreign assets and foreign liabilities in whole financial sector. On the one hand, Estonian banks have accumulated relatively large amounts of foreign liabilities. At the same time banks use foreign reserves as a major instrument for liquidity management, finance their activities in the Baltic countries, and invest into a large range of foreign assets. **As a result, Estonian banks have considerable gross balances in both foreign assets and foreign liabilities.**

Such differences between gross and net foreign capital flows and balances are typical for all sectors of a small economy such as Estonia. Firstly, taking into account the small size of Estonian financial markets and limited amount of financial instruments available, it is reasonable that when someone wants to diversify one's investments, one needs to include a substantial share of foreign assets in addition to Estonian assets in the portfolio. Secondly, there is a relative advantage for Estonian investors to invest into shares of foreign companies listed on a foreign stock exchange, that have made substantial direct investments into Estonia. This may have caused some capital flows in the opposite direction, where FDI inflow into Estonia is somewhat reversed by portfolio outflows from Estonia. **Therefore it is very difficult to draw the line for domestic financial market.**

2.2. The Role of Financial Sector Intermediation

Summarizing previous Chapters, the main channels for financing economy are the banking sector, international capital flows, and to a lesser extent, the securities market and leasing. **In the structure of debt-creating financing of the real sector, the share of foreign**

⁷ The most important monetary policy instruments are reserve requirements and unlimited and without spread forex exchange facility with euro area currencies. From 2001 the credit institutions can partially fulfil their reserve requirement with a certain type of foreign securities.

financing is approximately 50%; without intra-company loans (ie FDI flows), it is 25%. On the other hand, Estonian companies obtain half of their debt-creating financing from banks and one fourth from other parts of Estonian financial sector. While companies obtain funding from other segments of the domestic financial sector – leasing and securities market, then households' financing is mainly based on bank loans (85% of debts). The financial sector's exposure to households is relatively small, and the indebtedness of households' amounts to only 10% of GDP.

The increase in bank assets has been accompanied by deepening financial intermediation, as funds are collected from the broad public and intermediated via extending the instrument range to numerous clients from different sectors. The prevailing saving instruments and the main channel for financial intermediation to collect the savings in Estonia are bank deposits. Even the banks' total liabilities constitute 61% of GDP, of which approximately 30% are related to non-resident deposits and borrowed funds from foreign financial institutions. Since 1997 banks have been very active in borrowing from international markets. These liabilities exceeded 30% of total liabilities between 1997 and 1999. However, the share of this kind of financing has been diminishing and the share of syndicated loans and foreign bond issues represent approximately one fourth of liabilities in 2001.

Five years ago, the origin of bank deposits was divided into three equal groups: households, companies and others. During last years the rapid growth of household deposits turned the households into the most important source of funding for banks. By the end of June 2001, household deposits exceeded 25% of total liabilities, and the share of corporate deposits declined below 20%.

Due to the banks' conservative approach and a high rate of reserve requirement, approximately 30% of assets are invested in liquid instruments in the central bank and abroad. Due to foreign borrowing, the banks' external liabilities exceed external assets. Nevertheless, the difference between the banks' foreign liabilities and assets is very small and those balances have been largely countervailing since 2000. **In other words, funds mediated by banks between residential groups are also balanced.** Approximately 60% of bank assets are invested into domestic real sector, of which one third via leasing subsidiaries. It means roughly speaking that Estonian real sector and government deposits are intermediated to residents: companies (68%), households (27%) and public sector (5%). When domestic liabilities are mainly short term and assets long term, and on the other hand, the structure of foreign assets and liabilities is the opposite, using foreign funds and investments helps to reduce the maturity mismatch of the banks' assets and liabilities.

As previously described, leasing companies have become an important credit channel for banks and mainly for lending to enterprises. Changes in domestic savings and deposit growth have led to an important structural shift of funding leasing companies. Between 1997–1999, leasing companies received additional funding from the international market via syndicated loans and bond issues. During last years, leasing has been fully financed by parent banks.

Table 8. Main bank assets and liabilities and leasing company assets to GDP

	1996	1997	1998	1999	2000	June 2001
Banks' claims						
Claims on enterprises	15%	19%	18%	17%	17%	17%
Claims on financial companies	5%	5%	6%	8%	12%	14%
Claims on households	3%	6%	6%	7%	8%	8%
Claims on non-residents	7%	12%	9%	11%	2%	17%
Banks' liabilities						
Liabilities on enterprises	9%	11%	10%	12%	13%	14%
Liabilities on financial companies	8%	11%	11%	13%	16%	18%
Liabilities on households	5%	5%	3%	2%	3%	4%
Liabilities on non-residents	8%	20%	16%	18%	19%	20%
Leasing claims						
Liabilities on enterprises			10%	10%	12%	12%
Liabilities on households			1%	1%	2%	3%

Despite the fact that financial sector is bank-dominated in the institutional sense, an important role in the intermediation of financial flows between different economic sectors also belongs to the securities market in Estonia. Especially in the early 1990s, banks played a more dominant role in financing local companies. Since 1996 the securities market has become an important channel for accumulating capital, first of all for those branches of the economy, which have a more dynamic structure of capital (financial companies) or relatively low credit risk (local governments and big companies).

However, the share of financing by debt securities has been modest with outstanding debt securities issued by local companies making up less than 3% of GDP and less than 10% of all securities market' flows. As Estonian government budget has been roughly in balance, there has been no need for government securities. Therefore, domestic real sector companies have been the main issuers after foreign banks in local debt securities market. Additionally, some companies use international markets as an alternative place for issuing bonds and several Estonian investors have bought these instruments. This makes it very difficult to measure domestic market.

Table 9. The structure of Estonian financial sector intermediated claims on residential companies by financial markets

	1997	1998	1999	2000
Banking	91%	43%	50%	43%
Leasing	5%	9%	17%	21%
Stock market	2%	45%	26%	33%
Debt securities	2%	3%	7%	3%

In an open economy context, the role of foreign investors in the securities market is important. The total value of Estonian companies' outstanding debt securities and tradable stocks are approximately 40% to GDP, of which more than 65% are based on foreign financing. By the international investment position the investment of non-residents into the Estonian capital market exceeds investment of Estonian residents into foreign securities.

In a financial sector based on the universal banking model, the most important source of financing for the real sector is bank lending. During last five years, the credit exposure of the banks and their leasing subsidiaries to Estonian real sector enterprises and households has increased from 25% of GDP to 40%⁸; this illustrates the progress of financial deepening. **During the period of relatively high concentration in the banking sector (since 1999), net interest margins have been declining, and enterprises have used more actively the option of getting funding from abroad in the form of FDI or loans. This has placed Estonian financial sector into a more competitive environment.**

Box 1: Financial Deepening – Evidence of Convergence

Financial deepening in broader terms can be characterized by the dynamics of the position of the real sector against consolidated financial sector and in terms of expanding of financial markets. The process of financial deepening in Estonia has been dependent on foreign capital inflows and movements of price level and income. One way to measure the process of deepening of financial intermediation is to measure the increase in broader money aggregates, but also the increase in the volume and liquidity of the securities market.

In early 1990s, the level of financial deepening was relatively low, and the ratio of banks' assets to GDP less than 40%. Those assets were financed by funds deposited in banks, which were mainly established in early 1990s. During the transition period, Estonia has experienced several banking crises, wherein most of the former state-owned banks went bankrupt or were liquidated. Therefore, funds deposited in the banks are based on new savings, and the share of claims from the planning economy period has been relatively low. During this period, the process of financial deepening was mainly supported by the convergence of Estonian price level, which was mainly related to the relative price adjustment.

The turning point for the process was the end of 1996, when the banks' loan portfolio started to grow rapidly and the ratio of banks' assets to GDP exceeded 60%. In the first stage the acceleration was supported by the banks' foreign borrowing and in the next stage it was followed by domestic deposit growth. In 1997, the growth rates of real GDP and nominal wage were 10.4% and 19.7% respectively, which reflected a more rapid convergence process. At the same time, the convergence of the income level became more important.

Also in 1996 the securities market became an important channel for drawing capital for companies and securities market instruments started to play an important role in obtaining financial resources. Due to the increased number of traded securities and a very rapid growth of the stock exchange index, the stock market capitalization rose to over 50% of GDP. In the first phase, the rapid growth rate of the stock prices reflects the convergence of the value of enterprises. The initial under-valuation of enterprises was illustrated by the fact that the stocks of traded companies entered the market mainly on the book value until 1996.

⁸ The ratio of banks' loan portfolio to GDP is 58% in Finland (2000), and on average, approximately 100% in EU.

Immediately after the Asian and Russian crises, the process of financial deepening was modest. The growth rate of financial assets was at the same level as the growth of nominal GDP, and for securities market it was even negative reflecting the decline in stock prices. During the last two years, the growth rate of financial assets has exceeded nominal GDP growth, and financial deepening has continued. This process has been led by relatively rapid deposit growth and subsequent loan portfolio growth. Bank assets exceeded 71.5% of GDP in the end of June 2001⁹. In early 1990s financial deepening was more dependent on the convergence of price level, but during the last four years the convergence of income level has played a leading role and the convergence of price level has followed it.

3. Monetary Transmission Process in Estonia – Empirical Evidence

3.1. Cross-Border Transmission of Interest Rates – the Interbank Money Market

The basic features of Estonian monetary system are (1) fixed exchange rate, (2) absence of traditional monetary policy instruments, and (3) free capital movement. Therefore, the first link in the transmission chain is the link between domestic and foreign money markets.

Estonian money market can be considered an internationalized market: TALIBOR quotations involve three biggest domestic commercial banks and two foreign (Scandinavian) banks. Operational framework encourages commercial banks to manage their liquidity not through domestic money market but rather through European markets. Additionally, the unlimited and free-of-charge forex window offered by the central bank enhances foreign asset based liquidity management.

Analysing domestic commercial banks' short-term (up to three months) claims on credit institutions, it can be found that around 90% of transactions are contracted with non-residents¹⁰. A relatively similar but more volatile pattern is observable on commercial banks' short-term liabilities side; the share of non-residents' counterparts in short-term money market transactions has fluctuated between 97% and 60% over the last two years (see Figure 12 and 13 in Statistical Appendix).

3.1.1. Short Term Rates

Considering spreads between domestic and foreign (three-month) money market quotations, one can observe a clear decline over longer time horizon¹¹. Unfortunately, shocks from the years 1997 and 1998 significantly distort this process. In spite of the shock periods, it is possible to identify a steady long-run decline in the spreads. The average monthly decline in the spread has been around seven basis points (or 83 bp per year, using the simplest linear trend) (see Figure 2). Even if the money market spreads diverge significantly from this oversimplified trend over the shock periods, effective spread measure gives some support to calculated trend-line.¹²

⁹ The ratio of the banks' total assets to GDP is 102% in Finland (2000), and on average, approximately 200% in EU.

¹⁰ In 2000, the average share of non-residents was 88.6 %. Over the first seven months of 2001, the same figure was 93.3%.

¹¹ Quotations on Estonian money market (TALIBOR rates) started in the beginning of 1996.

¹² This rate is subject to relatively high fluctuations as the number of commercial banks on the market is low and the group of banks borrowing in every time-period is not homogenous.

In terms of effectiveness and convergence between domestic and foreign money market rates through existing arbitrage opportunities between those markets, arbitrage opportunities have been almost removed for domestic commercial banks since the summer of 2000. After August 2000 there is no significant spread between Estonian commercial banks three-month bid rate (both quoted and effective) and European interbank offer rate. Higher domestic offer quotations (most of times 1 pp above bid) reflect the shallowness of the domestic market. This converging development also assures that all movements on foreign money market are transmitted directly into domestic money market. **Further convergence of the spreads between domestic and foreign offer rates** depends on the competitiveness on domestic money market.

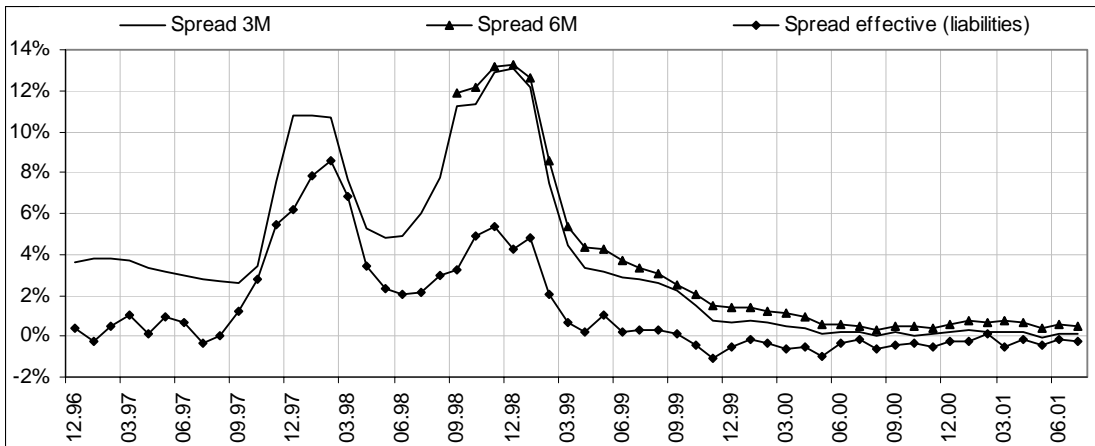


Figure 2. Estonian kroon money market rates spread with euro money market rate (between Estonian bid and European offer rate).

Before the middle of 2000, distinguishing between decline in spread, transmission of foreign money market rates and money market shocks is more complicated. Even assuming long run spread decline process, elimination of the shocks remains still impossible, as shocks' amplitude was in times bigger than maximum impulses coming from foreign money market. One-to-one transmission of European money market rates and further decline in the spreads between domestic bid and offer rates on money market can be expected in the future.

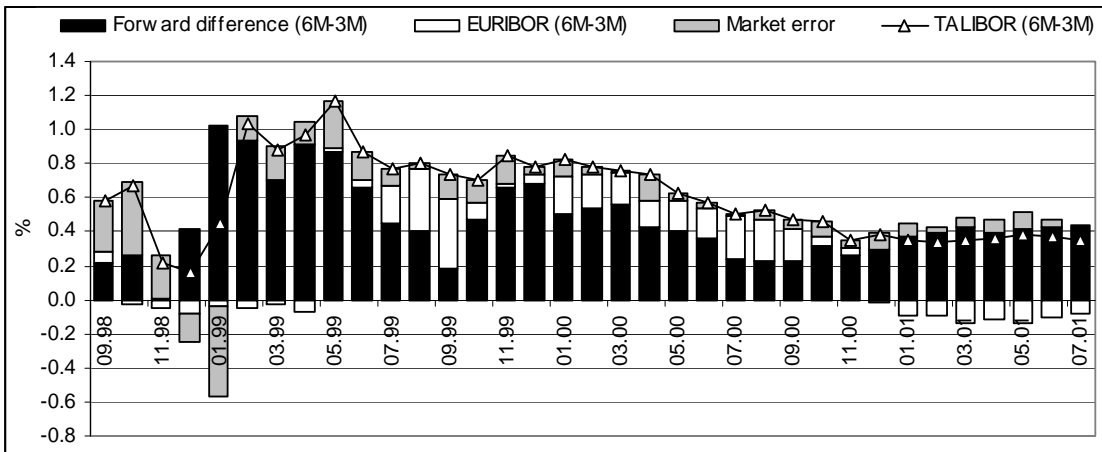


Figure 3. Structure of 3 and 6 months TALIBOR differences.

3.1.2. Longer Rates – the Issue of Yield Curve

Technically the domestic money market yield curve consists of the European yield curve and the Estonian kroon's forward points' differential (see Figure 3), reflecting prevailing risk premium between Estonia and the euro area. Low difference between technical calculations and actual quotations supports effectiveness of domestic money market quotations¹³. This technical error measure has steadily declined with the wane of the Russian crisis' influences and has been relatively stable after the second half of 1999. **From these developments it can be concluded that at times when there are no pressures on the foreign exchange forward market, domestic money market yield curve mimics the European one quite closely.**

3.2. Transmission of Impulses into Retail Rates

The critical question in Estonian transmission process lies in the role of domestic and foreign money markets. If money markets were used only/mostly for liquidity management, then interest rate developments on these markets would not necessarily transmit into domestic retail rates. But if these markets are also used to acquire new finances to finance banks' assets, developments on these markets should transmit into retail rates more directly.

For an indirect test of the role of the domestic money market, prices paid on domestic deposits and on foreign financing could be compared – ie how much does the price of different liabilities differ? **If rates move together, then financing through foreign money markets and the use of domestic deposits can be treated as close substitutes, and transmission from effective rates should be significant.** And if it were possible to find a direct connection between the domestic effective money market rate and foreign money market rate, direct transmission channel through money market into retail rates would exist.

In Estonian case there is clear evidence about close co-movements between effective money market rate and the interest rate on domestic deposits with maturity up to three months, denominated in the kroon and fixed to the euro and the euro component currencies (see Figure 4). This founding supports the hypothesis of close substitutability between domestic deposits and financing through both foreign and domestic money markets¹⁴, making domestic deposit rates heavily dependent on foreign rates and on monetary shocks (which make the effective money market rate diverge from its convergence path).

¹³ Reliable effective yield curves cannot be calculated as turnover in maturities over three months is very rare and homogeneity problem would arise more drastically.

¹⁴ Observed correlation between the rates is even slightly higher, if only kroon nominated liabilities are studied.

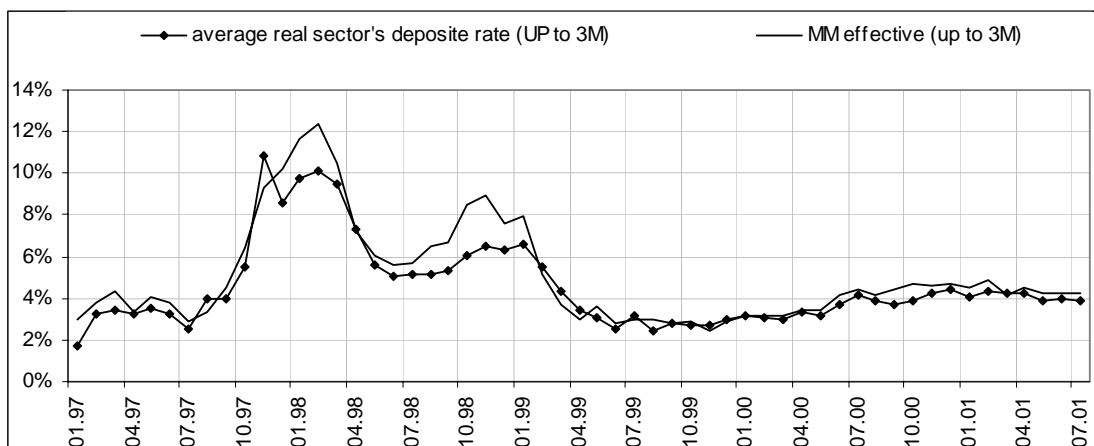


Figure 4. Effective money market rate and domestic deposit rate.

To explain the developments in the deposit rate, a common line with prices of tradable goods can also be drawn – in both cases Estonian economy is in the role of the price-taker and domestic prices adjust according to the developments abroad. Short-term fluctuations can occur, but in the longer term exaggerated arbitrage will remove differences.

Distinguishing transmission of foreign monetary policy action and monetary shocks onto Estonian lending rates is more complicated. This holds despite the previous analysis, which supported the hypothesis that most of the monetary signals are transmitted into commercial banks' liabilities.

After the latest bigger external shock in 1998, all lending rates started to decline due to the reduction in the spreads (see Figure 5). The sharp decline in Estonian lending rates stopped in the beginning of 2000. It is exactly the same time when European money market rates started to increase. Over that increase period most of the Estonian retail lending rates remained stable, making domestic spreads fall at the same rate as before. Only the key lending rate, which demonstrated a slight upward movement, reflected the price of long-term loans to households.

These possible simultaneous developments in the lending rate factors (both in the base rate¹⁵ and the spread) make evaluating of existence and/or strength of the transmission process into lending rates difficult and speculative. But it is likely that over European money market rates' growth cycle, the simultaneous decline in the spreads cancelled off most of the increases in the base rate. This hypothesis could be supported by the fact that the decline in the calculated spreads did not speed up over periods of increase in the base rate and it even kept its slightly decelerating decline ($\Delta^2 spread < 0$)¹⁶.

¹⁵ A reference to EURIBOR.

¹⁶ Additionally, if we would assume that in this period an increase in foreign money market rates should be observable through increases in Estonian lending rates, then purely mathematically calculated spread should increase instead of continuing to decline, as is the case currently.

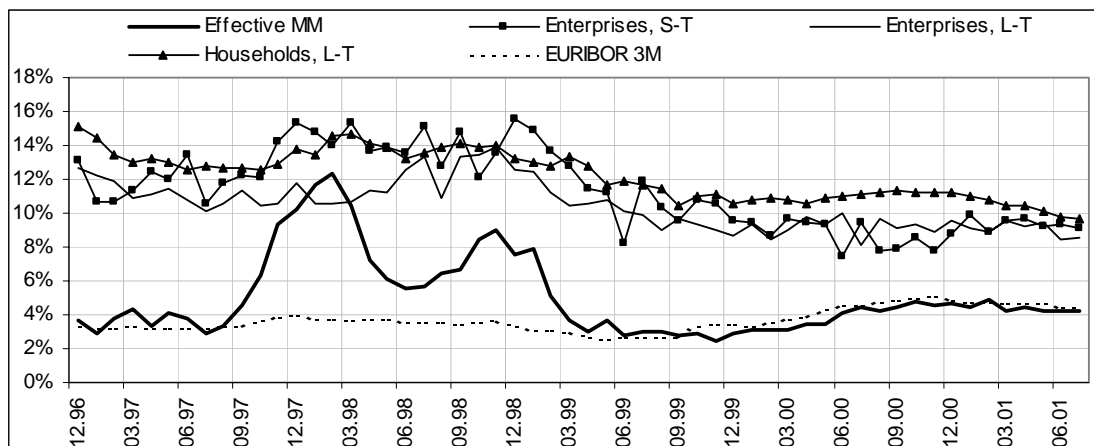


Figure 5. Effective money market rate and banks' lending rate (S-T: short term, L-T: long term)

The only interest rate that reflected the increase in European money market rates was the one of long-term credit to households (still, with much smaller amplitude than the increase in the base rate). This credit aggregate consists mostly of mortgages and the slope of its price spread over European money market rates has been lower than other rates over the entire after-shock period. This finding supports the conclusion that actually European money market rates transmitted fully into the entire spectrum of Estonian interest rates, but the simultaneous decline in the spreads has overshadowed its direct effect on interest rates in some cases. This conclusion of the developments in domestic lending rates supports the assumption of direct ongoing convergence between Estonian and European retail rates (see Figures 15-17 in Statistical Appendix).¹⁷

3.3. Impacts on Real Activity and Inflation

The influence stemming from relatively small changes in the base interest rate on Estonian economy is hardly distinguishable. To list some of the transitory processes influencing this process directly or indirectly, nominal and real convergence and financial sector restructuring should be mentioned.

For example, real convergence causes the situation where credit demand curve is in constant move as more and more households and enterprises cross the line of "creditworthiness". Also, in part because of the fixed exchange rate, fluctuations abroad can amplify the volatility of Estonian inflation. That in turn will export higher uncertainty into inflation expectations making real *ex-ante* interest rate harder to estimate. This process magnifies the "normal" inflation differential caused by price convergence path (which has been estimated to be currently in the range between two and three percentage points), and this makes inflation component in real interest rates more important.

The increasing importance of direct foreign financing and leasing financing is currently the most important factor coming from financial sector restructuring that influence the monetary transmission process (see Figure 14 in Statistical Appendix). Direct foreign

¹⁷ The compared groups of clients are not fully comparable.

financing, more prominent in the financing of the tradable and export oriented sectors, lowers the banks' ability to dictate lending rates for this sector.

One way to analyse monetary transmission into the real sector is to analyse credit spreads¹⁸ in different economic sectors and sectors' reactions to changes in the shape of the credit curve¹⁹. Some evidence about a positive relationship between the sector's credit spread and future economic activity of the sector has been found. This could partly be explained by the fact that changes in short-term lending rates are influenced by the prevailing liquidity conditions. Deteriorating liquidity conditions (like in the case of credible tightening scenario) drive the short end of the credit curve up (both in nominal and real terms) while having little effect on longer rates, thus creating a negative link between flattening of the term structure and future growth. This relationship has been found to be stronger in the non-tradable sector, where the share of direct foreign financing is lower.

In addition to the analysis of the impacts of the credit curve, the complete monetary transmission process has been studied using an empirical model at Eesti Pank. According to the estimated model, it was possible to distinguish between the long-term decline in the domestic spread (as a function of economic fundamentals) and impacts coming from base interest rate changes. Transmission of monetary signals (both changes in the ECB official rate and monetary shocks) into retail rates was found to be relatively fast and the full effect was achieved with a lag of less than three months. Also it was possible to separate and specify the credit channel as a channel with a relatively high impact on real economic activity over the shock periods.

Box 2: Determination of the Yield Curve in the Absence of Government Securities Market

Partly due to restrictions imposed by the currency board, but even more due to successful economic reforms, Estonian fiscal deficits and government lending over the last ten years have remained modest by European standards. Estonian recent Economic Program Prior to Accession (PEP) also foresees that the government budget remains in balance over the medium term, as exceptional deficits are allowed to emerge only due to pension reform costs.

The general economic policy has lent support to continuation of conservative government borrowing policy. An additional supportive factor has been the strong financial sector, which has assumed an important role also in financing infrastructure projects. Given this background the government securities market is likely to stay thin.

Absence of long-term government securities market means that there is no "classical" benchmark yield curve in Estonia. However, there are a number of alternative ways to derive the cost of Estonian kroon funds in the Estonian financial market. One possibility for the construction of the Estonian kroon yield curve is to use money market instruments up to one-year segment, and euro interest rates adjusted for forward premium of Estonian kroon and corporate bonds for the longer maturities. Foreign exchange markets in Estonia

¹⁸ Credit spread could be defined as the relation between long-term (over five years) and shorter-term (one to two years) lending rates.

¹⁹ Aggregated credit figures are not very reliable, because in the process of economic and financial restructuring the banks' client structure and average maturity of loans are not homogenous over time.

are relatively deep compared to other markets and daily price quotations for funds up to three years are available.

Given the key role of the financial sector in financial intermediation, a representative yield curve (or credit curve) can be derived from bank lending rates. Empirical analysis shows that Estonian credit curve dynamics (eg changes in the spread of longer and short-term rates) particularly on the sectoral level include some information about *ex ante* developments in the real sector. However, interpretation of credit curve signals is somewhat complicated as shifts in the credit curve are subject to a variety of demand- and supply-related factors. Among supply-related factors there are changes in risk assessments, cost of funds, competition, etc.

A general observation is that short-term lending rates are prone to shifts in the general liquidity stance, if compared to the longer-term rates. Short-term lending rates react more quickly to domestic or external shocks and have historically followed money market rates relatively closely. Longer-term rates on the other hand show cost of funds for investment goods and more than the three percentage point shift downwards in the latter during the past three years depicts the on-going large scale structural shifts in the economy.

4. Safeguarding Financial Stability

4.1. Banking Sector Supervision

4.1.1. Current Organizational Structure

Banking supervision in Estonia has been developing together with the banking sector and, as a result of a rapid consolidation process over the recent years, has achieved remarkable international competitiveness. Rapid development and dynamism of the financial sector are the key words for banking supervision in Estonia today. Ever deepening integration of financial markets, rapid technological development of banks and introduction of new financial instruments involve new risks as well as new challenges for banking supervision.

Currently, financial supervision in Estonia is carried out by three institutions. The Banking Supervision Department (BSD) of Eesti Pank performs the supervision of credit institutions. Supervision of insurance sector is undertaken by the Insurance Supervisory Authority as a financially independent organization under jurisdiction of the Ministry of Finance. The securities market is supervised by the Securities Inspectorate under the jurisdiction of the Ministry of Finance.

The BSD has three divisions. Off-site Supervision Division is responsible for the financial analysis of credit institutions, monitoring of reporting and prudential rules, and drafting new regulations. On-site Supervision Department is responsible for on-site inspections targeting all risk categories. Banking Supervision Department is responsible for the analysis and drafting of the regulatory basis for banking.

The rights of the BSD to exercise supervision of credit institutions and their consolidated groups are provided for in the Credit Institutions Act (CIA) enforced on 1 July 1999. The new draft act was elaborated due to significant changes in the legal system of Estonia, rapid development of the financial sector as well as the need to improve the legal base of

banking supervision. The CIA was based on EU banking directives, the experience of many other countries, documents of the Basle Committee on Banking Supervision and recommendations of foreign experts.

4.1.2. New Aspects in Banking Supervision

The principles for consolidated financial statements of credit institutions were introduced already in 1996. More comprehensive regulations for compiling consolidated statements were set up in 1998. The new CIA enforced from July 1999 stipulated prudential ratios for credit institutions such as capital adequacy, large exposures and investments on solo as well as consolidated basis. In 2000 a working group was set up to improve credit institutions' capital adequacy and large exposures current framework, comparing it to EU directives, core principles of the Basle Committee on Banking Supervision and guidelines of other countries, primarily the UK, Finland, the Netherlands and Latvia. New regulations will be implemented in the beginning of 2002.

In 2000 **Public Disclosure Reports of Credit Institutions** established minimum requirements for credit institutions to disclose their management, risk profile, economic activity and condition. This procedure is based on recommendations of the Basle Committee of Credit Institutions. The unified disclosure requirements should enhance market transparency, credibility and discipline, and also clarify the role of the bank managers in risk management as the personal liability for the correctness of the information has been publicly declared.

In the first half of 2001, the International Monetary Fund (IMF) and the World Bank (WB) conducted a Financial Sector Assessment Program in Estonia. In the course of the programme, Banking Supervision Department's activities with respect to 25 Basle Core Principles for Effective Banking Supervision were analysed in depth. The main findings of the report were that the legal and regulatory framework of the Banking Supervision Department as well as its administrative capacity has been considerably strengthened. The assessment pointed out that the banking supervision framework is insufficient only in providing legal protection to supervision staff. The passing of the State Liability Act in spring 2001 solved this problem. The report also outlined the following priorities: to establish regulations on loan classifications and loan provisions as well as to formalize relations with supervision authorities in other countries. Last year displayed significant progress in both fields.²⁰

A similar assessment was conducted by a team of experts from EU supervisory organizations in the area of financial services in the first half of 2001. The findings of this peer review of effective financial services in 2000 were similar to the ones of the Financial Sector Assessment Program. **Both assessments found that banking supervision has been further strengthened. Among other things, the peer review concluded that the Estonian crisis management policy has the necessary legal framework and a comprehensive set of tools.**

²⁰ The Decree of the Governor of Eesti Pank established Servicing of Loans of Credit Institutions and Entering of Uncollectible Claims in Expenses. The Banking Supervision Department signed a Memorandum of Understanding (MoU) with Latvian and Lithuanian Supervisory Authorities and also renewed it with Finnish Supervisory Authority in 2000. Currently, signing the MoU with Swedish Supervisory Authority is in final stages and in process with Russia and Germany.

4.2. Building a New Supervision Agency

The unification of three financial sector supervisory authorities – the Banking Supervision Department of Eesti Pank, Securities Inspectorate and Insurance Supervisory Agency – into a single Estonian Financial Supervision Authority (EFSA) is based on the Financial Supervisory Authority Act and amendments to other acts governing present supervisory authorities that were adopted on May 9, 2001. The EFSA will be operational from 2002. According to the Financial Supervisory Authority Act, the EFSA is an independent institution affiliated with Eesti Pank.

The independence of the EFSA is supported by its organizational structure. The governing bodies of the EFSA – the Supervisory Board and the Management Board – are not part of the central bank governance hierarchy. According to the Act, the EFSA has its own budget formed on the basis of supervisory fees collected from market participants. When exercising its control functions, designing financial regulations and making decisions regarding market participants, the EFSA is unconditionally independent from any other institution.

The EFSA is administratively affiliated with Eesti Pank and is located in the same complex of buildings. The EFSA will use several services rendered by Eesti Pank (information technology, building maintenance, etc), as it notably cuts down the expenses of the EFSA and avoids duplication of tasks.

After commencing its operations the EFSA will formalize co-operation with Eesti Pank and the Ministry of Finance in fields of crisis management, development of financial sector legislation and information sharing.

The main rationale for the unification lies in the central role of financial conglomerates in the financial market. Although the universal banking model is clearly prevalent in Estonia, requiring efficient co-operation between the supervisory authorities, the actual situation indicated several weaknesses in inter-agency communication. Secondly, shortcomings in the quality and coverage of the mushrooming non-bank financial sector supervision necessitated steps for reorganization.

4.3. Financial Sector Safety Net Issues

4.3.1. Currency Board Arrangement (CBA) and the Lender-of-Last-Resort (LLR) Function

Under CBA, the scope of LLR support is limited to the amount of foreign reserves in excess of that required for backing currency in circulation (ie to excess currency board cover). In general, the greater the excess coverage, the greater the credibility of a monetary system. Currently the excess coverage is over 140 millions of euro, or about 20% of the base money and six per cent of the broad money. **Under present circumstances, the absence of LLR framework is not a weakness in the system. On the contrary, it actually enhances the credibility of the CBA as well as provides the appropriate incentives to banks.**

In addition to their cash and liquid interbank deposits, banks have maintained a sizeable liquidity buffer through investments in foreign treasury bills and bonds, which has allowed

banks to cover over 80% of their liquid liabilities. This kind of conservatism reduces moral hazard and reflects largely the lessons learned during the two attacks on the kroon when Eesti Pank firmly adhered to the strict rules imposed by the CBA including the absence of LLR facilities. A related issue is the fact that the presence of foreign strategic investors in the big banks reduces the need to have explicit operational rules for LLR operations. However, the role of foreign shareholders should not be overestimated. Accumulated liquidity buffers are more valuable considering domestic lending activities.

Notwithstanding the absence of formal framework, Eesti Pank has been at times actively involved in resolution of financial instability incidents, providing liquidity support or participating in re-capitalization. **These actions of the central bank have occurred on a case-by-case basis, with the aim to avoid spreading the problems of an individual bank system-wide. These episodes did not have a discernible impact to excess reserves of the central bank.** The availability of emergency credit from the central bank could certainly ease solving liquidity problems of an individual bank and even avoid systemic liquidity crises, but it would at the same time encourage banks to take higher risks. The history of Estonian banking system allows one to conclude that a stable currency and presence of general financial safety net can compensate the absence of classical LLR facility and ensure development of effective and reliable banking sector.

4.3.2. Operational Framework

Institutional arrangements, operational procedures and monetary and prudential instruments can be designed to reduce the risk of a systemic liquidity crisis while limiting discretionary interference from the monetary authorities. A rule-based monetary system such as currency board puts major emphasis on the smooth operation of the operational framework and non-discretionary instruments. Thus, the objective of the liquidity management in the system is to anticipate and avoid any potential need for liquidity support by central bank means. All improvements in the liquidity system should be done considering the integrity and smooth operation of the system.

Under CBA, the reserve requirement system should create sufficient liquidity buffers for commercial banks that substitute for the limitations of the LLR facility and the lack of other monetary policy facilities. By using the reserve requirement, automatic access to central bank liquidity can be facilitated. **As the reserve requirement has to be met on a monthly averaged basis, it can be considered an automatic source of kroon liquidity for banks.**

Compared to other transition countries, the ratio of required reserves in Estonia is relatively high (13%). In addition to large liquidity buffers built up in that framework, the reserve requirement is in a sense partly able to substitute for the LLR facility by partly fulfilling the requirement or reducing the rate of requirement under discretion of the central bank. In that case, the penalty rate for not fulfilling the reserve requirement functions largely like a central bank lending rate. However, a sophisticated system of required reserves does not fully replace a lending facility, because these funds are a part of the banks' assets.

The scarcity of eligible assets for backing central bank lending activities is one of the most often mentioned barriers for developing an LLR instrument under CBA. In Estonia, the reform of required reserves has involved building up reserves of eligible assets (at least

AA rating euro-denominated papers). Today, the option to meet reserve requirements with eligible foreign assets (up to 50% of the requirement) helps banks to improve their liquidity management. The prominent role of the reform of the reserve requirement system was to promote integration into European and world financial markets that is a prerequisite for smooth functioning of the CBA.

Considering the fact that the required reserves provide a buffer for the settlement system, Eesti Pank offers the credit institutions an option to use foreign assets in domestic liquidity management with T+1 settlement (in special cases with T+0). However, using the facility indicates problems in the liquidity management of an individual bank. Therefore, particularly the danger of damaging credibility among market participants discourages using that option.

The design of a collateralized lending facility based on these eligible assets is an issue for modifying the operational framework. This objective is more forward-looking and related to issues of operational convergence with the Eurosystem.

4.3.3. Crisis Prevention

Limiting money supply to net foreign assets of the central bank limits the room for emergency liquidity support. Therefore, a private sector solution is preferable and particular modalities of crisis resolution will depend very much on the circumstances. **Crisis resolution is the key in avoiding systemic disturbances**, and the ultimate policy choice for the authorities is to find a balance between the public sector and private sector solutions on the one hand and between a pre-determined schedule and an *ad hoc* approach on the other hand.

However, it is necessary to develop a generally agreed framework for collaboration should it prove necessary to address solvency and liquidity crises in the banking system. At a minimum, this framework should cover the channels of communication between the central bank, the government, and supervision.

Continuous analysis of financial system developments and early warning indicators, the importance of strong owners and sound risk management in banks, high liquidity and capital requirements – these basic principles are a necessity for Estonian authorities. Reporting requirements for banks have been significantly strengthened during last year, keeping in mind the need to have a very good overview of banks' financial and especially liquidity situation. The above-mentioned framework of reserve requirements could be seen as source for short-term liquidity support for the system.

In case of systemic risk, both the government and the central bank will intervene to safeguard the stability of financial system as a whole, as it was in 1998. The government and the central bank have sufficient resources and political will to avoid systemic crises. The crisis resolution actions are based on a three-step approach: winding-up the troubled institution; merger, acquisition or private capital injection; and finally, if necessary, public intervention, which is seen as the least preferred option.

4.3.4. Deposit Insurance

The Estonian deposit insurance scheme, effective from October 1, 1998, established a Deposit Guarantee Fund (DGF), which is based on *ex post* financing. The assets of the Deposit Guarantee Fund are formed from one-off payments made upon the foundation of credit institutions and branches of foreign credit institutions, obligatory contributions by credit institutions, income received from the investment of the assets of the Fund and other incomes.

The amount of an obligatory contribution is decided by the Supervisory Board of the DGF pursuant to the procedure prescribed by the statutes of the Fund. The maximum amount of an obligatory contribution shall be 0.125% of the total amount of deposits taken by a credit institution or an Estonian branch of a foreign credit institution per quarter in the end of the previous quarter.

The Fund satisfies the claims of entitled persons out of the assets of the Fund. If the assets of the Fund are insufficient for the satisfaction of the claims of entitled persons, the Fund shall take a loan or request that the Government of the Republic takes a loan for on-lending to the Fund.

Compensation is restricted to 90% of the value of deposits, including the principal and interest. Current minimum level of compensation is 40,000 kroons (2556 euro) and the board of the DGF has approved the schedule for achieving the EU minimum level of guarantee (20,000 euro) by the end of 2007.

Recent experience shows that the DGF works well. Shortly after the Deposit Guarantee Act became effective, two small banks failed, and the DGF was required to compensate the depositors of both institutions. At that time, its own funds were insufficient to cover these liabilities (8.5 million euro), and the DGF borrowed 4.8 million euro from a domestic bank without serious delays. Two years after the compensation the fund paid back the last stake of borrowed funds.

Statistical Appendix

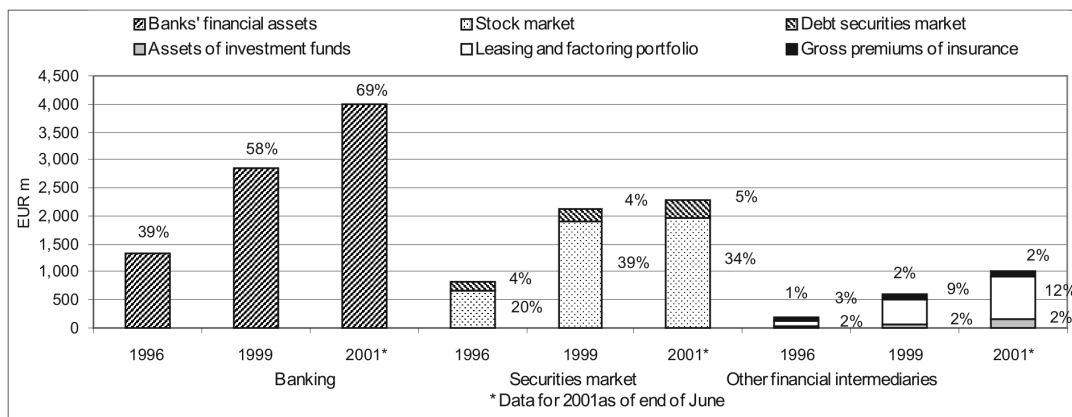


Figure 1a. The structure and volume of financial intermediaries (million EUR and % of GDP)

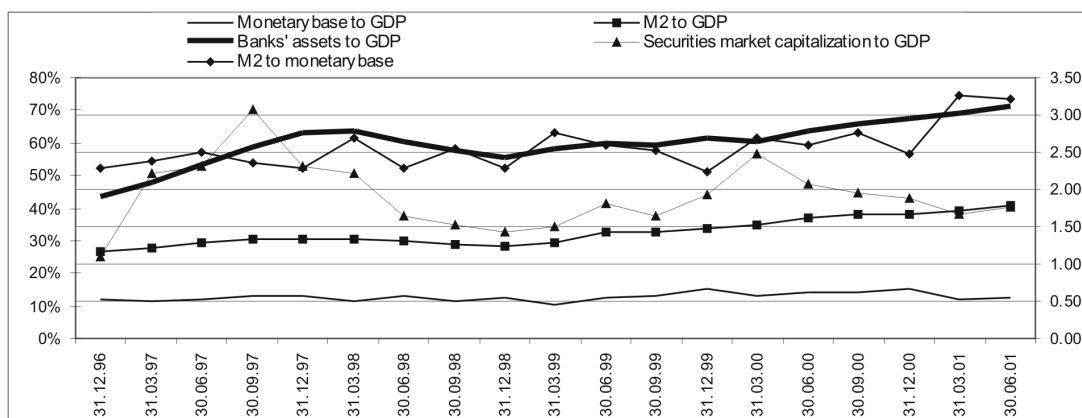


Figure 2a. Financial assets ratios to GDP and money multiplier (M2/monetary base)

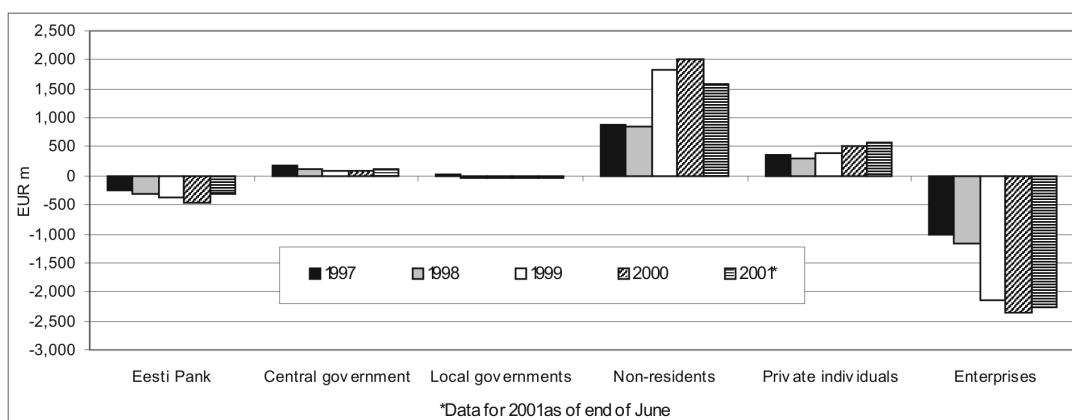


Figure 3a. Net positions of economic sector against financial sector (million EUR)

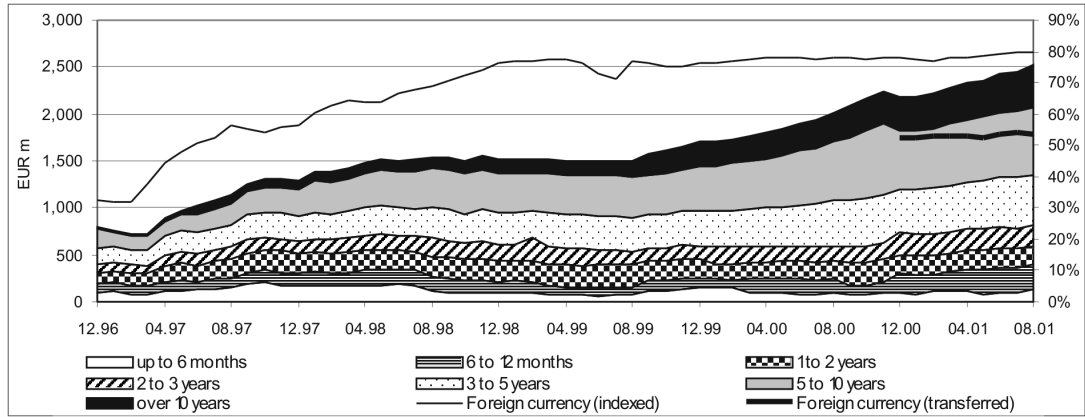


Figure 4a. Banks loan portfolio by maturities (million EUR, left scale) and the share of foreign currency loans (% , right scale)

Table 1a. Commercial banks balance sheet (million EUR)

	31.12.96	31.12.97	31.12.98	31.12.99	31.12.00	30.06.01
Financial claims	1,045.7	1,758.2	1,892.2	2,175.5	2,843.4	3236.0
Domestic	875.3	1,449.9	1,626.3	1,894.7	2,447.7	2,556.8
Reserves in central bank	77.0	194.0	233.8	310.2	365.0	231.8
Credit institutions	70.7	23.2	1.2	4.3	9.0	10.9
Financial institutions	113.4	196.9	262.4	364.8	668.8	807.7
Public sector	10.9	12.9	13.4	32.1	55.2	61.2
Enterprises	487.9	760.2	848.5	847.8	917.2	967.6
Households	115.4	262.7	266.9	335.5	432.5	477.8
Non-residents	170.4	308.4	265.9	280.8	395.7	679.1
Credit institutions	126.2	205.8	190.5	206.4	314.3	604.2
Financial sector	1.5	13.6	11.9	18.5	5.7	7.6
Non-financial sector	42.6	89.0	63.4	55.9	75.7	67.4
Securities portfolio	222.5	544.5	405.6	495.3	532.0	578.7
Residents	153.3	360.3	271.3	242.4	287.8	279.1
Non-residents	69.2	184.3	134.3	252.9	244.2	299.6
Non-financial assets	198.3	290.9	322.3	337.5	319.9	296.8
Total assets	1,466.5	2,593.7	2,620.0	3,008.4	3,695.3	4,111.6
Financial liabilities	1,158.1	1,846.0	1,749.9	2,122.5	2,652.0	2,996.1
Domestic	919.3	1,246.8	1,229.7	1,444.6	1,906.4	2,191.0
Central bank	3.1	1.5	0.9	0.7	0.5	0.5
Credit institutions	66.6	29.1	0.8	5.9	11.4	19.3
Financial institutions	32.0	34.9	40.9	48.9	71.6	88.7
Public sector	220.5	266.4	189.6	148.7	198.5	249.6
Enterprises	217.4	462.7	486.6	595.5	734.0	803.5
Households	279.9	452.1	510.9	644.8	890.4	1,029.5
Non-residents	238.8	599.2	520.2	677.9	745.6	805.0
Credit institutions	131.0	400.4	340.5	392.1	388.9	380.2
Financial sector	1.3	4.8	49.3	45.2	53.1	50.3
Non-financial sector	106.5	194.0	130.4	240.5	303.5	374.4
Securities issued	34.2	261.0	250.7	225.2	331.9	348.3
Residents	4.3	23.6	12.8	28.6	27.6	10.1
Non-residents	29.9	237.4	237.9	196.6	304.3	338.1
Other liabilities	115.0	145.3	119.9	121.9	180.5	170.3
Capital items	159.1	341.4	499.5	538.7	530.9	596.9
Total liabilities and capital	1,466.5	2,593.7	2,620.0	3,008.4	3,695.3	4,111.6

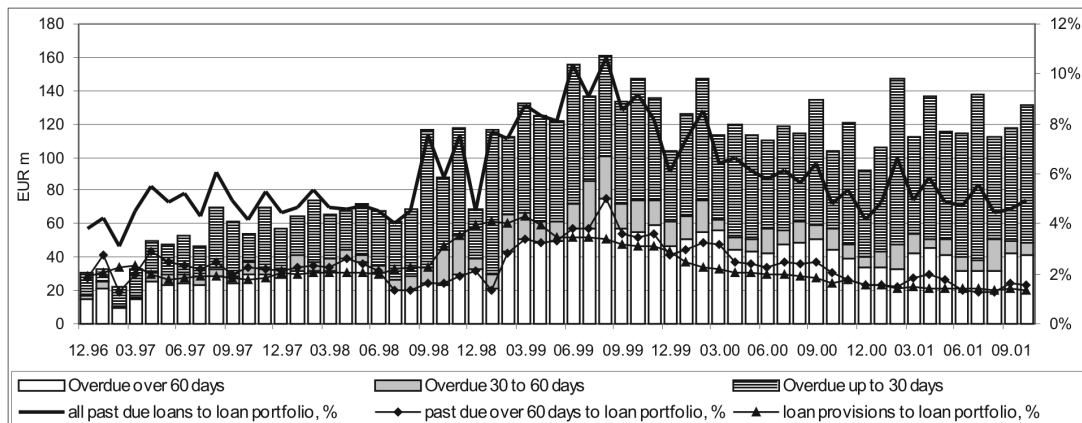


Figure 5a. Banks' overdue loans and loan provisions (million EUR and % of loan portfolio)

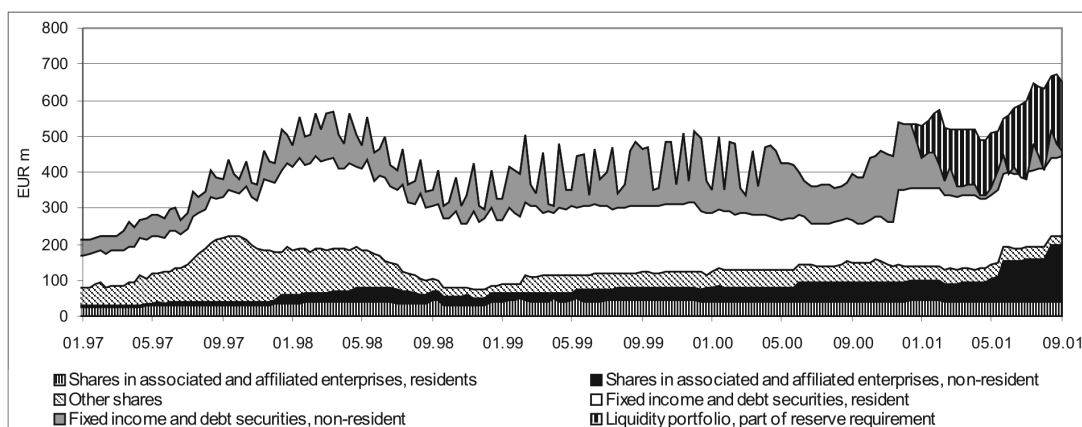


Figure 6a. Banks' securities portfolio (million EUR)

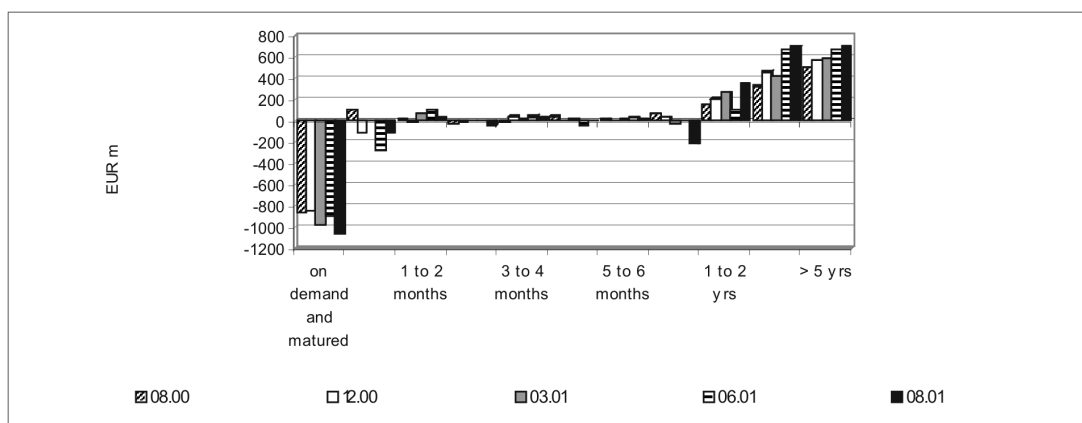


Figure 7a. Banks' net positions by maturities (million EUR)

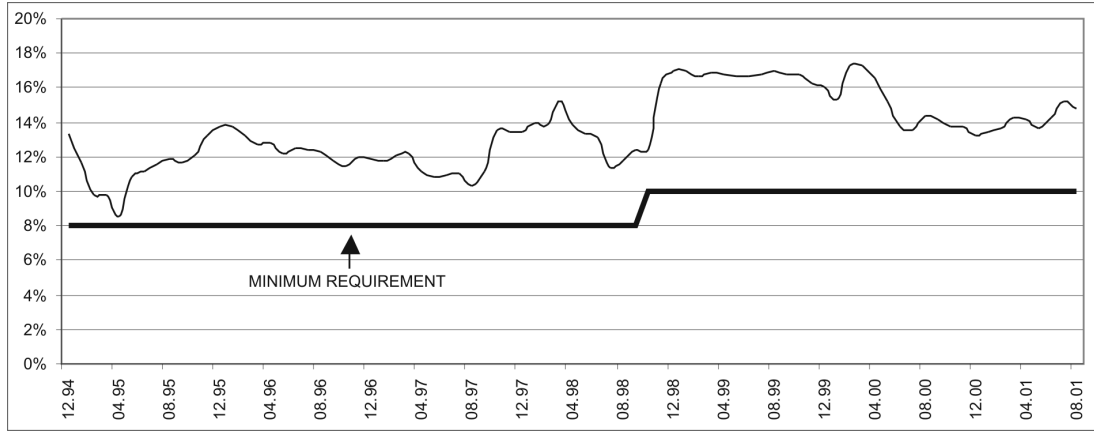


Figure 8a. Banks' capital adequacy

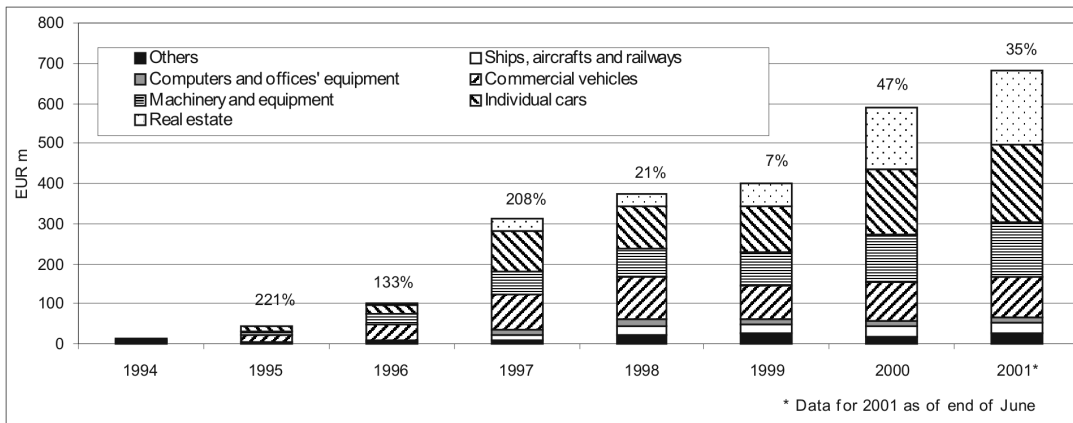


Figure 9a. Volume and structure (million EUR) and annual growth rate (%) of leasing portfolio

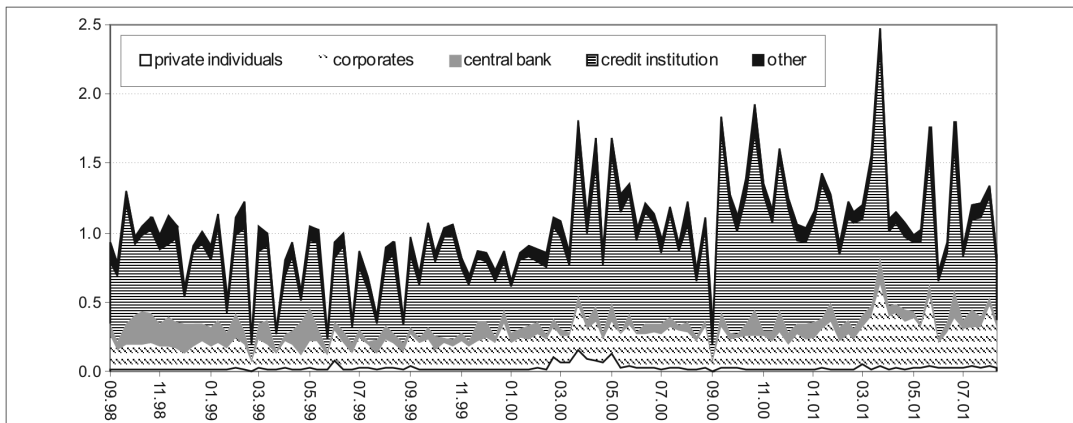


Figure 10a. Estonian forex market turnover in a ten days (billion EUR)

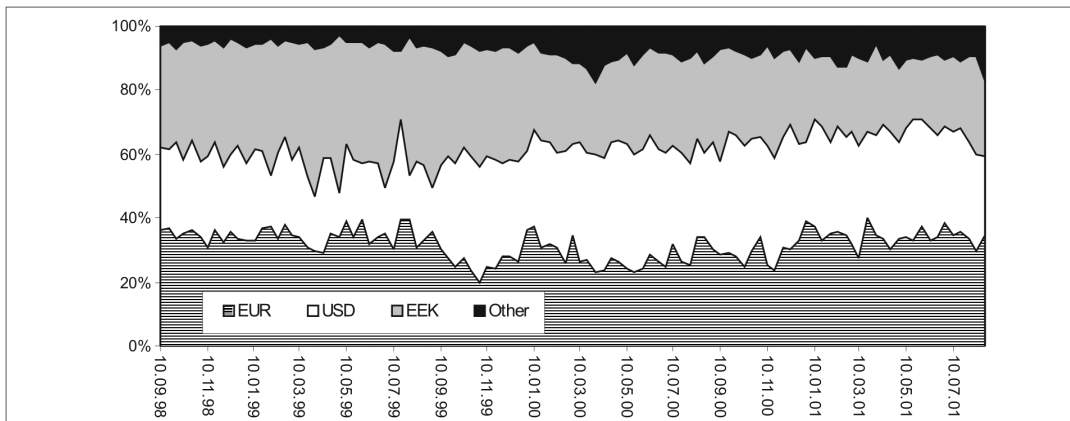


Figure 11a. Main trading currencies in the Estonian forex market (%)

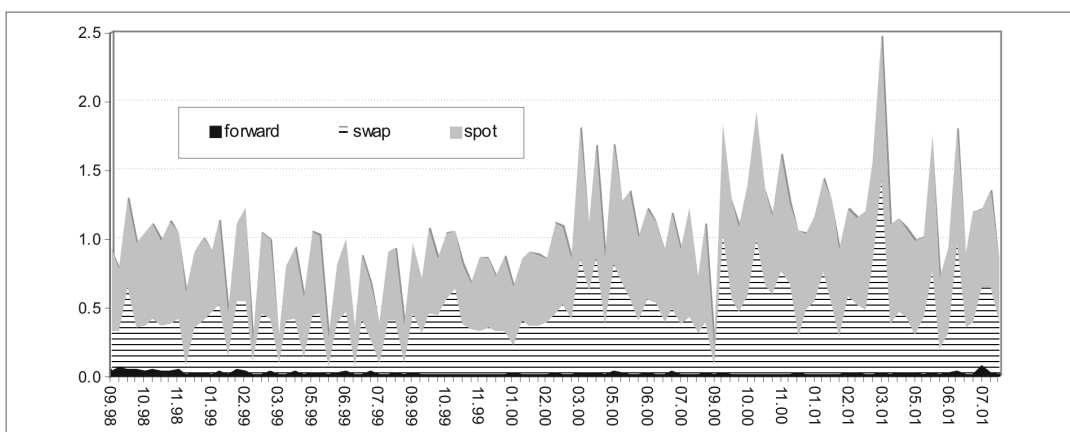


Figure 12a. Estonian forex market turnover in a ten days by instrument (billion EUR)

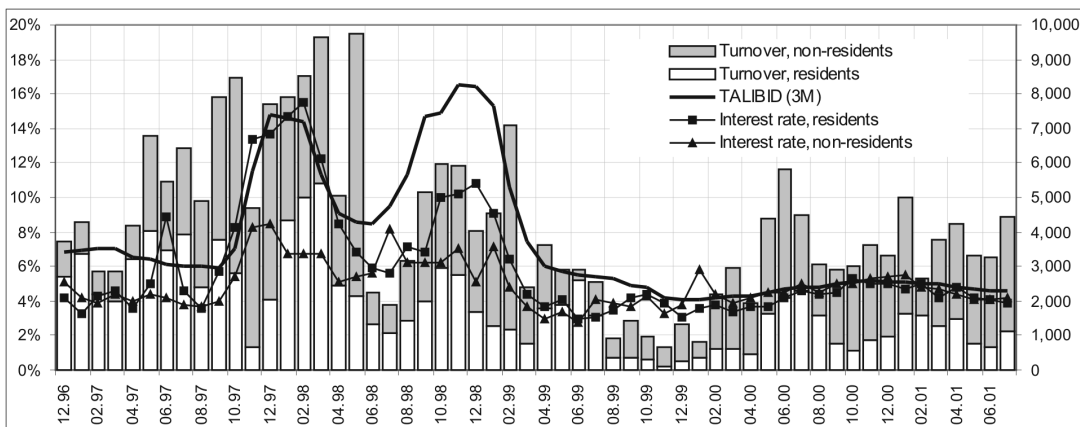


Figure 13a. Turnover of banks' short-term (up to 3 months) liabilities (contracted with credit institutions, million EUR) and respective interest rate (%)

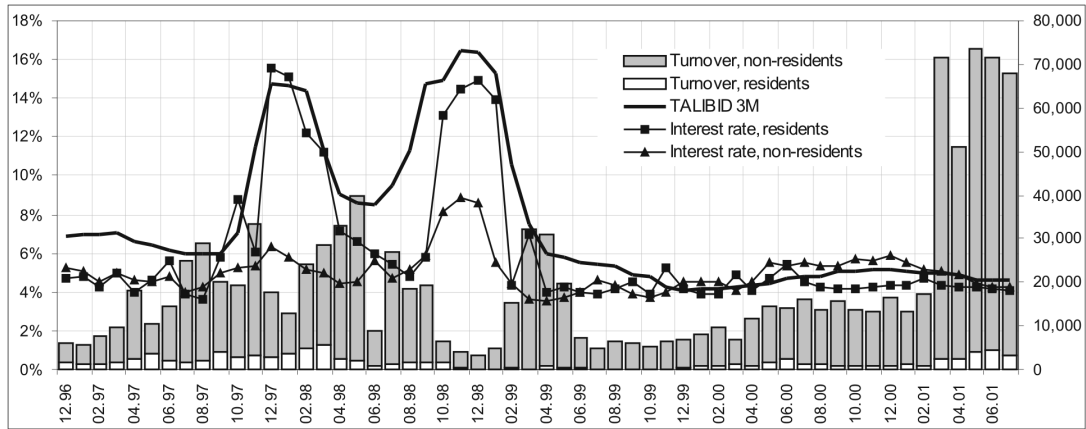


Figure 14a. Turnover of banks' short-term (up to 3 months) assets (contracted with credit institutions, million EUR) and respective interest rate (%)

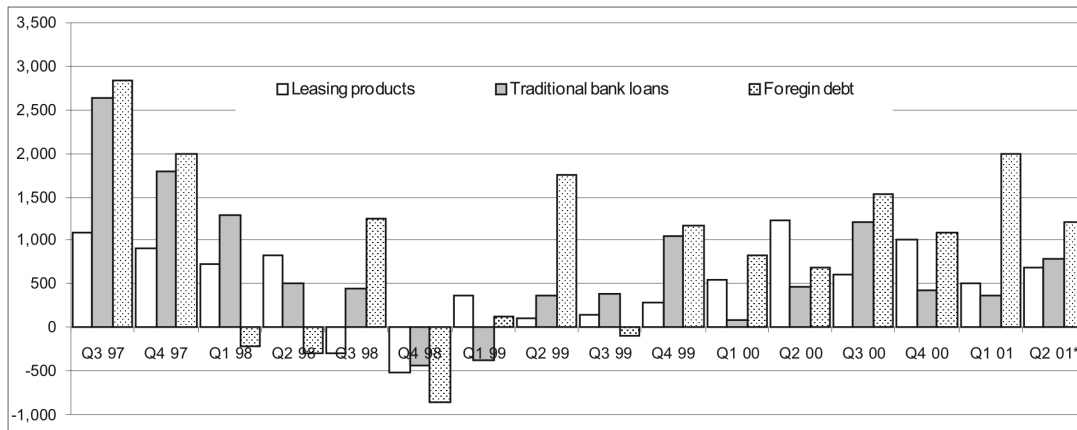


Figure 15a. Changes in domestic real sector's stock of debt outstanding (EUR m)

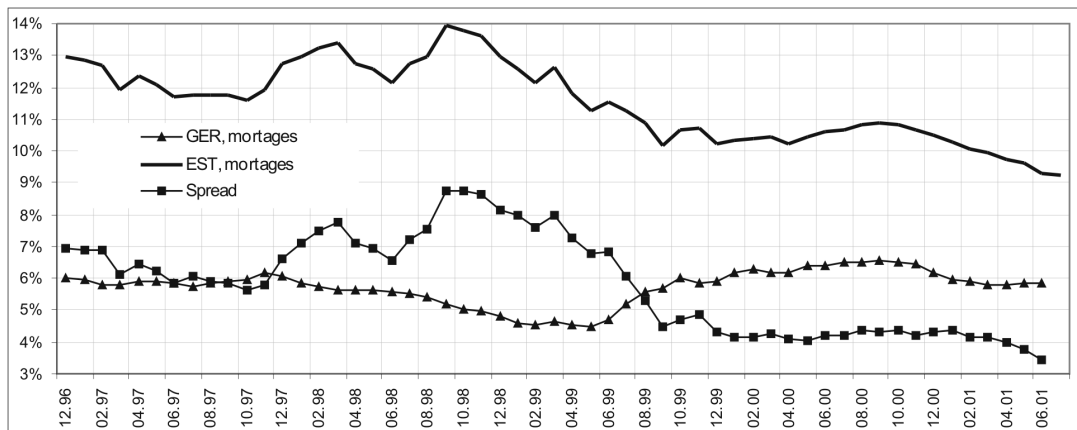


Figure 16a. Average interest rates of Estonian and German mortgage loans

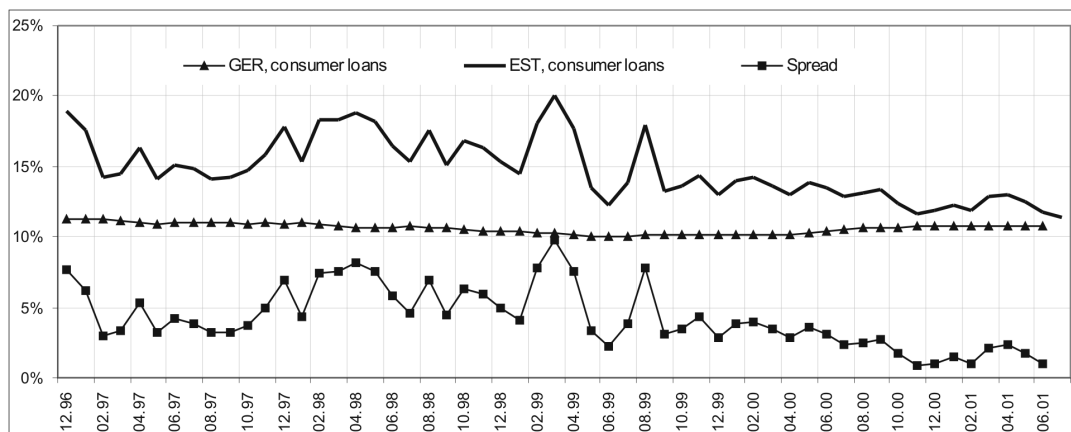


Figure 17a. Average interest rates of Estonian and German consumer loans

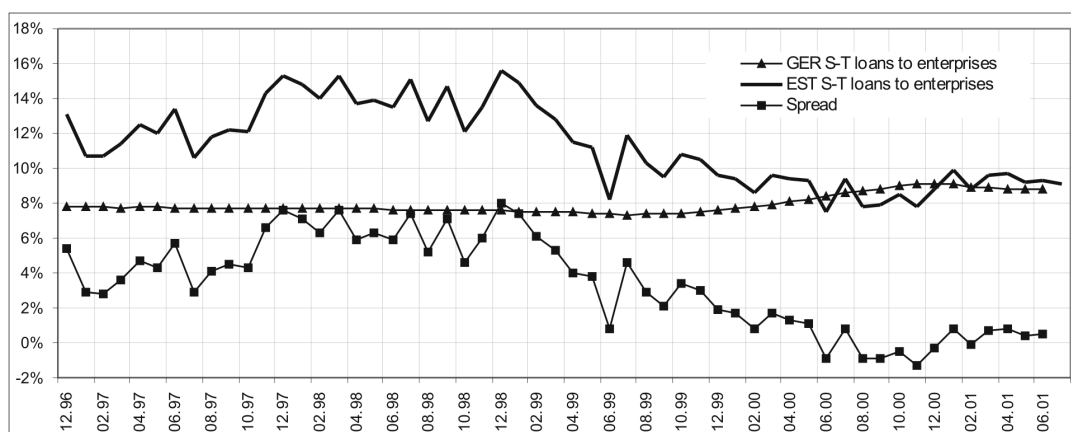


Figure 18a. Average interest rates of short-term loans to Estonian and German companies

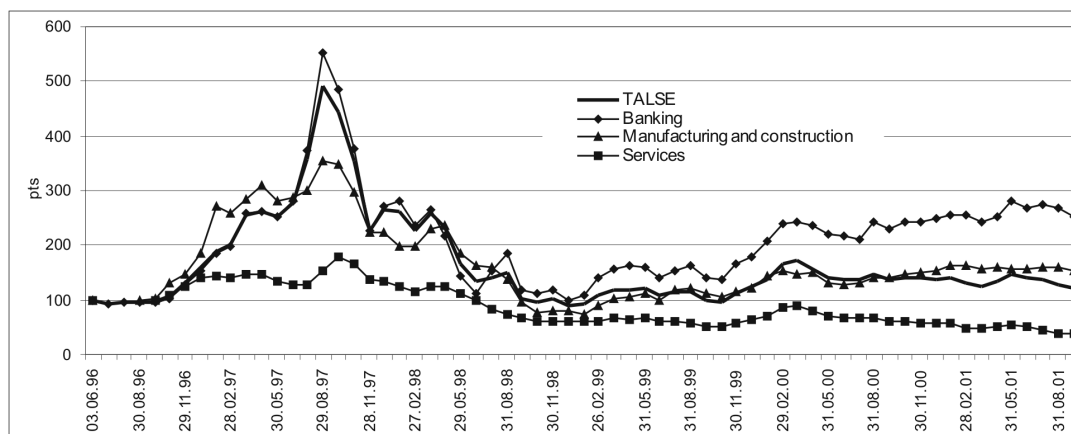


Figure 19a. The main index (TALSE) and sectoral indices of Tallinn Stock Exchange (pts)

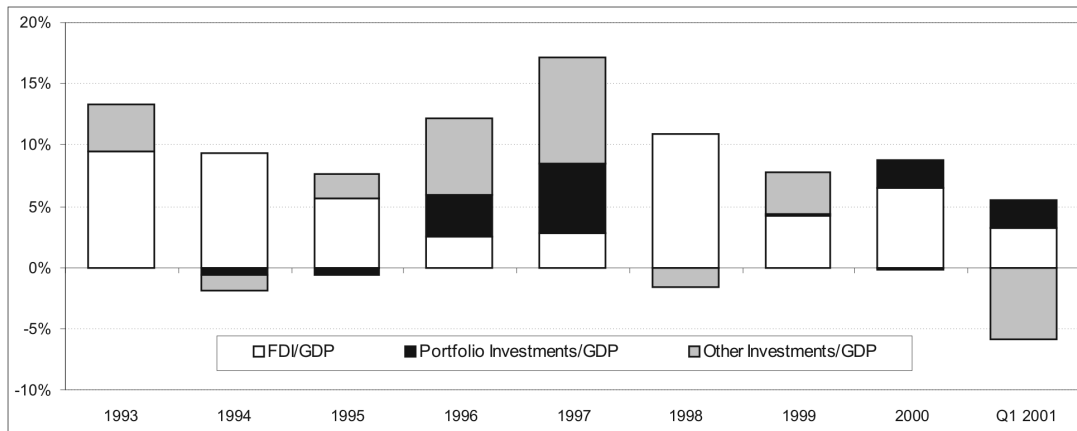


Figure 20a. Net capital inflow as a share of GDP

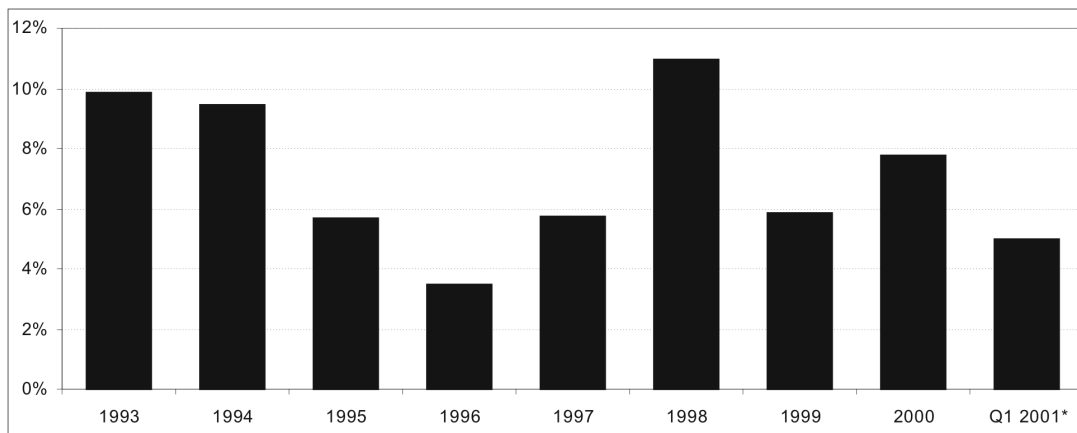


Figure 21a. FDI inflows into Estonia as a share of GDP

Table 2a. FDI flows by economic sectors (equity investments and other flows) in Balance of Payments (million EUR)

	1996	1997	1998	1999	2000	Q1 2001
FDI	97.9	113.8	510.8	205.3	264.7	194.3
Abroad	-19.5	-124.0	-18.4	-91.3	-210.3	-142.5
Financial sector	2.3	-71.1	-24.6	-43.7	-102.6	-62.2
Real sector	-21.8	-52.9	6.2	-47.6	-98.7	-80.2
Estonia	113.0	160.1	504.4	257.8	343.0	270.4
Financial sector	0.6	23.8	287.5	44.9	124.5	5.3
Real sector	112.4	136.3	216.9	212.9	218.5	265.1
Reinvested earnings (net)	4.4	77.7	24.7	38.7	123.0	66.4

Table 3a. Portfolio investments and other flows by economic sectors in Balance of Payments (million EUR)

	1996	1997	1998	1999	2000	Q1 2001
Portfolio investments and other flows	417.8	622.5	412.9	360.9	346.3	-76.9
Assets	-66.5	-568.5	-185.1	-295.5	-230.8	-602.1
<i>Financial sector</i>	-14.5	-410.5	-17.1	-206.9	-147.2	-436.5
<i>Real sector</i>	-44.2	-132.5	-111.8	-21.5	-108.1	-159.2
<i>Public sector</i>	-7.8	-25.5	-56.1	-67.1	24.5	-6.4
Liabilities	484.3	1,191.0	597.9	656.4	577.1	525.1
<i>Financial sector</i>	283.0	980.3	301.5	182.7	180.8	168.4
<i>Real sector</i>	187.3	247.7	311.8	450.1	416.2	372.8
<i>Public sector</i>	14.0	-37.1	-15.3	23.7	-20.0	-16.0

Table 4a. Foreign Direct Investments by economic sectors in International Investment Position (million EUR)

	1998	1999	2000	Q1 2001
Direct investments	1,391.2	2,174.3	2,564.5	2,253.8*
Direct investments abroad	170.0	278.4	277.2	296.1
<i>Financial sector</i>	97.0	174.5	87.7	89.1
<i>Real sector</i>	73.0	103.9	189.5	207.0
Direct investments in home country	1,240.3	2,070.4	2,465.1	2,549.9
<i>Financial sector</i>	197.0	388.6	639.8	630.3
<i>Real sector</i>	1,043.3	1,681.8	1,825.2	1,919.6
Reinvested earnings (net)	321.0	382.3	376.7	na

Table 5a. Portfolio and Other Investments by economic sectors in International Investment Position (million EUR)

	1998	1999	2000	Q1 2001
Portfolio and other investments	452.7	594.6	420.8	279.1
Assets	1,801.6	2,122.9	2,518.7	2,718.4
<i>Financial sector</i>	563.6	740.8	1,002.7	1,310.6
<i>Real sector</i>	456.7	401.0	428.8	475.1
<i>Government</i>	83.7	128.9	94.0	91.5
<i>Central bank foreign reserves</i>	697.2	852.2	993.2	841.2
Liabilities	2,254.3	2,717.5	2,939.6	2,997.6
<i>Financial sector</i>	1,213.2	1,396.3	1,552.5	1,585.4
<i>Real sector</i>	840.4	1,083.5	1,176.0	1,197.5
<i>Government</i>	200.0	237.2	207.7	214.4
<i>Central bank foreign liabilities</i>	0.7	0.5	3.4	0.3