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# Financial Market in Poland

1998-2001

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Warsaw, August 2002

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Design, cover Photo:

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Printing:

NBP printshop

Published by:

National Bank of Poland  
Department of Information and Public Relations  
Phone (48 22) 653 27 97  
Fax (48 22) 563 13 21  
<http://www.nbp.pl>

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## Introduction

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Central banks analyze financial markets, because the initial impulses of the monetary policy go through them, before they reach the real economy. The effectiveness of monetary policy depends, to a large extent, on the degree of the development of financial markets. For these reasons, the National Bank of Poland has been analyzing the development of financial markets in Poland over the past ten years.

The definition of what is a *domestic financial market* is not easy in the environment of progressing globalization. Increasing internationalization of the financial markets resulted in a growing presence of foreign investors in the domestic markets. To set a border line between domestic and international financial market is becoming increasingly difficult.

For the purposes of this review we assumed that the *domestic financial market* comprises these segments, where transactions involve financial instruments denominated in the zloty, and at least one of the counterparties to a transaction is a domestic entity. This definition was adopted for practical reasons: we are able to collect data on transactions executed by the domestic entities, while, in general, we are not able to collect data on transaction involving instruments denominated in zloty, where both counterparts are foreign entities.

Financial markets have been developing in Poland since the beginning of the 1990. The first to develop was the interbank deposit market, which enabled banks to manage their liquidity. The next to develop was the Treasury bill market, which enabled the government to fund budget deficits. The introduction of partial convertibility of the zloty resulted in the emergence of the foreign exchange market in the early 1990. The stock exchange was developing simultaneously with the interbank markets, mainly as a result of privatization. The introduction of the trading band for the Polish zloty was a stimulus for the emergence of the forward foreign exchange market, which enabled hedging against the exchange rate risk. Gradually, the foreign exchange options market developed.

The development of the domestic financial market was accelerated in mid-1990, when the scale of transactions and the overall turnover grew rapidly. The domestic financial market became increasingly liquid and offered an increasing spectrum of opportunities to use different instruments enabling financial management.

The stimulus to the development of the bond market was the decelerating inflation, which allowed the government to limit the issue of floaters and to increase the issues of fixed rate bonds. Liberalization of forward transactions in 1998 enabled the development of foreign exchange swaps, which became the most liquid component of the domestic money market in Poland. The emergence of the liquid foreign exchange *swap* market allowed, in turn, for the emergence and the dynamic growth of the FRA (*Forward Rate Agreement*) market, offering hedging against interest rate risk.

A progressing integration of the domestic financial market with the international financial market, gave the domestic entities an access to the derivative markets abroad, for example the access to the London IRS (*Interest Rate Swap*) market, which offered hedging against price risk in the bond market. The opportunity to use the IRS contracts not only increased the range of possibilities to manage interest rate risk but also contributed to the development of the bond market itself, as the reduced price risk contributed to the development of the secondary bond market.

The main purpose of this review is to present the available information on the development of individual segments of the domestic financial market in 1998-2001. The report offers some elements of the evaluation of the development of the domestic financial market focusing on the

barriers to development of particular market segments. However, the recent review does not aspire to become a comprehensive analysis of the conditions, in which the financial markets in Poland developed. Such an attempt will be undertaken in the next editions of the *Report*.

This edition of the *Report* contains of 7 chapters. Chapter 1 presents the sources of data and the definitions assumed by the authors. The core of the *Report* consists of chapters 2 – 6, which describe individual segments of the Polish financial market in 1998-2001. The final part of the *Report* formulates general conclusions on the direction of future development of the domestic financial market.

## 1

## Sources of information and methodological framework

The *Report* is the first attempt to present a comprehensive set of available information on financial markets in Poland. The main challenge we faced was that the information at our disposal is obtained from various sources and it is not standard. Nonetheless, we decided to use all available data, while clearly stating the differences between them.

This chapter discusses:

- Sources of information used to assess the size of individual financial markets, their liquidity, and the role, which is played in these markets by various types of entities,
- The definitions used to determine the size and the liquidity of individual markets.

The more detailed information on the problems discussed here is presented in Appendix 1.

The fact that, until now, there was no overall report on the development of financial markets in Poland resulted from the diversity of sources of information. The unregulated nature of the interbank markets is also an important factor, as it is not possible to obtain information from one source (which is possible in centralized trading or clearing systems), and there is the necessity to rely on information collected indirectly, mainly from various types of bank reports prepared for the central bank.

In order to have a clear picture develop a full picture of the conditions prevailing in a given market we had to use information obtained from many different sources and that produces important negative consequences. In some cases, as in the case of the FRA market, the assessment of the market size is based on information obtained from all domestic banks, while the information on the turnover and the participants of the market is obtained from a select group of banks. Accordingly, some of the indicators used to assess the liquidity of the market (e.g. the ratio of the turnover to the issue) may be not fully comparable.

The most comprehensive information about the size of a market can be obtained, for obvious reasons, in case of non-tradable securities, e.g. the NBP bonds indexed to the inflation. The information on the size of the issue can be obtained from the issuer.

The problem of sources of information is more complex in case of other securities. The full information is available in case of the Treasury paper and the equities. This results from the fact, that the sources of information are institutions or their units, which perform functions of central securities depositories as the National Depository of Securities (Krajowy Depozyt Papierów Wartościowych) and the National Bank of Poland (depository systems, Central Register of Treasury bills and Register of Money Market bills). Some of the securities, however, are not recorded in the central depository, e.g. commercial paper. Information on the size of the issues in these markets can only be obtained from banks managing these issues. The information used in this *Report* was obtained from the group of banks, which play the role of the *money market dealers*. The *Report* uses also other sources of information, such as the publications of the Center for Rating and Analysis CERA<sup>1</sup> "Rating and the Market". The data, which comes from sources other than the central depository systems, should be treated with caution, as there are sometimes significant differences between data obtained from different sources. In some cases the data are not available, as it is in case of the data on the turnover in the commercial paper market.

<sup>1</sup> Fitch Poland, starting from November 2001.

In case of derivatives traded on the stock exchange, the main source of information are exchanges, which organize trading for a given instrument. The source of information on the OTC derivative market, foreign exchange market, and depo market are commercial banks. The assessment of the size of these markets is based on banks' monthly reports. Since such reports were designed for purposes other than the analysis of financial markets, the data are incomplete. Additionally, there are frequent errors in the reporting, which regards mainly to the classification of particular operations of banks. Accordingly, the information on the size of the banks' positions in derivative instruments must be treated with caution. Nonetheless, the available data reflect properly the trends in these markets. An additional problem stems from the fact that the information from this source has been available only from June 1999. A source of information on the turnover in this segment of the market are banks, which play the role of the money market dealers. The information on the depo market is obtained also from the Payment Systems Department of the NBP.

Similarly, significant difficulties in the comparative analysis of individual markets are caused by different classification of participants in different markets. The differences are associated with:

- An absence of common standards in this area,
- Various functions performed by the systems from which the information is obtained (which translates into varying scopes of information).

The most detailed information is available from banks playing the role of money market dealers. This reporting system was developed by the NBP to monitor the OTC markets. The possibilities to obtain information on other areas are much more limited. The illustrative example are statistics on the participants of the interbank derivative market (forward contracts and options). The current system allows to assess the scope, in which the instruments are used by residents and non-residents. Unfortunately, to obtain the same information on forward foreign exchange market is not possible.

In the period analyzed in this report, the limited scope of statistical functions performed by the NDS was a significant problem. To overcome these problems, the NBP enlarged the reporting system of banks playing the role of money market dealers.

To estimate the size of individual financial markets proved to be equally complex. No uniform definition could be used due to the varying nature of the financial instruments.

The easiest solution would be to determine the size of the markets for securities. In such situations it may be assumed that the stock of the issued securities. However, even in this case there are differences between the definitions used by various markets:

- In case of debt instruments, it is nominal value of all issues,
- In case of equities it is the market value of stocks for a given day (market capitalization).

A more complex procedure of market size estimation had to be used in case of money market instruments, which are not securities, and in case of forward and derivative instruments, which are not traded on organized exchanges. The size of the market is defined as the sum of the volumes bought and sold as shown in the balance sheets of the reporting institutions. The double counting is eliminated in the second stage.

Unfortunately, it was not possible to use such procedure in the case of many instruments. Thus, the precise assessment of the size of the markets was not also possible. This resulted from the nature of the existing system of banking statistics, which was created for different purposes. In the current reporting system, the breakdown of bank counterparties is "residents" and "non-residents". The "residents" section inform on transactions executed, with domestic banks (included in the reporting system) and non-bank entities (not included in the reporting system). If we assume that the size of the market (in case of all the instruments from this group) covers the volume of bought and sold contracts reported by all domestic banks, the result will be a distorted picture of the market size. In case of transactions between domestic banks, which report to the NBP, we will have the gross volume of transactions, as the same transaction will be counted as a purchase of an instrument by



one bank and as a sale of the same instrument by another bank. Transactions of the same bank with non-residents and non-bank domestic entities will show the net volume, because foreign entities are not included in the NBP reporting system. As it is not possible to distinguish between reporting and non-reporting entities in the “resident” category, the adoption of a single standard for all markets would result in underestimation or overestimation of the size of the market.

To overcome such problems we do not use standard definitions for this group of instruments. For some instruments such definitions were adopted to minimize the margin of error in the evaluation of the size of a market. Nonetheless, we adopted individualized approach to different markets. However, the cost of adopting such an approach was data on the size of individual markets are not fully comparable.

For the majority of markets their size is defined as the sum of balance sheet values of instruments sold to residents by reporting banks and bought from and sold to non-residents. A modification of this approach was used in case of the interbank depo market, where both banks, which report to the NBP, and banks, which are not included in the system, are active. Another exception was the market for the *outright-forward* foreign exchange transactions, where the banking statistics show large quantities of currencies purchased by banks from the “residents”. We decided that the size of a possible error in the assessment of the size of the market requires the adjustment of basic definition. Thus we assumed that in this case the size of the market will be defined as the sum of the balance sheet values of instruments sold to and bought from the residents and non-residents.

In case of the derivatives which are traded on stock exchange, the size of the market is defined as the number of open positions or their current values calculated as a sum of open positions multiplied by the daily price of the instrument.

The foreign exchange market was the only market for which the above definitions could not be used. The measurement of the size of the market is based solely on the realized turnover, which also defines the other criterion of the degree of development of a given financial market: its liquidity.

In case of other markets, these two features may be analyzed separately. The turnover is reported on a gross basis, i.e. as the sum of volumes bought and sold by reporting institutions or by all market participants in a given period (month, quarter, year). Similarly, as in case of the market size, it was not possible to use one fully standardized definition of turnover. This results, among others, from different characteristics of units of turnover used in reporting systems.

Turnover in securities recorded in centralized depository systems are reported as nominal values of instruments sold and bought. An important exception is the turnover in the Treasury bond market. The gross value of the turnover in the T-bond market is based on the NDS and represents the turnover on Warsaw Stock Exchange (“WSE”), on Central Table of Offers (“CeTO”) and in interbank market (including the NBP open market operations). Turnover in the interbank market contains only the transactions, which were settled by the NDS.

Turnover in the stock market is calculated as a volume of instruments bought and sold in a given period at current market prices.

In case of derivatives traded in the regulated markets, the size of the turnover is defined as the nominal value of contracts sold and bought in a given period. Such approach allows to compare the volumes of trade on different platforms. (Only the WSE reports the market value of the turnover. The other exchanges provide their data in nominal terms.)

Unfortunately, there is no information on the size of the turnover in case of many instruments, e.g. commercial papers. This results from the absence of a centralized depository, which would register the transactions. Also the banks reporting systems do not provide complete information on the turnover in some financial markets.

The statistics on financial markets will change in the near future, mainly due to the process of adjusting the central bank reporting system to the requirements of the European Central Bank.

## 2 Money market

Money market instruments are debt instruments with maturities up to 1 year. The money market instruments used in Poland are interbank deposits, Treasury bills, NBP bills, repo, and buy-sell-back transactions, fx swaps, short-term debt issued by the corporate sector and bank short-term debt instruments (certificates of deposit).

### 2.1. Treasury bills

#### *Basic characteristics of the instrument*

The first issue of the Treasury bills took place in May 1991. Treasury bills are bearer securities, with maturities ranging from 1 week to 52 weeks. Maturities of T-bills offered during the Ministry of Finance auctions are mainly 13, 26 and 52 weeks. Starting from July 1995, only dematerialized bills are issued (in electronic, book entry form).

Treasury bills are sold with a discount and their yields are calculated on the basis of 360-day year. The nominal value of one bill is PLN 10,000.

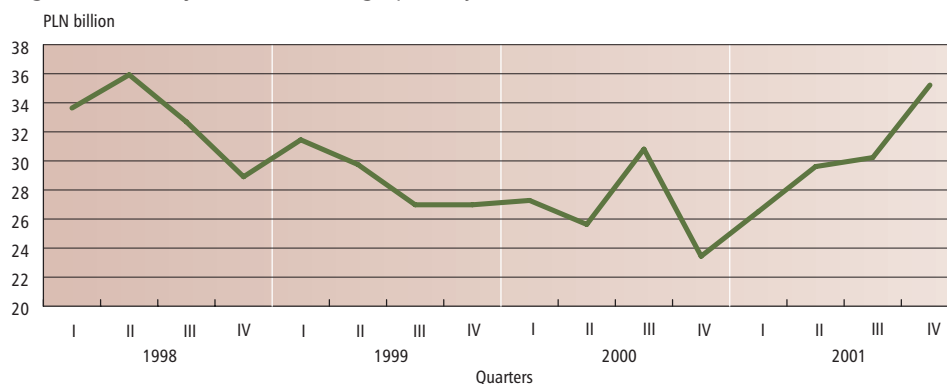
#### *Market size*

In 1990, T-bills were the main instrument of funding the borrowing requirements of the budget. In time, their role was taken over by T-bonds, which was reflected in gradual decline of the volume of T-bills in circulation. The increase in the size of the issue of T-bills in 2001 was the result of unexpectedly large increase in the budget deficit.

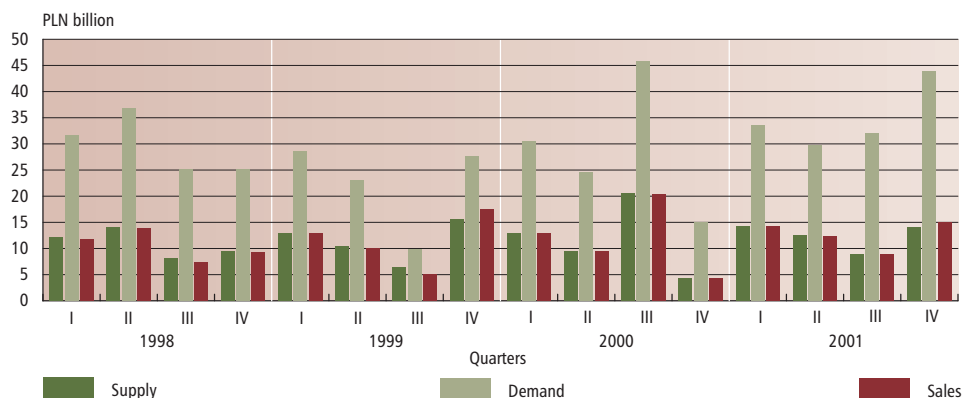
In 1998-2001, the nominal volume of the T- bills in circulation varied between PLN 23 billion and PLN 36 billion (see Figure 1).

Since the demand for T-bills always exceeded the supply, the main factor shaping the size of their issues were the borrowing requirements of the government (Figure 2).

**Figure 1. Treasury bills outstanding (quarterly)**



Source: CRTB data.

**Figure 2. Primary market of Treasury bills**

Source: CRTB data.

### *Market organization*

#### *Primary market*

Treasury bills are issued by the Ministry of Finance. The auctions, for T-bills are organized by the NBP, which plays the role of a government agent. Auctions are being held regularly during the first working day of the week. Depending on the needs of the government, the Ministry of Finance may organize additional auctions. The sale of bills is conducted in the system of the so-called American auction, which means, that buyers pay prices, which they offered.

Direct participation in auctions is reserved solely to the institutions meeting the requirements of the Ministry of Finance Issue Ordinance of August 26, 1999. The NBP evaluates the *direct* participants of the primary market for their compliance with the Issue Ordinance criteria on the quarterly basis. In 1998-2001, the number of direct participants varied from 40 to 50 and they were mainly commercial banks. Other entities purchase T-bills from direct participants of auctions.

#### *Secondary market*

The main participants of the secondary market are domestic banks. They act on behalf of their customers.

In 2001, the share of the five most active banks in the overall trade reached 61%. It was 10 percentage points more than in 1998. This reflects the tendency for the market concentration.

An important role in the development of the market was played by the money market dealer banks, which was modified in 1996 (see Box 1). Typical sizes of interbank market transactions vary from PLN 2 to 20 million, while the sizes of transactions between banks and their clients range from PLN 10 thousands to PLN 2 million.

#### *Settlement and depository system*

All transactions executed in the secondary market are registered in the Central Register of Treasury Bills ("CRTB"), operated by the National Bank of Poland (see Box 2).

#### *Investors*

The CRTB account structure allows for the identification of three types of investors: domestic banks, domestic non-bank institutions and foreign entities. The investor structure has changed in recent years. The share of the banking sector has significantly declined and was replaced by the non-banking domestic institutions sector (Figure 3).

## Box 1

## MONEY MARKET DEALER SYSTEM

Starting from 1996, the NBP selects a group of banks, which are money market dealers. These are banks, which are the most active in the secondary Treasury paper market and meet the criteria of Dealer Activity Index (DAI). The criteria binding in particular years aimed to stimulate the development of specific sectors of the financial market. Particular importance was attached to:

- Secondary Treasury bills market,
- Non-bank investors activity in the Treasury securities market,
- *Repo* and *sell-buy-back* transactions,
- Secondary market for Treasury bonds.

Good relations with the central bank were an additional element of the evaluation. In 2001, the new DAI criteria were introduced, which covered the settlement potential of banks and their activity in the FRA and IRS market. In 1998-2000, banks were evaluated on monthly basis. Since 2001 they have been evaluated quarterly.

## Box 2

## CENTRAL REGISTER OF TREASURY BILLS

CRTB is an electronic system servicing accounts of market participants. CRTB supports all types of operations in the Treasury bills market:

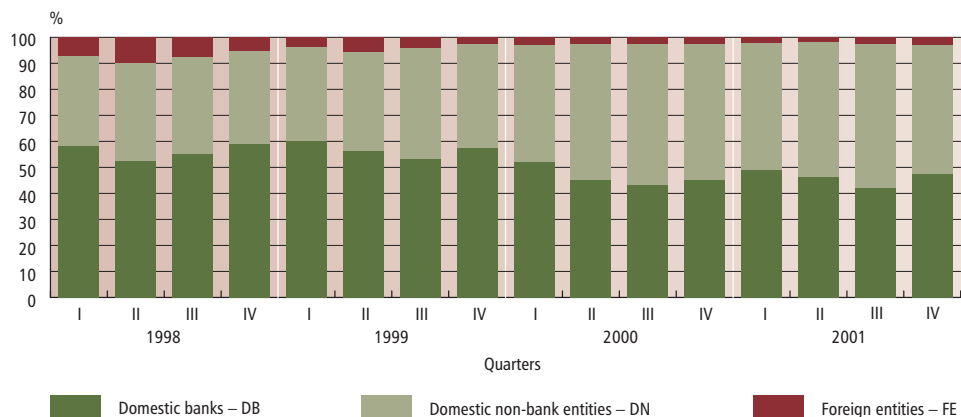
- Organization of auctions,
- Registration of transactions in the secondary market,
- Servicing lombard and technical credit,
- Redemption of bills by the issuer at maturity.

Transactions between direct participants of the CRTB are settled on a DVP basis (delivery versus payment) in real time gross settlement system\* (Model I). Participants of the CRTB are direct participants of the primary market, domestic banks (excluding cooperative banks, which do not have the status of an auction participant), the National Depository for Securities SA in Warsaw and the Bank Guarantee Fund (BGF).

In connection with the amendment of the Issue Ordinance, which was passed in late 1999, and with the change of the CRTB Rules, new titles of orders were introduced, which allowed for the identification of conditional transactions: repo and sell-buy-back and pledging Treasury bills as collateral.

\* The settlement of transactions is accomplished through:

- a) transfer of cash and securities on a gross basis (Model I),
- b) transfer of cash on a net basis and securities on a gross basis (Model II),
- c) transfer of cash and securities on a net basis (Model III).

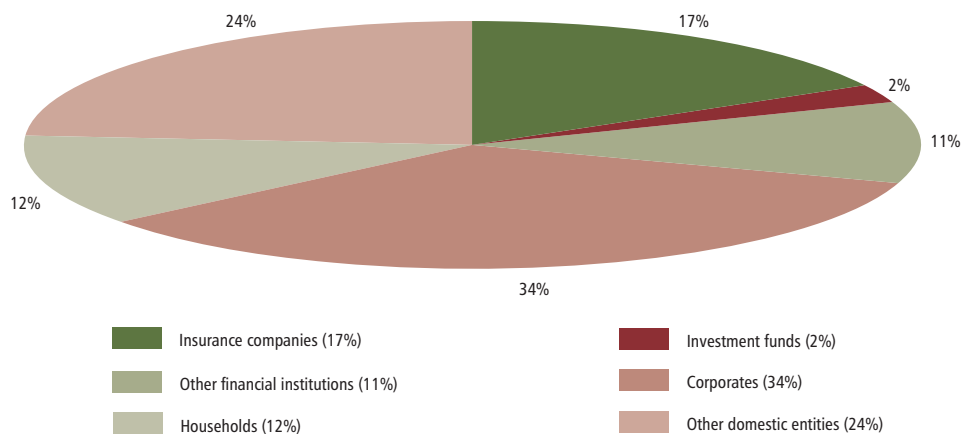
**Figure 3. The structure of depository accounts in the Central Register of Treasury Bills**

Source: CRTB data.

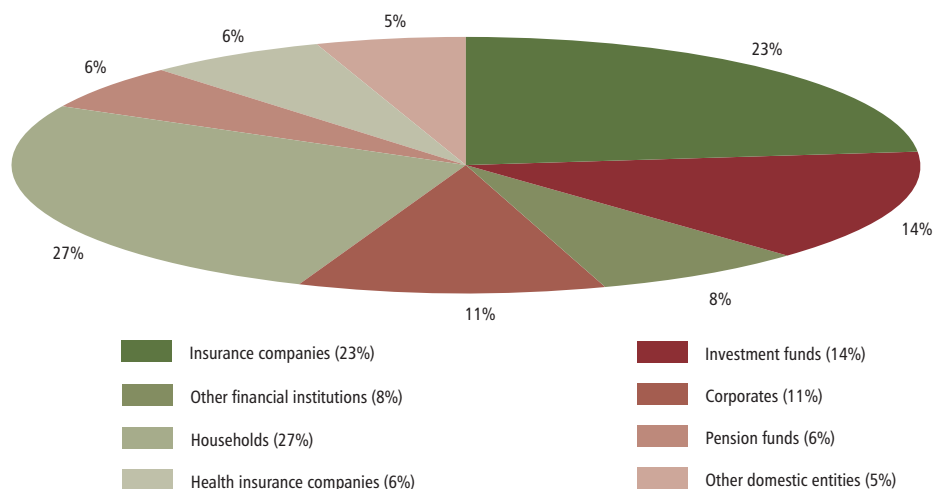
**Table 1. Treasury bills held by the domestic non-bank sector (as at the end of the period, in PLN mil)**

	1998		1999		2000		2001	
	PLN mil	%	PLN mil	%	PLN mil	%	PLN mil	%
Insurance companies	1,247.4	17.0	1,467.4	19.0	2,278.3	26.7	2,910.5	23.3
Mutual and investment funds	174.5	2.4	547.7	7.1	380.1	4.5	1,765.8	14.2
Other financial institutions	779.8	10.6	731.8	9.5	1,049.4	12.3	942.4	7.6
Non-financial legal entitiesCorporate sector	2,520.7	34.3	1,907.8	24.8	641.5	7.5	1,365.2	10.9
Households	871.3	11.9	1,683.1	21.9	1,344.1	15.7	3,319.5	26.6
Pension funds	–	–	0.0	0.0	1,943.5	22.7	712.4	5.7
Health insurance organizations	–	–	–	–	542.0	6.4	794.8	6.4
Other domestic entities	1,747.0	23.8	1,362.2	17.7	357.2	4.2	665.2	5.3
<b>Total</b>	<b>7,340.7</b>	<b>100</b>	<b>7,700.0</b>	<b>100</b>	<b>8,536.1</b>	<b>100</b>	<b>12,475.8</b>	<b>100</b>

Source: Reports of dealer banks and applicants for the function.

**Figure 4. Investors in the Treasury bills market. Domestic non-bank sector in 1998**

Source: Reports of money market dealer banks and applicants for the function.

**Figure 5. Investors in the Treasury bills market. Domestic non-bank sector in 2001**

Source: Reports of money market dealer banks and applicants for the function.

The most dynamic growth was displayed by insurance companies and households. The share of foreign investors was the highest in mid 1998, when it reached 10%. In 2001, it amounted to only 3%. The weakening demand of the foreign investors was a result of liberalization of the foreign exchange law. Foreign investors prefer fx swaps as synthetic short-term zloty instruments.

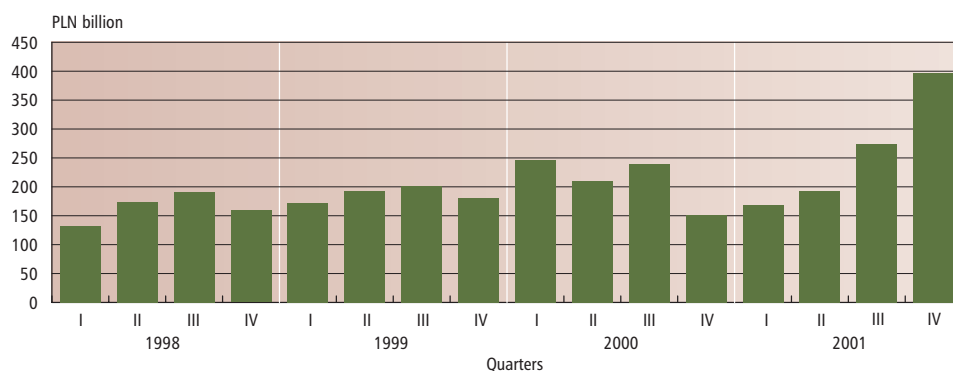
Additional source of information on the structure of investors in the Treasury bill market are reports of money market dealer banks. They offer a more detailed breakdown of the domestic non-bank sector into particular categories of investors. (see Table 1 and Figures 4 and 5).

#### *Market liquidity*

Liquidity of a market can be evaluated with the help of such indicators as the volume of turnover, the ratio of turnover to the value of the issue and the size of spreads between asked and offered prices of Treasury bills in the secondary market.

#### *Gross turnover*

In the analyzed period the total monthly gross turnover of the T-bill market (including repos and sell-buy-backs) varied from PLN 41 to 147 billion. The highest turnover was recorded in December 2001 and the lowest in January 1998. The turnover of the T-bill market was constantly growing, despite periodic declines. A significant decrease was recorded in the period between fourth quarter of 2000 and the first quarter of 2001 (Figure 6).

**Figure 6. Total turnover in the Treasury bills market**

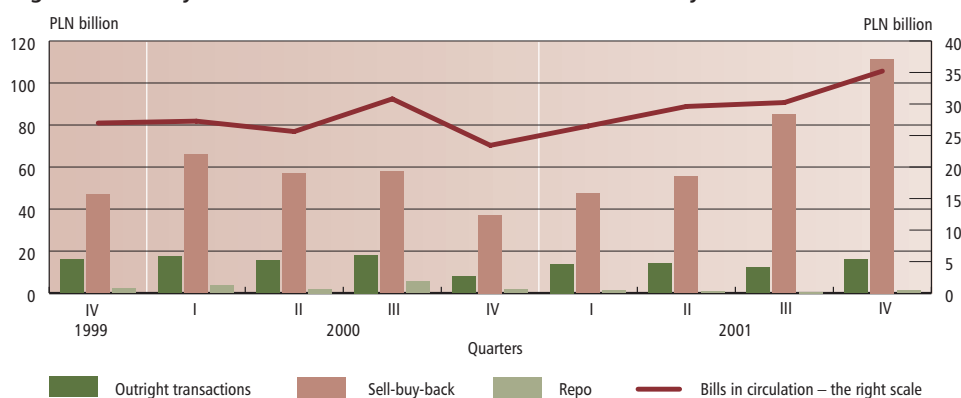
Source: CRTB data.

The growing scale of transactions was not reflected in subjective perception of the market participants, who has been signaling the decreasing liquidity of the market since 2000. This phenomenon was the result of an increase in the share of operations with non-bank institutions in the total volume of transactions in the secondary market, a process of consolidations in the banking system, and an increase in the use of Treasury bills as collateral. Most non-bank entities treat Treasury bill as an investment instrument and hold them in their portfolio until maturity. The proportion of bank transactions with non-bank entities to the total volume of turnover in the secondary market, most of which are repo and sell-buy-back transactions, is constantly growing. The proportion of outright transactions in the volume of turnover in the secondary market decreased in the analyzed period from 28% to 12%<sup>2</sup>.

#### Liquidity ratio

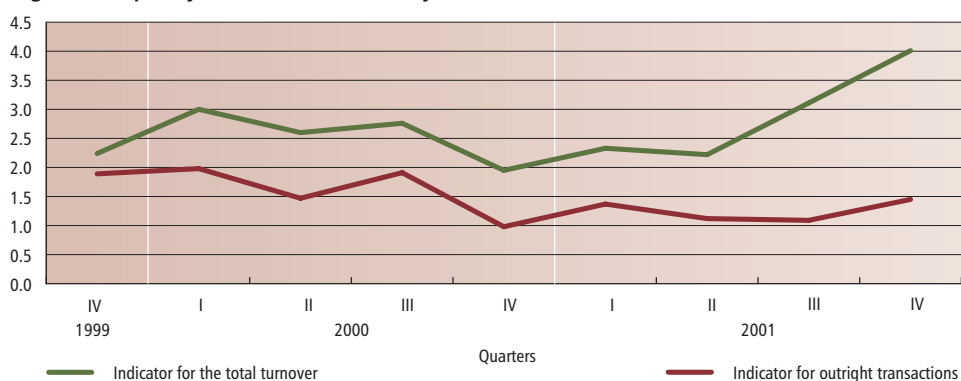
The ratio of the turnover to the stock of Treasury bills confirms decreasing liquidity of the Treasury bill market, which took place in the second half of 2000, despite the increase in the volume of conditional transactions. A similar ratio, calculated for outright transactions alone, signals even greater decrease in the market liquidity (Figures 7 and 8).

**Figure 7. Treasury bills in circulation and turnover in the secondary market**



Source: CRTB data.

**Figure 8. Liquidity of the T-bill secondary market**



Source: CRTB data.

#### Price spreads

The size of spreads in the interbank market also illustrates deteriorating liquidity of the market. Although the turbulence in the interbank market (Russian crisis), and the Year 2000

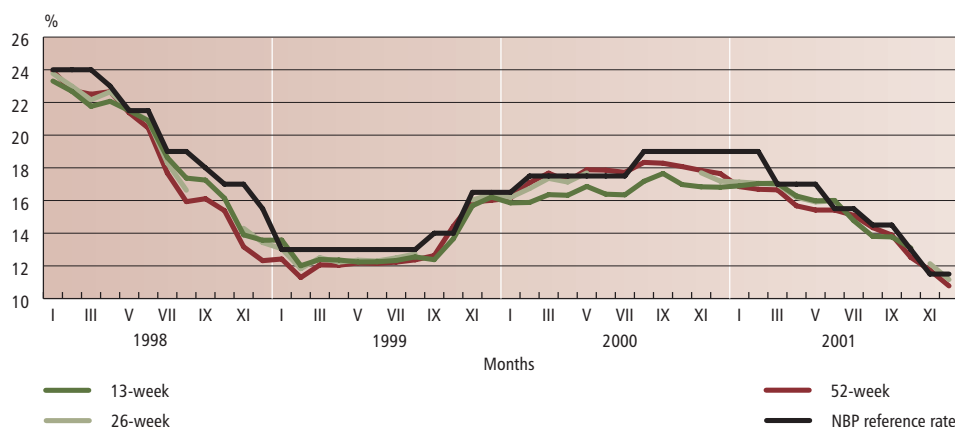
<sup>2</sup> The ratio is calculated as a monthly average in particular quarters.

Problem caused a significant volatility of spreads, the growth of average spread from 23 basis points in the first half of 2000 to 29 basis points in the second half of the year confirms a decrease in the liquidity of the market.

#### Yields

Changes in yields in the T-bills primary market are presented in Figure 9.

**Figure 9. Average yields of Treasury bills in the primary market**



Source: CRTB data.

## 2.2. National Bank of Poland money market bills (NBP bills)

### *Basic characteristics of the instrument*

NBP bills (issued since 1990) are bearer securities. Currently the NBP issues mainly 28-day bills, despite the fact that they can have various maturities<sup>3</sup>. Money market bills are sold at a discount, and their yields are calculated on a 360-day basis. Nominal value of one bill is PLN 10,000. Contrary to T-bills, they cannot be used by the NBP as collateral for lombard and technical credit. NBP as the issuer cannot be at the same time a pledge and the debtor of the receivable, which is a collateral.

Since May 1996, NBP bills are issued in dematerialized form (electronic book-entry).

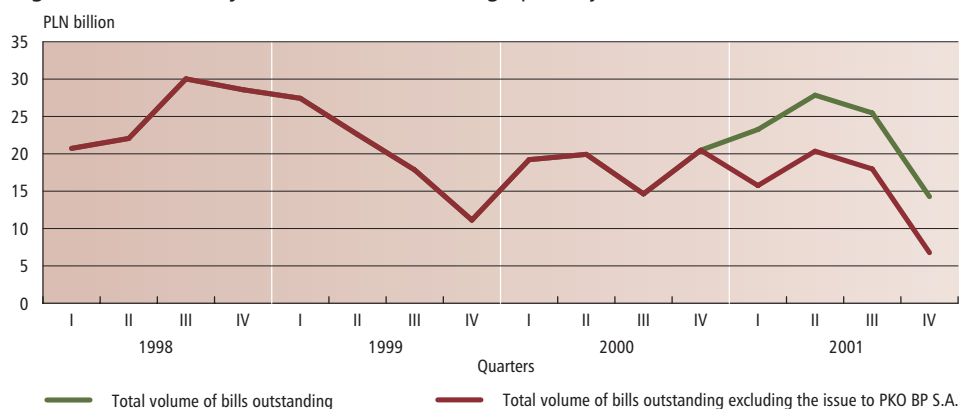
### *Market size*

The volume of the issue of money market bills depends on the volume of the excess of liquidity in the banking sector. In the analyzed period, the stock of money market bills ranged from PLN 9 billion in January 1998 to PLN 31 billion in February 1999. In late 1999, as a result of an increase in the demand of banks for liquid assets, which was associated with the Year 2000 Problem, the stock of money market bills decreased temporarily to PLN 11 billion. In February 2000, the stock exceeded PLN 24 billion again.

The size of the money market bills varied significantly in 2001. In February, the stock increased to PLN 24.3 billion, which resulted from an increase in the liquidity of banks after the central government sold foreign currency revenues to the National Bank of Poland. The lowest level of the stock of NBP bill issue was recorded in November and December (PLN 6-6.8 billion), when banks experienced liquidity problems. This resulted, among others, from a significant engagement

<sup>3</sup> Starting from 1996, the ability to issue bills with the following maturities were gradually introduced: 1-, 2-, 3-, 4-, 5-, 6-, 7-, 14-, 28-, 91-, 182-, 273- and 364-day. Until the end of 2000 no 2, 3, 4, 5 and 6-day bills were issued.



**Figure 10. NBP money market bills outstanding (quarterly)**

Source: Register of NBP Money Market Bills.

in the NBP operations in October and from the growth of central government term deposits in the central bank, which “sucked” funds out of the banking system.

The data on the issue of the NBP bills and the volume of transactions do not reflect the special issues for PKO BP S.A. Such operations aimed at smoothing the distortions in the distribution of liquidity in the banking sector. The instruments were not traded in the interbank market (Figure 10).

### **Market organization**

#### *Primary market*

The issues of NBP bills are an instrument of the monetary policy. Money market bills are sold in auctions (American auction), although the NBP reserves the right to sell the bills on a bilateral basis. The auctions were organized irregularly, in the periods when the excess of liquidity in banks put a pressure on market interest rates.

Only the money market dealer banks and the Bank Guarantee Fund had the right to participate in money market bills auctions (see Box 1).

#### *Secondary market*

Money market bills are traded in the interbank market. The trade takes form of outright transactions, repos and sell-buy-backs. In 2000, the share of five most active banks in the total turnover amounted to 57.8%, which was 8 percentage points lower than in 1998. The average value of a transaction in the interbank market is approximately PLN 100 million.

#### *Settlement and depository system*

All transactions in the secondary market are recorded in the Register of Money Market Bills operated by the National Bank of Poland. RMMB is an electronic system, in which the accounts of direct market participants are being held. The register supports all types of market operations, though, contrary to the CRTB, it does not allow for the identification of repo and sell-buy-back transactions. Transactions between direct participants are settled on the DVP basis in a real time gross settlement system according to Model I.

#### *Investors*

According to the Resolution No 35/2000 of the NBP Management Board of November 24, 2000, on the issuance of NBP bills only domestic banks and BGF (Bank Guarantee Fund) are allowed to purchase the instrument. Thus the bills are not available for domestic non-bank institutions and foreign entities.

*Market maturity**Gross turnover*

The structure of trade in the secondary market has been changing during last couple of years (Figure 11). However, similarly to the Treasury bill market, a growing share of transaction falls on repos and sell-buy-backs. The only source of data on the share of conditional transactions are the reports of money market dealer banks. Based on these reports, the NBP estimates that approximately 35% of the turnover is the result of the conditional operations.

The highest activity of banks is recorded immediately after the settlement of auctions, when money market dealers are reselling securities to other banks.

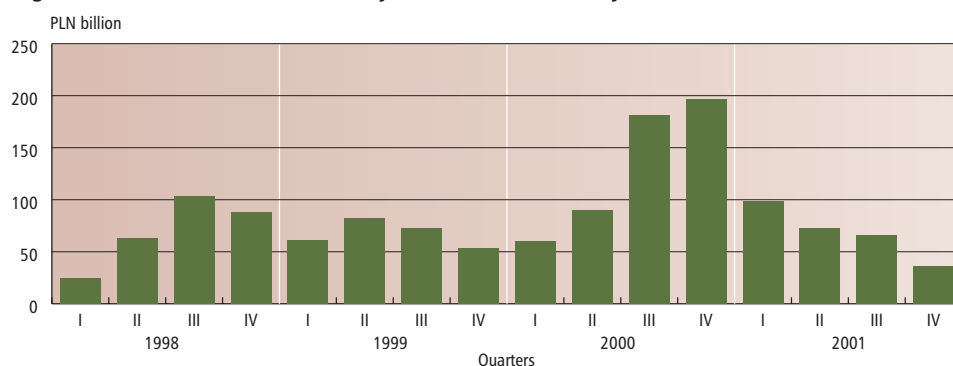
*Liquidity of the market*

A growing ratio of quarterly gross turnover in relation to the stock of NBP bills illustrates the increase in the liquidity of the market. This ratio increased from 49% in the first quarter of 1998 to 369% in the third quarter of 2000. In the following period this ratio was gradually decreasing in the consecutive quarters of 2001, to drop to 72% in the fourth quarter of the year. The decrease in the ratio was probably the result that the NBP did not take the volume of secondary market trading as one of the criterion in the selection of money market dealers.

*Yields*

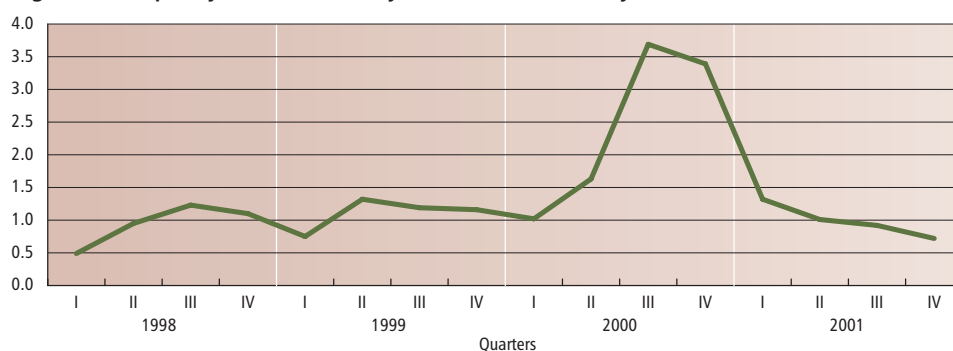
The yields in the primary NBP-bill market are presented in Figure 13.

**Figure 11. Turnover in the secondary market of NBP money market bills**

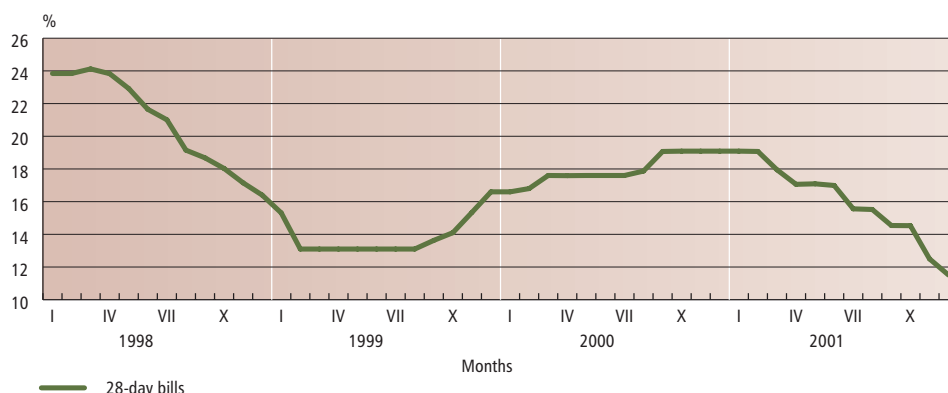


Source: Register of NBP Money Market Bills.

**Figure 12. Liquidity of the secondary market of NBP money market bills**



Source: Register of NBP Money Market Bills.

**Figure 13. Average yield of NBP money market bills in the primary market**

Source: Register of NBP Money Market Bills.

## 2.3. Short-term commercial debt securities

The market for the corporate debt is still at an early stage of the development. Nonetheless, during the last several years it has been displaying a dynamic growth. Short-term securities of non-bank institutions bear different names, which results from different legal base for an issue and marketing activities of banks organizing the issues.

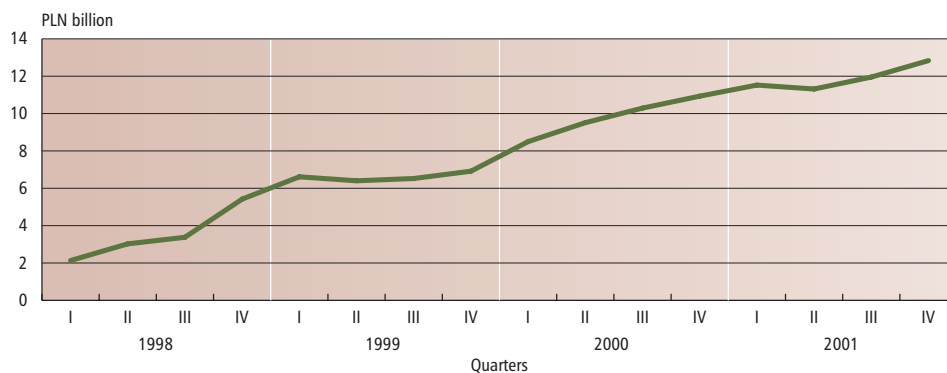
### 2.3.1. Commercial papers

#### *Basic characteristics of the instrument*

Commercial debt has been issued since 1992. They take both the material and dematerialized form. There are two types of commercial paper: discount and coupon papers. They are issued both as bearer and registered securities, with maturities ranging from 7 to 364 days, although the dominant type are papers with maturities up to 3 months. Yields are calculated on 360-day basis. The legal basis for an issue of commercial paper are Civil Code, Law on Bills of Exchange or the Law on Bonds. They constitute a competitive instruments to the short-term bank loans.

#### *Market size*

The issue of commercial paper was constantly growing. The benefit for entities obtaining funding this way is the relatively low cost of money. The benefit for investors are yields, which are higher than in T-bill market. The stock of commercial paper increased from PLN 5.4 billion

**Figure 14. Commercial papers in circulation (quarterly)**

Source: CERA S.A. (currently Fitch Polska S.A.).

in 1998 to PLN 12.8 billion in 2001 (Figure 14). The size of individual issues<sup>4</sup> varied from PLN 140 million to PLN 1 billion. The greatest volumes of commercial papers were issued by Elektrim (PLN 750 million), Thomson Polkolor (PLN 700 million), McDonald's (PLN 350 million)<sup>5</sup>.

### **Market organization**

#### *Primary market*

A peculiarity of the Polish commercial papers market is that the issues of the instrument are not public, because they are offered to less than 300 investors<sup>6</sup>. The main reason for this was the high cost of public issue and long procedures of public trading.

The main group of issuers of commercial paper are enterprises. Commercial papers were also issued by non-bank financial institutions, as National Investment Funds and leasing companies.

Issues are organized by agent banks, which distribute the securities among investors. The agent banks, which participate in the issue of commercial papers perform also other functions: organizers of secondary market, clearing custodians, and underwriters of an issue.

#### *Secondary market*

The secondary market for commercial papers is illiquid, since investors treat commercial papers as investment instruments and hold them until maturity. Among the most important barriers to the development of the commercial papers market are:

- A large portions of the stocks is held by banks, which perform the function of agents,
- Relatively high margins realized by the issue agent, which lowers yield for investors,
- The absence of a uniform legal basis for the issue of short term debt instruments,
- The absence of a centralized depository for commercial papers.

#### *The depository and settlement system*

The provisions of the Law on Public Trading in Securities allow the NDS to maintain a depository of non-public securities. Due to the high cost and complex procedures of registration of an issue in the NDS, no issue of short term debt instruments has been registered in the NDS yet. Most frequently, the register of investors is managed by the agent bank, which distributes the issue in the primary market. Such registration (conducted by a uniform clearing and settlement chamber), would be a better solution for the development of a commercial papers market.

#### *Investors*

The dominant group among the investors in CP market are banks and corporates (Figure 15). From January 2000 to December 2001, the share of investment funds increased. In the analyzed period, foreign investors' participation in the commercial papers market did not exceed 0.59% of the value of issue. This reflected both the restrictions of the Foreign Exchange Law and the illiquidity of the secondary market. (see Figure 15 on next page)

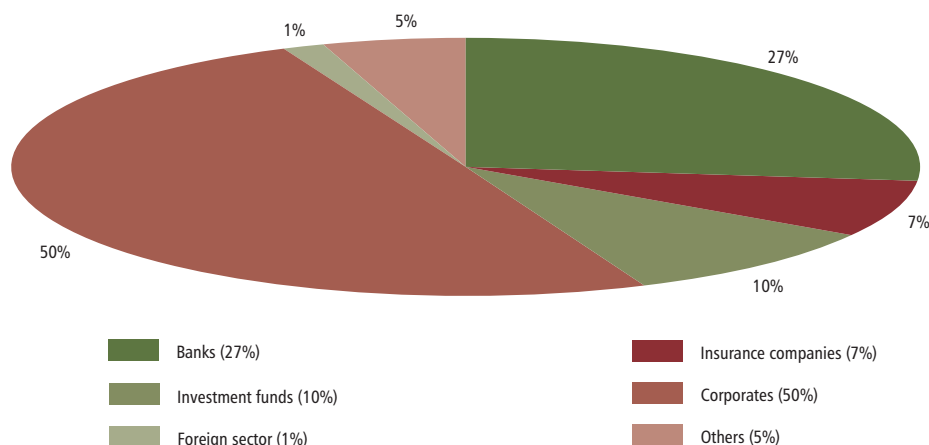
#### *Market liquidity*

The NBP does not have statistical data in the turnover in the commercial paper market, however, the limited size of individual issues, the absence of a central register and the limited access of foreign investors lead to the assumption that the turnover in the secondary market is low.

<sup>4</sup> The size of an issue program is not identical to the corporate debt resulting from the issue. The size of an issue program only sets the upper limit on the debt.

<sup>5</sup> Data based on annual reports on the state of the market prepared by CERA "Rating and Market" (currently Fitch Poland S.A).

<sup>6</sup> According to Article 2 of the Law on Public Trading in Securities of August 21, 1997 (Journal of Laws no. 118, item 754 with subsequent changes), an offer is of public nature, if it is directed to more than 300 persons.

**Figure 15. Investors in the commercial papers market in 2001**

Source: Reports of money market dealer banks and applicants for the function.

### *Yields*

The spread between commercial paper and T-bill market is around 1 – 2 percentage points.

### **2.3.2. Certificates of deposit**

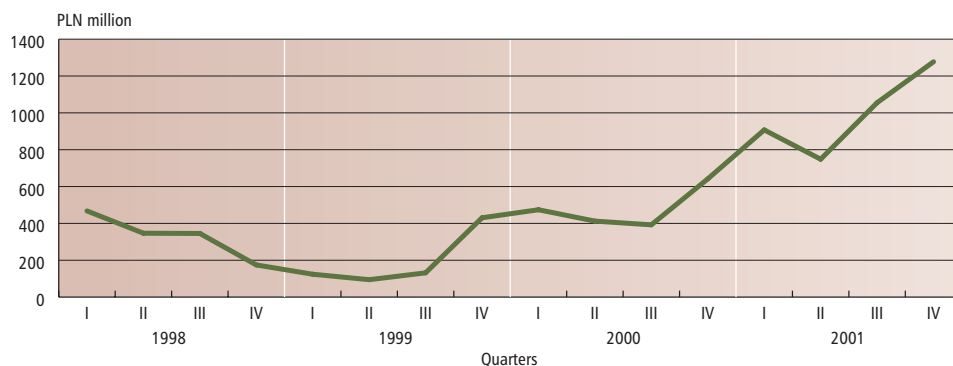
#### *Basic characteristics of the instrument*

Certificates of deposit have been issued in Poland since 1997. It is worth mentioning that after the effective date of the new Banking Law on January 1, 1998, all bank securities of which issue is based on the Law (including certificates of deposit) must include the phrase “bank security” in the name of the security (article 90). This name distinguishes bank securities from other securities, which may be issued by banks<sup>7</sup>.

Bank securities may have a material and dematerialized form. In practice, the certificates of deposit are bearer instruments and have a material form. Their yields are calculated on a 360-day basis. The nominal value of one certificate depends on the individual issue.

#### *Market size*

The dominant maturity of certificates of deposit is up to 1 year (approximately 90% of bank debt instruments issue). In 1998-2001, the total value of bank debt, resulting from the issue of

**Figure 16. Certificates of deposit outstanding**

Source: Bank Call Reporting.

<sup>7</sup> The previous Banking Law of January 31, 1989, allowed for a freedom of naming particular securities issued by banks within the banking operations conducted by them.

certificates of deposit was increasing constantly and varied between PLN 57.2 and PLN 1,488.9 million in some months (Figure 16).

Polish banks are not interested in the issue of certificates of deposit due to the excess of liquidity in the banking system and the mandatory reserve requirement regarding the liabilities from the issue of certificates, when they were purchased by non-bank or foreign entities. In 2000-2001 the issue of certificates of deposit grew by 43%. The main contributors to the growth were specialized banks, which do not have branch networks, and which obtained funding this way. A good example of such issuers are banks financing car dealers (e.g. Opel Bank S.A. and Volkswagen Bank Poland S.A.).

### **Market organization**

#### *Primary market*

The distribution of certificates of deposit is usually conducted by other bank than the issuer. The agreements between the issuer and the agent bank intend to broaden the scope of the issue of certificates of deposit. Banks, which are active in the commercial paper market, are also active in the CP market. They offer the issuers the services of a payment agent (or sub-agent), custodian or a sub-custodian.

#### *Secondary market*

Secondary market is practically non-existent due to the limited size of the issue.

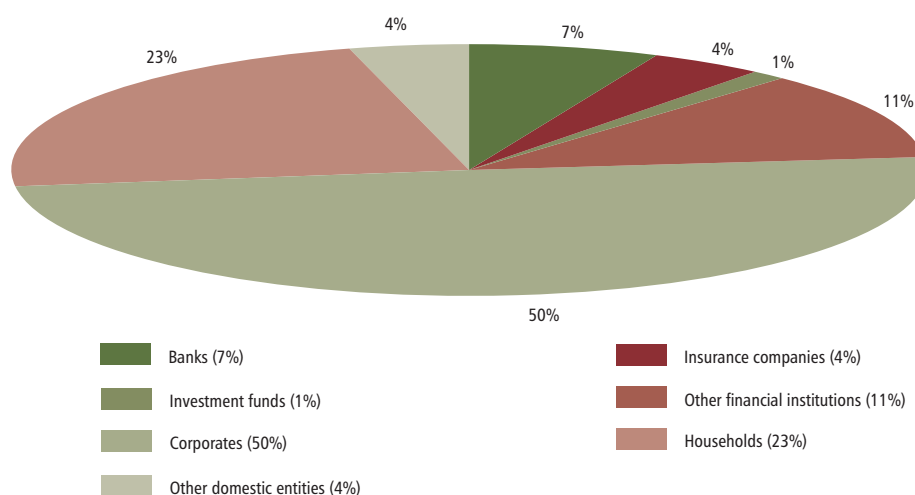
#### *The depository and settlement system*

There is no central register of bank debt instruments. According to Article 90, paragraph 4 of the Banking Law, the issuing bank performs the depository functions for certificates of deposit in the dematerialized form. In practice, the certificates of deposit are usually in the material form and are held in custody by other banks. In case of dematerialized securities, the issuing bank is the depository for securities.

### **Investors**

Households were the dominant investors purchasing certificates of deposit in 2000-2001 (Figure 17). Foreign investors did not show much interest in purchasing bank securities. This results from a limited size of the issue, the limitations of the Foreign Exchange Law and low liquidity of the market.

**Figure 17. Investors in the certificates of deposit market in 2001**



Source: Reports of money market dealer banks and applicants for the function.

### Market liquidity

Information regarding the size of the turnover in the secondary market is not available. The small size of issues leads to assumption, that the scale of trading is small.

## 2.4. Repo and sell–buy–back transactions

### Basic characteristics of the instrument

There are the two basic types of conditional transactions: *repurchase agreements (repo)* and *sell-buy-back* and *buy-sell-back (SBB/BSB)* operations.

Repo and SBB/BSB are transactions where one of the parties sells securities, simultaneously agreeing to repurchase the securities at an agreed price<sup>8</sup> and on a date specified in the agreement. The fundamental difference between repo and SBB is that the former is based on one agreement, while the latter on the two agreements (sale of securities in spot market and purchase of securities in forward market).

### Box 3

#### STANDARDIZATION OF THE REPO TRANSACTION

The development of the repo market is determined not only by economic conditions, but also by regulations imposed on the market. Particularly adverse influence on the development of the market was exerted by the lack of a uniform regulations on a default by one of the parties. Therefore, the Polish Banks Association developed a general framework for repo agreement.

In 2000 a general repo agreement was prepared in cooperation with the NBP:

- "Interbank agreement on the repo transaction on the Treasury bills of the Ministry of Finance and National Bank of Poland money market bills executed on the Polish interbank market",
- "General conditions of the interbank repo agreement on Treasury bills of the Ministry of Finance and on the National Bank of Poland money market bills".

The purpose of these documents was to limit the risks associated with repo transaction by implementing uniform conditions of the delivery of securities, confirmation of transaction, payment, rules for compensation for price differential, and determination of the sanctions for a default of a party on the conditions of the framework agreement and particular repo transaction. Due to the lack of acceptance from some of the banks, the documents did not become effective.

In result, a document of a different nature was developed, i.e. "Recommendation on the execution of repo and sell-buy-back transactions", which included both Treasury bills and money market bills transactions as well as Treasury bonds. The list of instruments included in the practice may be extended by introduction of new annexes. This document was adopted by the Management Board of the Polish Banks Association during a meeting on November 9, 2001.

<sup>8</sup> The repurchase price shall be higher than the sale price paid by the buyer since it will also cover the so called *repo* rate. The *repo* rate is expressed as a percentage difference between the price of the repurchase and sale, with the consideration of term of the transaction divided by the number of days in a year (i.e. 365).

Repo and SBB can be treated as collateralized deposits. The deposits obtained in the repo market are subject to mandatory reserve requirement (with the exceptions specified in the Law on the NBP). No such requirement applies for SBB. For these reasons, repo is used mainly to obtain funds in the interbank market, while the SBB operation is used by banks in transactions with non-bank institutions. Repo transactions allow for an alleviation of limitations resulting from credit ceilings set between banks.

Interest on such transactions is negotiable according to WIBID and WIBOR<sup>9</sup> rates, and yields are calculated on a 365-day basis.

Repos and SBB are short-term operations. A majority of operations (80-90% in the case of SBB and over 90% in case of repo) are operations with maturities less than 7 days. The remainder are transactions executed for periods of up to 1 month.

An average value of a repo and SBB transaction depends on the type of entity, with which a transaction is executed. In case of repo it amounted to PLN 96 million in 2001, and in case of SBB to 118 million. The transactions executed with non-bank entities did not exceed PLN 5-7 million.

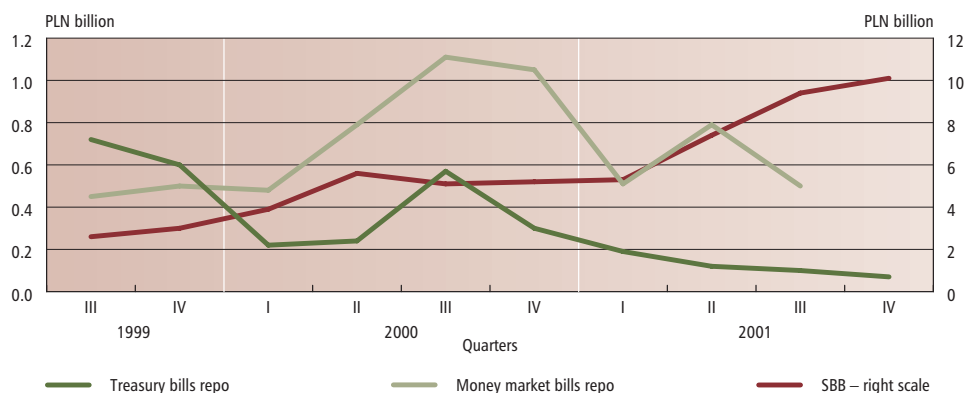
### Market size

In contrast to the majority of markets, the balances of repo/SBB operations reported by banks at the end of the month do not reflect correctly the size of the market. Banks avoid leaving open positions at the end of the month due to possible differences in accounting between deposit registers and cash accounting of banks. The size of the operations during the month is much higher than the reported size at the end of the month. The size of the repo/SBB market is much better characterized by the volume of turnover than by the balance of transactions registered by banks. Information about the volume of turnover are presented in the subparagraph regarding the liquidity of the market. Here, we must base on the end of month balances, since we do not have information about the balances during the month.

Repo market size (measured by the balance of operations) reached in the third quarter of 2000 the value of PLN 0.6 billion for Treasury bills and PLN 1.1 billion for money market bills. During the entire year 2001, the market size of the repo market was systematically declining. At the same time the balances of SBB market were increasing. The average market size in the fourth quarter of 2000 reached PLN 5 billion and it increased to PLN 10 billion in the fourth quarter of 2001.

The decreasing size of the repo market resulted from decreasing issue of money market bills, which constitute the main collateral used by banks. Another reason was an increased attractiveness of the synthetic deposit market (fx swaps). The scale of transactions in repo and SBB market (measured by quarterly averages) is presented in Figure 18.

**Figure 18. Repo and SBB market - transactions outstanding (end of period)**



Source: CRTB data and reports of money market dealer banks and applicants for the function.

<sup>9</sup> More broadly discussed in the chapter on interbank deposits, Box 3.



### *Market organization*

In the analyzed period, there were the money market instruments, which mainly used in repo and SBB transactions, while the use of Treasury bonds was small. This resulted from the fact, that the transactions secured by Treasury bills and NBP bills are settled in the Central Register of Treasury bills and Register of Money Market bills in real time, and the NBP collects very low transaction fees (PLN 4.0 per transaction independently of the settlement amount). In case of repo and SBB transactions with the use of Treasury bonds, the development of the market was difficult due to the binding settlement procedures in the NDS, and due to the size and structure of transaction fees. A limited ability to settle the transaction on trade date is an additional factor limiting the attractiveness of repos on T-bonds.

Mainly the NBP bills were used as collateral in the repo transactions. In 1998-2001, such transactions constituted 80-90% of the trade in repo market. The SBB (BSB) transactions were in turn conducted almost exclusively with the use of Treasury bills. In 1999-2000, SBB transactions on Treasury bills represented approximately 99% of the total trade in the SBB market.

The average share of the SBB transactions secured by Treasury bills in the total turnover of the secondary market for Treasury bills reached 83% in 2001. The average share of the repo transactions secured by money market bills in the total turnover of the secondary market of the NBP money market bills reached 28% in 2001.

### *Investors*

Mainly the domestic banks participated in the repo market. This resulted from the fact, that, based on the resolution of the NBP Management Board<sup>10</sup>, the NBP bills are available only for banks (with the exception of the Bank Guarantee Fund). The share of the institutions in the total turnover of the repo market in 1998-2001 exceeded 99%.

The SBB transactions were executed between banks and with non-bank entities. The share of the interbank operations was declining and reached 53% of turnover at the end of 2001. The first SBB transactions with foreign entities were executed in the beginning of 2000.

### *Market liquidity*

#### *Gross turnover*

While the value of turnover on the SBB market was displaying a constant growing trend (from PLN 110 billion in 1999 to PLN 878 billion in 2001), the repo market turnover declined to PLN 86 billion in 2001, after the initial growth from PLN 89 billion in 1998 to PLN 225 billion in 2000. Turnover in the SBB market increased by 699% between 1999 and 2001. At the same time, the turnover in the repo market increased by 154% in the period of 1998-2000, to decline by 62% in 2001. The reason for the decline is that the repo transactions were secured almost solely by the NBP money market bills and there was a decline in their issue in 2001. The decreasing scale in the trade resulted also from the exclusion of repo transactions from the criteria covered by Dealer Activity Index. The trade in both markets is presented in Figure 19.

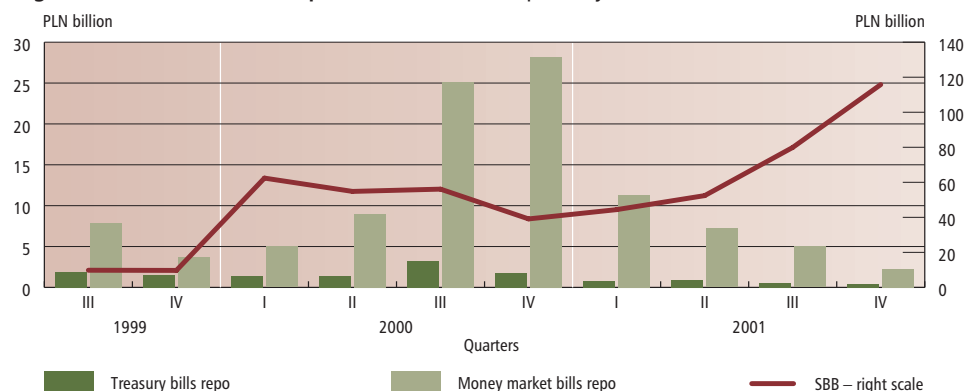
Quarterly values of the liquidity indicator for the repo transactions in 2001 ranged between: 4.3 and 7.2 for transactions secured by Treasury bills, and between 9.1 and 22.4 for transactions secured by the NBP bills.

The quarterly values of the liquidity indicators for the SBB market and for the market for repo market declined in 2001. The levels of liquidity indicators of the market for repos on Treasury bills remained unchanged.

Among the fundamental barriers to the development of the market for deposits secured by securities were legal issues. To stimulate the development of the deposit market, "Recommendations regarding the execution of repo and SBB transactions" were introduced in 1999. This document was

<sup>10</sup> Resolution of the NBP Management of November 24, 2000, Official Journal of the NBP no 15, item 28.

Figure 19. Turnover in the repo and SBB market (quarterly)



Source: CRTB data and reports of money market dealer banks and applicants for the function.

approved by the Polish Banks Association in 2001 (see Box 3). Another impediment to the development of the market is the mandatory reserve requirement concerning the funds obtained in the repo market, which results from Article 38 of the Law on the NBP. Considering the need to harmonize Polish legislation with the provisions in force in the European Union, this provision may soon be changed (in the ECB, the mandatory reserve requirement rate for repo operations is equal to zero).

A psychological barrier to the development of the repo market is the fact, that the domestic banks are not used to a situation (which is also common in other countries), in which the legal consequences of a repo transactions are different than the economic consequences. This difference is reflected in the entries on the accounts of a given entity in the depository system and in the balance sheet of the entity. The Central Register of Treasury bills (according to the legal status of a repo transaction) **transfers ownership rights of the securities between the counterparties**. As a result, the CRTB rules for recording securities reflect the actual legal status of a repo transaction. The economic results (i.e. tax, accounting results) of a repo transactions are identical as in case of a cash loan (deposit) secured by securities. The public law interferes in this case with the "sphere of internal financial organization of a bank" by establishing a minister responsible for public finance, after consulting the opinion of Commission for Banking Supervision, of rules of presenting particular operations in the banks balance sheets<sup>11</sup>. However, this is not an interference with the reading of the agreement, since the accounting instruction cannot determine the nature of legal action. In the standard of the Bank Chart of Accounts the solution was adopted, in accord with the European accounting standards<sup>12</sup>, that the securities which are subject to a repo transaction **remain in the balance sheet of the selling bank**. Therefore, the repo transaction does not cause a change in the balances of securities in the selling bank's books on the account "securities which do not represent an equity stake in capital". The liability from the repurchase is recorded by the seller on the credit side of the account "Sale of securities with a repurchase promise granted". The change of the balances on the account may occur when one of the parties defaults on the repurchase obligation.

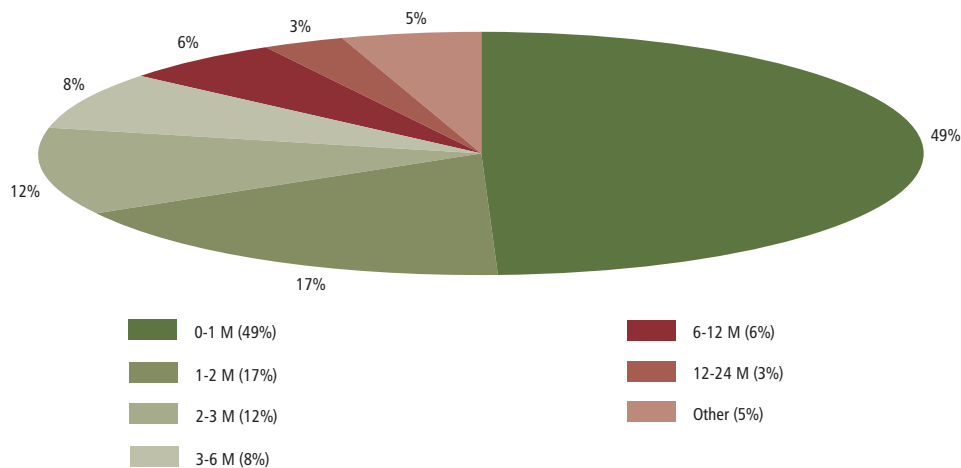
#### Yields

In 2000 and 2001, the average monthly yields in the repo market were, on average, 1 percentage point below the average monthly WIBOR. The NBP does not have data on yields in SBB market. Considering the fact, that a SBB is in fact a type of repo transaction, one can assume, that yields on such operations were similar as in the case of repo transaction.

<sup>11</sup> Ordinance of the Minister of Finance of December 12, 2001 on the establishment of Banks chart of account (Journal of Laws no 152, item 1727).

<sup>12</sup> Accounting procedures of repo operations in a bank balance sheet are set by the Directive of December 8, 1986, on the rules of preparation of annual financial statements and consolidated statements by banks and other financial institutions – 86/635/EEC (OJ L 372.12.1996).

Figure 20. Term structure of interbank deposits (end of 2001)



Source: NBP data.

## 2.5. Interbank deposits

### *Basic characteristics of the instrument*

Interbank deposits are the key instrument for liquidity management in banks. Transactions in interbank market are based on Article 49 and 50 of the Banking Law. In the interbank market banks

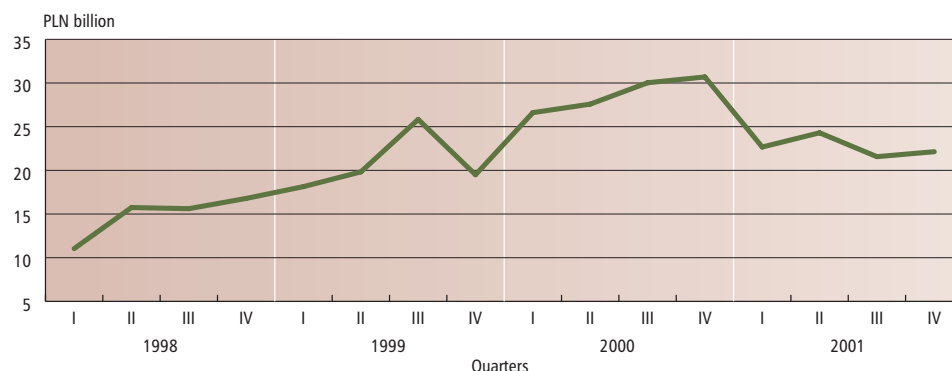
### Box 4

## WIBOR AND WIBID RATES

The average interest rates in interbank deposit market are WIBOR/WIBID. They provide also the reference point for settlements in the derivatives market (FRA, IRS). The system of WIBOR rates fixing is used since 1991. The first institution, which attempted to develop such a system was the Polish Development Bank S.A. (Polski Bank Rozwoju SA – PBR SA). The current organizer of the fixing is the Polish Association of Bank Dealers “Forex Poland”.

In 1998-2000, 15 money market dealer banks were participating in the process of setting WIBOR rates. The banks were obliged to quote rates for the deposits accepted by them with the following maturities: T/N, 1 week, 1 month, 3 months, 6 months. Two outliers from among the quotes were rejected and an arithmetic mean of the remaining rates was calculated. The technical service of the system was provided by Reuters (WIBOR page). During the first 10 minutes after the fixing, banks are obliged to enter transactions at the quoted rates.

On January 1, 2001, the new fixing rules became effective, which allowed for the participation of 10 domestic banks or branches of foreign banks. The reference WIBOR rates are set for the following maturities: O/N, T/N, SW, 1 month, 3, 6, 9 and 12 months (permitted spreads range between 0.5% and 0.75%). WIBOR (or WIBID) rate is calculated as the arithmetic mean of the rates quoted by the participants, after rejecting two outliers (the highest and lowest quote). Fixing is not performed if less than 5 banks deliver their quotes.

**Figure 21. Interbank deposits outstanding**

Source: NBP data.

are borrowing funds held with central bank. Interbank deposits are not collateralized. Thus they bear relatively high credit risk. As a result, bank management boards impose limits on operations in depo market.

Although the interbank deposits were used since the end of the 1980s, only after the consolidation of the bank accounts in the Headquarters of the NBP in 1993, did a nationwide market emerge.

In 1998-2001, 45.7% of interbank deposits had maturities up to 1 month and 59.6% of deposits had maturities of up to 2 months. The share of deposits with maturities longer than 12 months varied from 2.8% (in December 2000) to 32.2% (in December 1999) of the total. Long-term deposits were made mainly in banks affiliated with the lending banks. The term structure of the interbank deposits is presented in Figure 20.

The average annual value of a single transaction in the interbank deposit market increased from PLN 24 million in 1998 to PLN 49 million in 2001<sup>13</sup>.

#### **Market size**

Value of funds placed in the interbank deposit market was constantly growing: from PLN 11.1 billion in January 1998 to PLN 22.1 billion in December 2001. The highest level of funds borrowed in the interbank market in the analyzed period (PLN 33.1 billion) was recorded in October 2000. The decline in the value of funds borrowed in the interbank deposit market in 2001 was partly a result of the PKO BP SA transaction with the central bank, under which PKO BP SA invested PLN 7.5 billion in the 91-day NBP bills. The declining scale of the trade in the depo market influenced also the repo market, the sell-buy-back market and the fx swap market.

#### **Market organization**

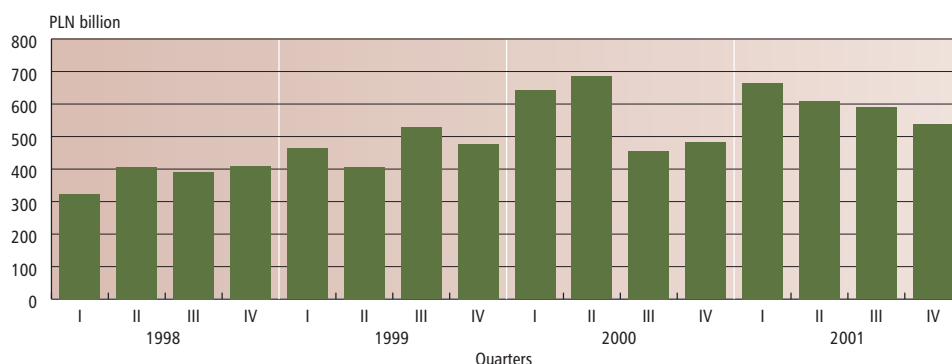
Mainly the domestic banks are participants in the market, since only domestic banks hold accounts with the NBP.

#### **Market liquidity**

##### *Gross turnover*

The scale of the trade in the depo market was gradually growing (Figure 22). The average monthly gross turnover increased from PLN 346.9 billion in 1998 to PLN 623.6 billion in 2001 (the highest level of turnover, PLN 719.8 billion, was recorded in July 2001).

<sup>13</sup> Gross value of turnover was used for the purposes of calculation of the value of transactions in a given month and the annual average.

**Figure 22. Turnover in the interbank deposit market**

Source: NBP data.

*The ratio of the gross turnover to the stock of the deposits*

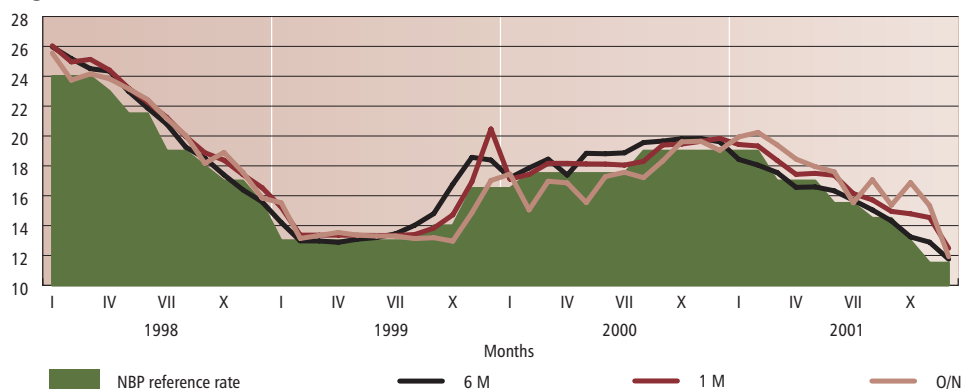
As compared with other markets, the liquidity indicators in the interbank depo are very high. This results mainly from the above mentioned dominance of O/N transactions in the term structure. In reality, the importance of the interbank depo market is declining in relative terms. This is caused by the process of consolidation in the domestic banking system, and also by the increase in the use of repo and fx swaps in the banks liquidity management. Such operations allow to circumvent the barrier of credit limits, which is present in the interbank market. The restrictive credit limits in the depo market result from provisions of the Bankruptcy Law, which does not allow netting in Poland.

*Spreads*

The continued shrinking of spreads in the interbank market reflects the improving liquidity of the market.

*Interest rates*

The average level of interest rates in the depo market is reflected by WIBOR and WIBID (see Box 4). Volatility of the interest rates in the depo market reflects the changes in the liquidity of banks, which results mainly from flows of funds on the accounts of the government and NBP operations. In case of deposits with longer maturities (over 3 months), the changes in expectations regarding the future levels of interest rates are an important factor. O/N interest rates are the most volatile rates. The largest changes in the O/N rates usually take place in the period of settlement of balances of the mandatory reserves, when banks know if they have an excess or a shortage of required funds. In the first case the overnight rates decline, in the second case market rates increase

**Figure 23. WIBOR and NBP reference rate**

Source: NBP data and Reuters service.

to the level of the NBP lombard rate, at which banks may borrow from the NBP. Periodically, inter-bank market rates increased slightly above the NBP rate. This occurred, when there were banks, which did not have enough collateral and had to borrow from other banks still having access to lombard credit.

The rates on longer-term deposits behaved differently. 1-month WIBOR rate was relatively stable and it stayed slightly above the NBP reference rate.

The interbank depo market is liquid up to 1-month instruments.

WIBOR rates and the NBP reference rate are presented in Figure 23.

## 2.6. Foreign exchange swaps

### *Basic characteristics of the instrument*

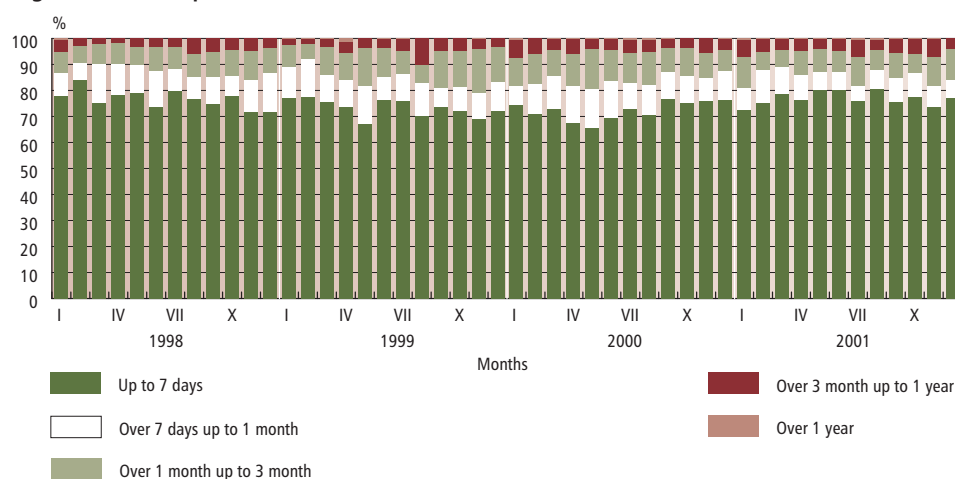
Fx swap is a purchase of the zlotys with foreign currencies in the market and a simultaneous repurchase of the foreign currencies in forward transaction. The buyer of the zlotys in the spot transaction is in fact swapping foreign exchange loan into zloty short-term loan. The buyer of the foreign currency in the spot transaction is swapping zloty deposit into foreign exchange deposit. In both cases the level of interest reflects the difference between spot and forward exchange rate.

The swap market has been developing in Poland since 1999, after the introduction of the Foreign Exchange Law of December 18, 1998, which made Polish zloty externally convertible..

A rapid development of the swap market results from the number of uses of the instrument, which:

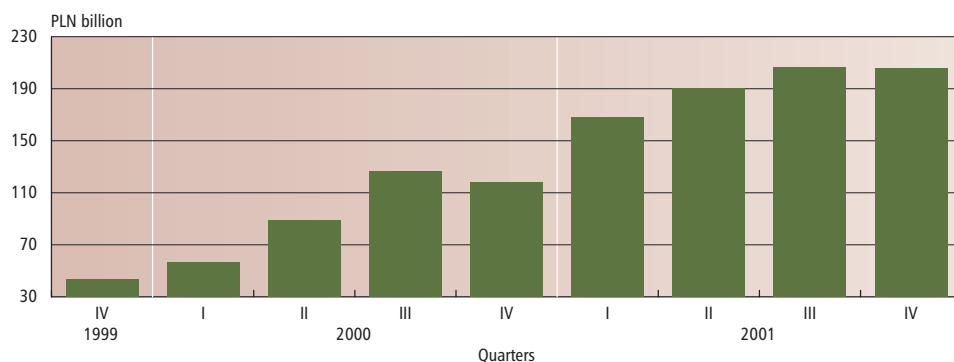
- offers short-term zloty financing for foreign bond traders,
- enables speculations on the changes of interest rates and exchange rate<sup>14</sup>,
- offers hedge for issuers of FRA contracts.

**Figure 24. Fx swap market turnover structure**



Source: Reports of money market dealer banks and applicants for the function.

<sup>14</sup> A fx swap transaction gives a right to executed a forward transaction at a pre-determined exchange rate. Upon conclusion of the fx swap, its market value is equal to zero, since the difference between the spot and forward rates upon the transaction conclusion, reflects the difference in the interest rates in the two currencies. However, any change in the relationship of the interest rates or spot exchange rate will cause the market forward rate for a given date to deviate from the pre-arranged forward rate for fx swap the transaction. In this situation the conclusion of a reverse transaction for the same settlement date, may generate profits if the forward exchange rate deviated into a beneficial direction.

**Figure 25. Fx swap market (quarterly)**

Source: Monthly information from banks.

Fx swaps involving the zloty constituted 80% of the total volume of fx swaps in 2001<sup>15</sup>. In 88% of such transaction the second currency was the US dollar. The share of the euro was 4%<sup>16</sup>.

The data on the turnover structure shows, that approximately 75% of fx swaps have maturities up to 7 days (Figure 24).

In contrast to the depo market, which is liquid for transactions with maturities up to 1 month, the fx swap market is liquid for much longer maturities, up to 15 months.

The minimum size of a transaction in the fx swap market is the equivalent of approximately USD 10 million.

#### **Market size**

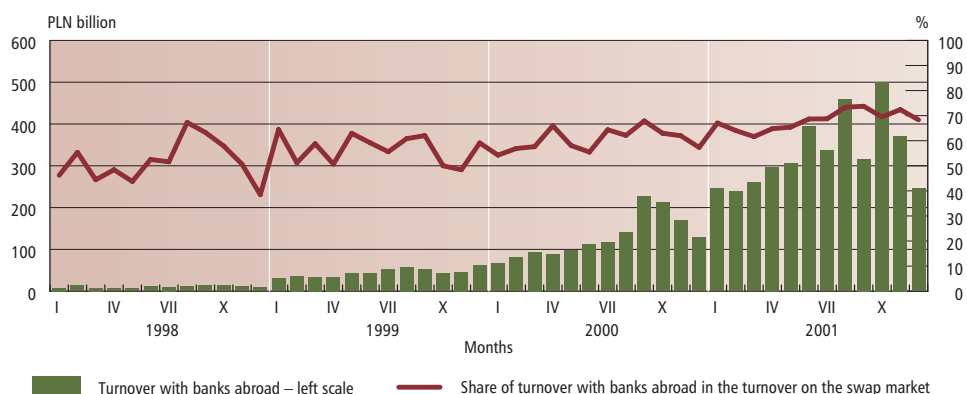
The stock of bought and sold fx swaps increased from PLN 43 billion in December 1999 to PLN 206 billion in December 2001, or four times (Figure 25).

#### **Market organization**

Fx swap market is a segment of unregulated interbank market.

#### **Market participants**

The NBP does not have data, which would allow to identify the most active participants in the market. Information obtained indicates that there is a group of 3 to 5 domestic banks, which

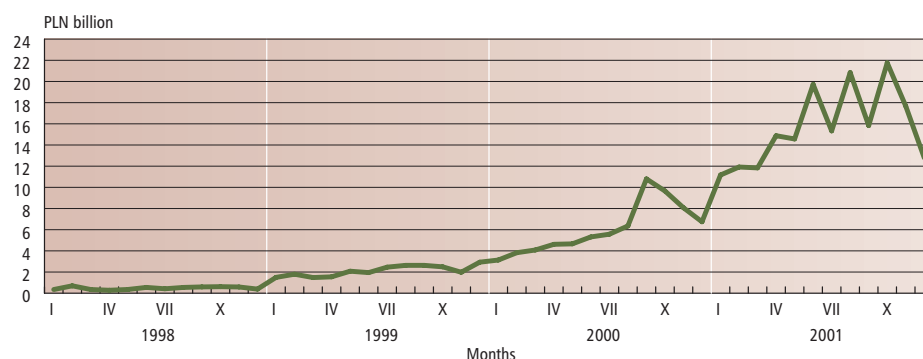
**Figure 26. Turnover in the fx swap market in 1998-2001 (transactions foreign currency – PLN)**

Source: Reports of money market dealer banks and applicants for the function.

<sup>15</sup> Based on the data from money market dealer banks.

<sup>16</sup> In absence of data for 1998-2000, the quoted average concerns the 12 months of 2001.

**Figure 27. Daily average turnover of foreign banks in the fx swap market (PLN – foreign currency)**



Source: Reports of money market dealer banks and applicants for the function.

are particularly active. An important role is played by foreign banks operating from London and Frankfurt. These banks perform the functions of intermediaries (swap-houses) in the fx swap market. The operations of these banks with Polish banks are associated with their core transactions and with hedging customers transactions.

The 67-80% share of non-residents in the trade in fx swap market illustrates the dominant role of foreign banks in the market (Figure 26). The average daily turnover with foreign entities in the fx swap market increased from PLN 348 million in January 1998 to PLN 12,789 million in December 2001, i.e. by 3,575% (Figure 27).

Investments in Poland create *long position* in zlotys in balance sheets of foreign investors, which exposes them to the risk related to a possible fall of the zloty. Therefore, foreign investors often use fx swaps to finance their investments in Poland to hedge themselves against exchange rate risk.

On the other hand, due to the large interest rate differential, foreign investors were using fx swaps to speculate in the foreign exchange market. Using the combination of spot transaction and fx swap investor can engineer synthetic outright forward. Such speculation offers profits when the zloty does not fall in the spot market below the initial level of the forward rate.

#### **Market liquidity**

##### **Gross turnover<sup>17</sup>**

In the analyzed period, the volume of gross turnover in the fx swap market increased more than 23 times, from PLN 68.7 billion in the fourth quarter of 1998 to 1,592.9 billion in the fourth quarter of 2001 (Figure 28).

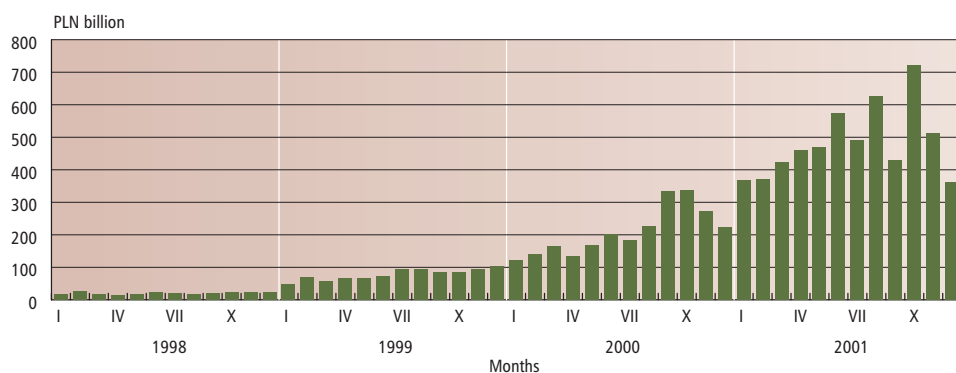
Such a dynamic growth of trade was caused mostly by the increased demand from foreign banks and their customers.

The factor, which also stimulated the development of the fx swap market was the introduction in November 1999 by the Polish Banks Association and the Polish Association of Bank Dealers "Forex Poland" of a standardized agreement for fx swap transactions, which was similar to ISDA (International Swap and Derivatives Associations) agreement.

<sup>17</sup> Turnover is double counted for money market dealer banks, but in the case of transaction between a domestic bank or a foreign bank, which is not a dealer, such transaction is single counted.



**Figure 28. Turnover in the fx swap market**  
(transactions with the use of PLN)

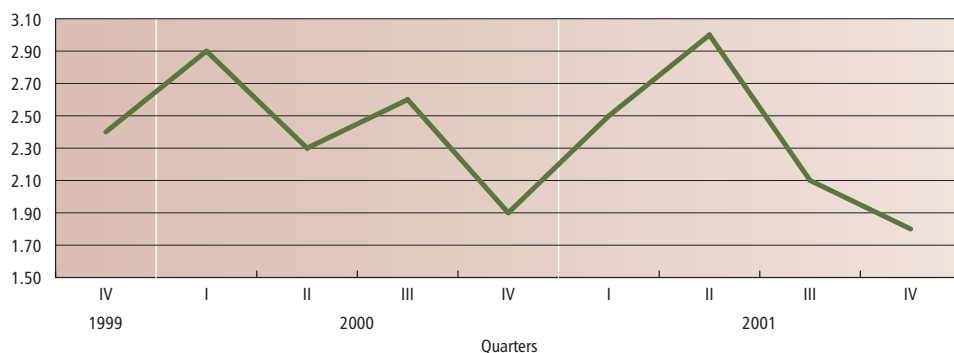


Source: Reports of money market dealer banks and applicants for the function.

### *The ratio of gross turnover to the total stock*

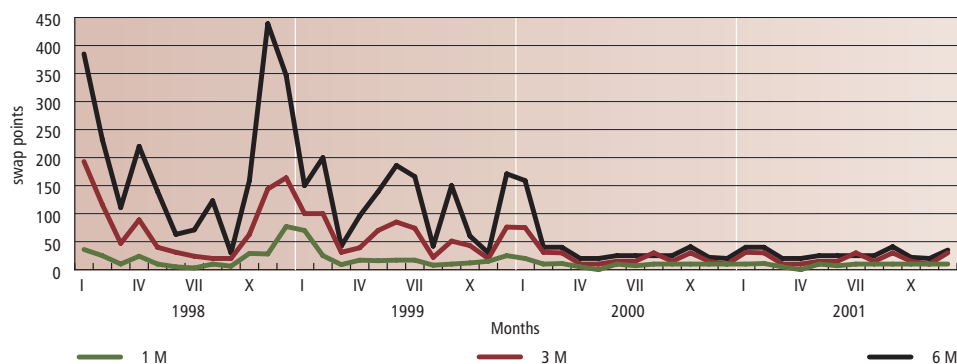
The analysis of the ratio of the gross turnover and the stock of fx swaps shows large changes in the liquidity of the market. In 2001, the described ratio was falling (Figure 29). It does not necessarily mean a decline in the liquidity of the market. A more probable is that it was caused by lengthening of the average term to maturity of swap contracts and the increasing utilization of such transactions as hedging instruments.

**Figure 29. Fx swap market liquidity (as of the end of quarter)**

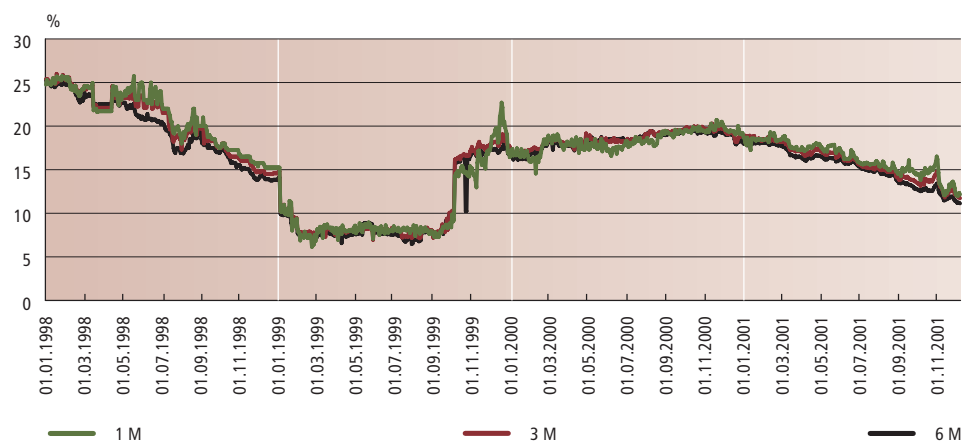


Source: Reports of dealer banks and applicants for the function.

**Figure 30. Price spreads in the fx swap market**



Source: Reuters.

**Figure 31. Interest rates in the fx swap market**

Source: Reuters.

*Price spreads*

Such explanation is confirmed by the decrease in spreads for 1-, 3-, and 6-month contracts in 2000-2001 (Figure 30).

*Yields*

Interest rates in fx swap market are presented in Figure 31.

## 3

### Capital market

In capital market are traded stocks and debt instruments with maturities exceeding 1 year.

#### 3.1. Treasury bonds

##### *Basic characteristics of the instrument*

Treasury bonds are debt instruments with maturities exceeding 1 year, which are issued by the State Treasury represented by the Ministry of Finance.

The Ministry of Finance issues so called *active* bonds (traded in the secondary market) and so called *passive* bonds (which are not traded in the secondary market). Active bonds include securities with maturities of: 1, 2, 3, 5 and 10 years, while the passive bonds include, among others, the restructuring bonds, conversion bonds and bonds denominated in USD. Additionally, the Ministry of Finance issues savings bonds with maturities from 2 to 4 years.

The active bonds are fixed rate bonds (with 2, 5 and 10-years term to maturity) and floating rate bonds (with 1, 3 and 10-year term to maturity). The interest income is offered in the form of discount or coupon payments (payable as a percentage of the par value every 3 months or annually, depending on the type of bonds). In case of zero-coupon bonds (with 2-year term to maturity), the investor realizes the income as a difference between the purchase price and the redemption price of the security.

#### Box 5

### STRATEGY FOR THE PUBLIC SECTOR DEBT MANAGEMENT

The *Strategy for the public debt management* is a document prepared by the Ministry of Finance for 3-year periods. It sets the goals and the instruments for the realization of the goals adopted for management of public debt in the 3 and 10-year perspective. The goals of the *Strategy* are derived from the Law on public finance. The *Strategy* sets eight basic goals:

- to minimize cost of the debt service,
- to limit the exchange rate risk and the risk of foreign currency refinancing,
- to limit the risk of domestic currency refinancing,
- to limit the interest rate risk,
- to diversify the public debt,
- to limit the scale of monetization of the debt,
- to optimize the repayment program for the foreign debt repayment scheduled for particular year,
- to optimize liquidity management.

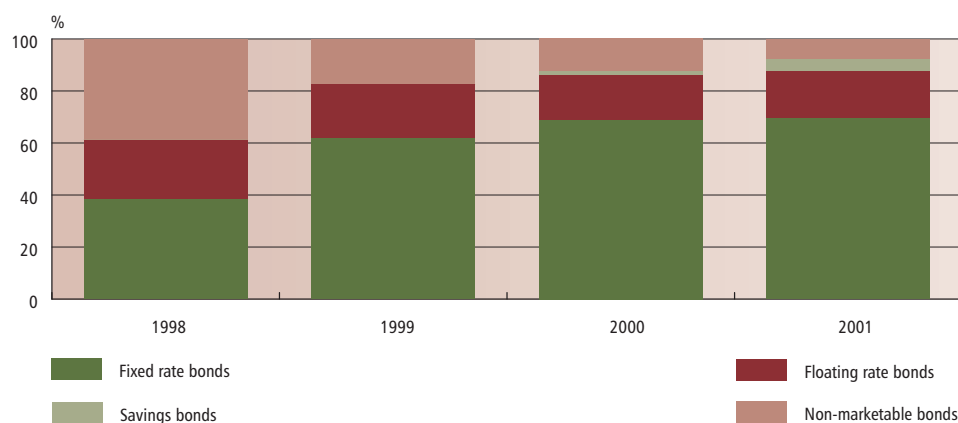
Depending on the type of the investor, to whom the issue is directed, Treasury bonds may be classified as *retail bonds*, dedicated for individual investors, and *wholesale bonds*, dedicated for domestic and foreign institutional investors.

Yields are calculated on a 365 or 360-day basis<sup>18</sup>. Par value of a bond is equal to PLN 100 or PLN 1,000, depending on the type of the issue and its tranche.

### Market size

The Treasury bonds market displayed a systematic growth, which was assumed in the *Strategy of public debt management* (see Box 5) published in 1999.

**Figure 32. Structure of outstanding T-bonds**



Source: Ministry of Finance data.

**Table 2. The stock of T-bonds (the end of 2001)**

Type of bond	PLN million
Active bonds	129,532.7
Fixed rate bonds	97,526.1
– 2-year, zero-coupon bonds (OK)	21,973.8
– 5-year (OS + PS)	51,935.9
– 10-year (DS)	9,049.5
– conversion bonds for NBP (TK, CK, PK, DK, KO)	14,182.1
– 5-year retail (SP)	384.8
Floating rate bonds	25,948.3
– 3-year retail (TZ)	8,061.5
– 10-year (DZ)	9,356.1
– denominated in USD of 2001	8,530.7
Savings bonds	6,058.3
– 2-year fixed rate (DOS)	5,168.7
– 4-year fixed rate (COI)	889.6
Passive bonds	11,300.2
– restructuring bonds	6,148.0
– bonds targeted to increase BGZs own funds	795.2
– denominated in the USD of 1991	4,357.0
Total	140,832.9

Source: Ministry of Finance data.

<sup>18</sup> The following interest calculation conventions are used on the Treasury securities market - *actual/actual* for fixed coupon bonds, *actual/360* for variable rate bonds payable quarterly and *actual/365* for variable rate bonds payable annually.

The government debt in the form of bonds grew in nominal terms from PLN 71.8 billion in January 1998 to PLN 140.8 billion in December 2001. The share of active bonds in the total issue increased from 39% to 88% (Figure 32).

### **Market organization**

#### *Primary market*

Bonds may be issued during an auction, through the retail points of sale (POS), and through the securitisation of the public debt. Active bonds, which are traded in the secondary market are sold during auctions. POSs sell retail and savings bonds. The issue of bonds may be a result of a conversion of the public sector debt into the government paper.

The conversion of the liabilities of the Treasury against the NBP into T-bonds was conducted in 1999, and the securitisation of a part of the debt of the healthcare system was conducted in 2000. The conversion of the government debt against the NBP aimed at allowing the NBP to absorb the excessive liquidity of the banking system through the sale of these papers. The government debt against the NBP was converted into zero-coupon bonds and fixed rate bonds (with maturity from 2 to 10 years).

#### **Box 6**

### **CONVERSION OF THE LIABILITIES OF THE STATE TREASURY TO NBP INTO TREASURY SECURITIES**

On July 19, 1999, the National Bank of Poland and the Ministry of Finance reached an agreement on conversion of a part of the State Treasury debt against the NBP into Treasury Securities.

The conversion included most of the non-marketable liabilities of the State Treasury towards the NBP. As of June 30, 1999, their value reached PLN 15.045 billion and they comprised long term State Treasury liabilities from:

- conversion bonds of 1993 (PLN 1.889 billion),
- settlement units purchased in and after 1990 by Bank Handlowy in Warsaw and subsequently bought back by the NBP (PLN 1.739 billion),
- bonds issued in 1997 to buy back Brady Bonds (PLN 5.502 billion),
- bonds issued in 1998 to buy back Brady Bonds (PLN 2.860 billion),
- bonds issued in 1994 to allow for the implementation of the agreement with the London Club banks (PLN 3.055 billion).

Between September 30, 1999 and December 29, 1999, the following liabilities of the State Treasury were converted in the Treasury bonds:

- 1) zero-coupon bonds with maturity on April 29, 2002 (KO),
- 2) fixed rate (10.0%) with maturity date on December 22, 2002 (TK),
- 3) ) fixed rate (10.0%) with maturity date on April 22, 2003 (CK),
- 4) ) fixed rate (8.5%) with maturity date on July 22, 2004 (PK),
- 5) ) fixed rate (6.0%) with maturity date on August 22, 2009 (DK).

The total nominal value of the bonds received by the NBP from the Finance Ministry reached PLN 16.439 billion. The above mentioned bonds, the so called conversion bonds, are used by the NBP with outright open market operations of the NBP with the money market dealer banks, which are conducted to limit the overliquidity of the banking system. They are sold on auction, and could be bought by domestic entities only.

The primary T-bond market is organized in the form of auctions at the NBP, which plays a role of the Ministry of Finance agent. The participants of the auction place bids directly with the NBP on the day of the auction. The decision on the size of the supply in a given auction, and the decision on the acceptable minimum auction price is made by the Ministry of Finance. The sale is organized in American auction system. Bids with a price higher than the lowest acceptable auction price are realized in full, bids with price equal to the minimum acceptable auction price may be filled in full or in part (by reduction of the bid quantity). Only the entities meeting the requirements of the "Issue ordinance" may participate in auctions. The requirements are met by the direct participants of the NDS, who hold a deposit account with in the Depository. The number of direct participants, who participate in the auctions ranged between 15 and 40 in 1998-2001, with most of the participants being domestic banks.

Starting from May 1992, all issues of bonds are conducted in the dematerialized form, both for the institutional and individual investors. According to the Law on Public Finance from November 26, 1998, the Finance Minister determines the general conditions of the issue in an ordinance, while detailed conditions are presented in the issue letters, which are published in the nationwide press and on the internet pages of the Finance Ministry. The benefit of the procedure is the possibility of quick and flexible adjustment of the size of the issue and conditions of the issue to the financial markets situation. Until 1999, the timetables of issues were published quarterly. Starting from 2000, they cover 12 months, however, only the dates of the auctions and types of bonds offered for sale are published. Until October 2001, the size of a given offer was published a week before the auction. Currently, it is published 2 days in advance<sup>19</sup>.

Appropriate information is provided through Reuters (page PLMINFIN) and on the internet pages of the Ministry of Finance. Information about a planned auction is also published in the daily newspaper "Rzeczpospolita".

The provisions of the Law allow for a division of the market into issues directed to wholesale and retail investors.

#### *Secondary market*

The legal base for Polish T-bond market is the Law on Public Trading in Securities<sup>20</sup>, which is effective since January 1998.

T-bonds are traded mainly in the interbank market. Only a small proportion of bonds is traded in the domestic organized exchanges: the Warsaw Stock Exchange SA, CeTO and the Polish Financial Exchange SA ("PFE").

The shares of individual markets in the trade in bonds are presented in Table 3.

**Table 3. Shares of individual markets in the trade in bond market (in %)**

Year	Interbank market	WSE	CeTO	NBP open market operations' transactions
1998	92.5	6.4	1.1	—
1999	95.6	4.2	0.2	—
2000	97.6	1.8	0.1	0.5
2001	98.0	0.6	0.0	1.4

\* The first transactions were executed in September 2000.  
Source: „The NDS depository and settlement system” bulletin.

<sup>19</sup> Ordinance of the Finance Minister of October 25, 2001, changing the Ordinance of the Finance Minister of April 26, 1999, on the conditions of issuing Treasury bonds offered on auctions.

<sup>20</sup> Journal of Laws of October 3, 1997, with subsequent changes.

The main reasons for the concentration of trading in the unregulated market are:

- concentration of foreign investors activities in the unregulated market,
- relatively high fees of the WSE (stock exchange fees),
- mandatory intermediation of brokerage houses in bank transactions on the exchange market (in case of banks who are not direct participants of the stock exchange),
- poor transparency of prices in the interbank market, which allows banks to realize wider in operations with clients.

The main participants in the secondary bond market are both domestic and foreign banks. The typical size of a transaction is between PLN 5 and 10 million.

The introduction by the Ministry of Finance of large, standardized issues of bonds, so called *benchmark* issues, helped to improve the liquidity of the secondary bond market. Benchmark issues are for the most liquid securities traded in the secondary market. Both fixed and zero-coupon rate bonds issues of large sizes may potentially become benchmark issues. The Ministry of Finance decided that the benchmark issues must exceed PLN 2.5 billion of their nominal value. The benchmark status may be obtained also by the issues, which do not meet this criteria but the market participants attribute special importance to them (e.g. because of high probability that they will become large issues in the future). The first issue, which could be considered as benchmark, was an issue of 10-year fixed rate bonds, in 1999. The total value of the issue amounted PLN 3.3 billion. Before 1999, the average value of individual issues amounted to PLN 1.2 billion. This value increased to PLN 4.8 billion in 2001. Benchmark issues were mostly for 2 and 5-year fixed rate bonds. The largest issues conducted in the analyzed period were the issues of: 5-year PS0206 bond with the maturity date on February 12, 2006 (its nominal value reached PLN 5.4 billion) and a 2-year zero-coupon OK0803 bond with the maturity date on August 21, 2003 (and nominal value of PLN 6.5 billion).

The Ordinance of 1999 gave the Finance Minister a possibility to call the bonds before maturity. The organization of the repurchase auctions is also delegated to the National Bank of Poland.

In 2001, the Finance Ministry introduced a new debt management tool, the bond switching auctions. The switching operation is conducted through repurchasing the bonds of a given series before maturity. The payment instrument are bonds of other series. Thus, such transactions do not involve cash. In return for bonds which are being repurchased, investors receive bonds of benchmark issues, which increases the liquidity of the market. The first switching auction was conducted in November 20, 2001. There were 5 switching auctions organized in 2001, during which the Ministry of Finance repurchased PLN 661.99 millions of bonds and delivered PLN 706 million of bonds.

#### *The depository and settlement system*

Treasury bonds transactions are settled in the National Depository of Securities SA (see Box 7).

It is worth stressing that in the interbank market, part of the transactions was settled outside of the DVP mechanism (banks were delivering only the securities transfer instructions to the NDS, while the cash settlement was performed separately by banks, through their accounts in the NBP). The reason, why banks selected a less secure settlement mechanism were the fees collected by the NDS, which, in the opinion of banks, were too high.

The NDS fees were also an important barrier to the development of repo market, the existence of which is a prerequisite for the liquidity of the government paper market. In case of a conditional transaction, which consist of two transactions, the fee is paid twice by each of the counterparties, which increases the transaction costs significantly. Therefore, the market participants were demanding from the NDS to introduces separate procedures for the recording

## Box 7

3

## THE NATIONAL DEPOSITORY OF SECURITIES SA

The NDS was established in 1994, by the separation of the depository and settlement section of the Warsaw Stock Exchange and transformation of the section into a separate joint stock company. The fundamental tasks of the NDS include:

- safe-keeping of securities,
- settlement of transactions.

The NDS performs the depository and settlement functions in the regulated and unregulated market. The NDS settles transactions by transferring securities between depository accounts of participants and issuing money transfer orders for the amounts of net liabilities and receivables of participants between the bank accounts of participants in the settlement bank. Until July 1999 the function of the settlement bank was performed by Bank Slaski S.A. Starting from July 22, 1999, the NDS has an account in the NBP similarly to National Clearing House S.A. (KIR).

The NDS settlement system is a DVP system according to the second model, i.e. where cash settlement is performed on a net basis and securities settlement on a gross basis. The exception to this rule is the settlement of primary market auctions of Treasury bonds, where DVP model I is used, where the cash and securities settlement are performed on a gross basis.

and settlements of conditional transactions<sup>21</sup>. The NDS initiated recently a policy of reducing fees, to meet the requirements of the market participants (see Box 8).

Starting from 1998, work has been conducted on a new depository and settlement system, which shall be a RTGS system. The first step in the direction was the introduction on March 1, 2001, of new procedures of confirmation of transaction settlement conditions, called *Comparison*. The new procedures introduce a rule, that interbank market settlements are performed according to matching settlement instructions delivered by both parties of the settlement. This rule is implemented for transactions settled by a brokerage house and a custodian bank for clients account.

Also in 2001, multi batch daily settlement system was introduced:

- 3 settlement sessions starting from July 9, 2001,
- 5 sessions starting from September 3, 2001,
- 8 sessions starting from December 2001 (including 4 against payment sessions).

The most important benefits of introducing multiple settlement sessions include:

- lowering the cost of the so called *post-transaction* settlement (i.e. settlement between a brokerage house and a custodian),
- a possibility of executing multiple buy/sell transactions on the unregulated market during the same day,

<sup>21</sup> The Resolution of the NDS Management Board of January 29, 2002, introduced separate rules for *repo* and *sell- buy-back* transactions settlement. This allowed for the identification of such transactions on treasury bonds.



## Box 8

## SELECT CHANGES IN THE NDS FEE SCHEDULE IN 1998-2001

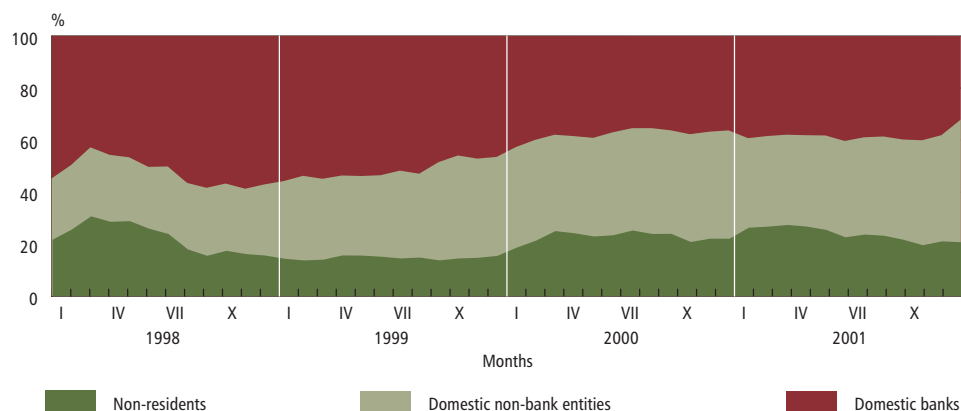
Type of fees	Legal status as of:	
	1.01.1998	9.07.2001
1 One time fees		
1.1 Fee for broadening of participation type	PLN 2,500	PLN 4,000
2 Annual fees		
2.1 Direct participation fee	PLN 3,000	PLN 4,000
2.2 Issuer participation fee	PLN 2,000	PLN 6,000
3 Quarterly fees		
3.1 Fee for the safe-keeping of securities	0.012% of market value	0.005% of market value
3.2 Fee for safe-keeping of securities other than shares	0.003% of market value	0.0008% of market value
4 Monthly fee for one book-entry operation on the regulated market	PLN 2.5	PLN 1.9
– with the value not exceeding PLN 100	–	PLN 0.5
– with the value not exceeding PLN 500	–	PLN 1.0
– with the value over PLN 500	–	PLN 1.9
5 One-time fees		
5.1 ISIN code fee	PLN 2,000	PLN 1,000
5.2 Dividend payment fee or an advance on dividend fee	1.8% of gross value of dividend, but not less than PLN 15,000	1,2% of gross value of dividend, but not less than PLN 2,000
6 Monthly settlement fees		
6.1 Fee from the value of settled transactions executed on the WSE and CeTO		
6.1.1 Equities	0.04%	0.013%
6.1.2 Securities issued by State Treasury – change in method of fee calculation	from 0.01% to 0.005% of the value depending on the number of transaction units	depending on the value of transactions – flat fee + from 0.0015% to 0.0005% of value
6.1.3 Other securities	0.02%	0.003%
7 Settlement Fund management fee	5% of the income value	4% of the income value
8 Fee for causing settlement suspension	PLN 100 for each day of shortage	PLN 500 for each day of shortage

- improvement in the efficiency of placing collateral in the form of securities for various types of transaction.

All these actions helped to increase the value of Treasury bonds turnover in 2001.

### *Investors*

After the Law on Public Finance was passed, the Ministry of Finance undertook efforts to divide the market into the segments of institutional investors and individual investors. The former

**Figure 33. Structure of the investors in T-bond market**

Source: Reports of money market dealer banks and applicants for the function.

purchased wholesale bonds, while the latter savings bonds and retail bonds distributed by the POS network. Individual investors were also active in the segment of wholesale bonds, although their share in the segment was relatively low.

The period of 1998-2001 was characterized by a growth of share of the non-bank domestic entities and non-residents in the turnover of the market, with a simultaneous decline in the share of the domestic banks (Figure 33).

Several factors were responsible for the emergence of such tendencies:

- the increase in the number of the non-bank institutional investors (insurance companies, pension funds and investment funds);
- a strong interest of foreign investors in the Polish bond market, which is currently the largest and the most liquid market in Central and Eastern Europe.

The non-residents were mostly interested in fixed rate bonds. In 2001, such bonds constituted approximately 99.9% of all bonds in the portfolios of foreign investors. The most popular were highly liquid 2-year zero-coupon bonds and 5-year bonds.

**Table 4. Structure of buyers of wholesale bonds in 1998-2001 (as of end of period, in %)**

Year	Non-residents	Non-bank entities	Domestic banks	Total (in PLN million)
1998	16	27	57	31,193
1999	15	38	46	42,615
2000	22	42	36	70,921
2001	21	47	32	92,815

Source: Reports of dealer banks and applicants for the function.

**Table 5. T-bonds in non-residents' portfolios (in nominal value, in PLN million)**

Year	T-bonds	Fixed rate bonds	Variable rate bonds
1998	1,280	4,645	228
1999	566	6,500	101
2000	656	15,654	7
2001	898	19,218	19

Source: Reports of dealer banks and applicants for the function.

### Development of the market

#### Gross turnover

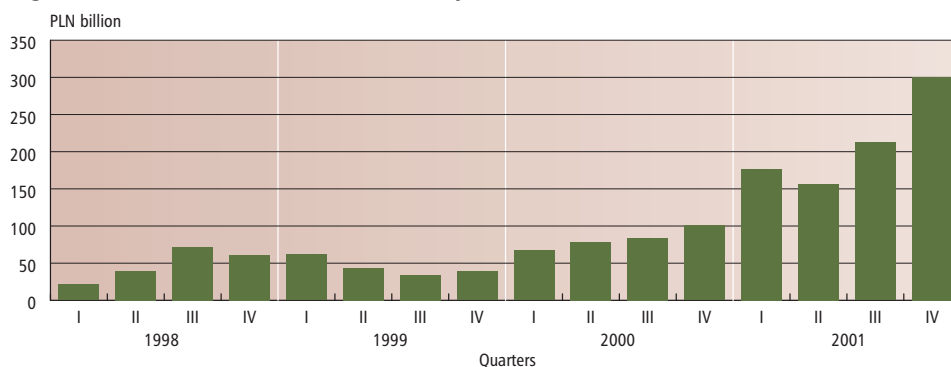
Average monthly gross turnover in the secondary bond market increased from PLN 16.1 billion in 1998 to PLN 71 billion in 2001 (Figure 34). The decline in the turnover noted in 1998 from PLN 192.9 billion to PLN 178.1 billion in 1999, was a consequence of the Russian crisis, a decline in the prices of bonds in the second half of 1999 and the difficulties, which were caused to the participants by the change in settlement procedures of the NDS.

In 1998-2000, the turnover in the bond market constituted around 20% of the total turnover of the Treasury securities market (i.e. Treasury bills and bonds). In 2001, the share increased to 45%. The improvement in the market liquidity was a result of several factors: creation of benchmark issues, the emergence of new class of investors (e.g. pension funds), the rising bonds prices and the changes in operating procedures and fee structure of the NDS. A factor, which could also affect the statistical increase in turnover, was the development of the sell-buy-back type of operations in T-bond market (these operations are not shown separately by the NDS system, so one such operation is recorded as two transactions on bonds: a purchase and a sale).

Further improvement in the liquidity of the T-bond market depends on the improvement in the transparency of the market. This should be assured, among others, by the bond price fixing system on the electronic trading platform (SPW), operated by the Central Table of Offers. The NBP is the supervisor of the fixing process and determines the rules of the fixing.

Starting from mid-2001, the Ministry of Finance has been conducting intensive work on the introduction of the system of Dealers of Treasury Securities (DSPW), the success of which will greatly depend on the effectiveness of the electronic Treasury Securities market. The main task of dealer banks will be to develop a liquid, transparent and efficient Treasury Securities market.

**Figure 34. Turnover in the T-bond secondary market**



Source: NDS data.

**Table 6. Annual gross turnover on the Treasury bonds market (in PLN billion)**

Year	Interbank market	WSE	CeTO	Transactions within the NBP open market operations	Total
1998	178.3	12.4	2.2	—	192.9
1999	170.3	7.4	0.5	—	178.2
2000	322.0	6.0	0.1	1.8	329.9
2001	835.5	5.1	0.0	5.8	846.4

Source: "The NDS depository and settlement system" bulletin.

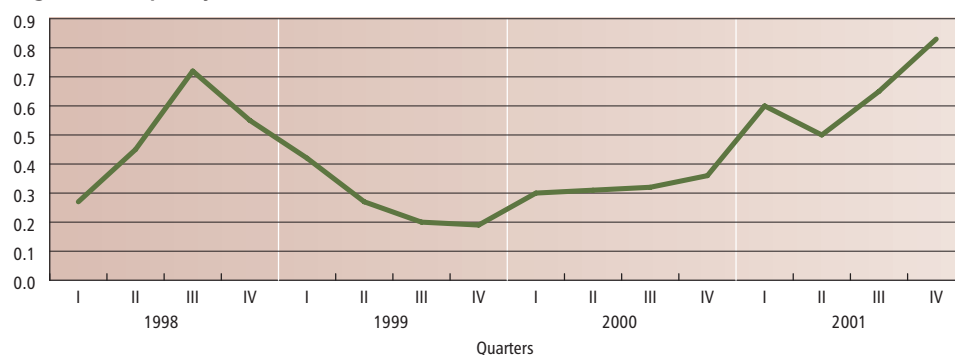
The changes in the market infrastructure will provide a positive stimulus to the development of the market. The NDS is implementing a new depository and settlement system, which, starting from August 2002, will allow for the settlement of transactions and transfers of bonds in real time (in an RTGS system). Moreover, the NDS lowers the safe-keeping and settlement fees imposed on the bond market participants. This policy is expected to continue and to contribute to the liquidity of the market. The preparation and the implementation by the NDS of the repo and sell-buy-back transactions settlement procedures should also become an important factor in the development of the market.

Growing activity of the non-bank financial institutions (particularly pension funds) will also provide an important stimulus to the development of the Treasury bonds market.

#### *The ratio of the turnover to the size of the issue*

The liquidity of the bond market measured by the ratio of the turnover to the value of the issue of bonds in circulation was declining until the third quarter of 1999, when it started to grow (Figure 35). The decrease of the liquidity indicator reflected a decrease in turnover caused by a change in accounting procedures of the NDS. The increase of the ratio could be associated, among others, with the transfer of the NDS settlement account from Bank Slaski to the NBP. This change accelerated the flows of funds and paved the way for transferring funds without the formal confirmation of transactions.

**Figure 35. Liquidity of the T-bond market**



Source: NBP estimates based on NDS and Ministry of Finance data.

### **3.1.1. Active bonds**

Active bonds, which are traded in the secondary market include fixed and floating rate bonds.

#### **3.1.1.1. Fixed rate bonds**

##### *Basic Characteristics of the instrument*

The types of fixed rate bonds issued by the Ministry of Finance between 1998 and 2001 are presented in Table 7.

Between 1998 and 2001, the share of active fixed rate bonds increased significantly. In 1998-2001, the size of the fixed rate bonds issue increased fivefold, and floating rate bonds only doubled.

The increase in the share of fixed rate bonds in 2000 was mainly the consequence of the conversion of the government debt against the NBP. The increase in the share of fixed rate bonds in 2001 was the result of the issue of USD denominated bonds (13.11.2001) in connection with the buy-back of the debt of the Republic of Poland against the Federal Republic of Brazil.

**Table 7. Fixed rate bonds**

1998	1999	2000	2001
1-year, offered in the retail network (RS) with coupons of 20.71% and 18%	1-year (RS) with coupons of 10.5% and 11% (only in a switch offer)		
2-year (OS) with coupons of 13% and 12%	2-year (OS) with coupons of 13% and 12%		
	2-year zero-coupon (OK) discount derived from auction price	2-year zero-coupon (OK) discount derived from the auction price	2-year zero-coupon (OK) discount derived from the auction price
5-year (OS) with coupons of 12% and 10%	5-year (PS) with coupons of 12%, 10% and 8.5%	5-year (PS) with coupon of 8.5%	5-year (PS) with coupon of 8.5%
			5-year* (SP) interest rate 9%
Assimilation bond (OS) to 2 and 5-year bonds	Assimilation bond (AS) to 2 and 5-year bonds		
	10-year (DS) with coupon of 6%	10-year (DS) with coupon of 6%	10-year (DS) with coupon of 6%
	Conversion bonds – see Box 8		

\* Retail bonds, issued for the first time in December 2001.

**Table 8. Share of fixed and floating rate bonds in the total supply of market bonds (as of the end of period; in %)**

Bond type	1998	1999	2000	2001
Fixed rate bonds	62.5	75	80	78.8
Floating rate bonds	37.5	25	20	21.2

Source: Ministry of Finance data.

### **Market organization**

#### **Primary market**

Fixed rate bonds are issued during auctions. The calendar of issues is set by the Ministry of Finance.

Auctions for 2 and 5-year bonds are conducted on the first Wednesday of the month, while auctions for 10-year bonds are organized every two months. The fixed rate 10-year bonds are sold one month and floating rate 10-year bonds sold the next month. Fixed rate bonds are auctioned on the third Wednesday of a month. The Ministry of Finance may organize additional auctions, depending on its borrowing requirements.

The sale of retail 5-year bonds is conducted by the POS, until the issue is exhausted.

#### **Secondary market**

A majority of transactions in bond markets is executed on the interbank market.

#### **Yields**

From July 1998 to January 1999 the prices of bonds were rising, which was associated with expectations on interest rates cuts by the NBP. Starting from February 1999, bond prices were systematically falling until December 2000, when they started to rise again. The lowest bond price level was recorded in mid October 2000. Since then bond prices were systematically rising, which was to a large degree a consequence of expected interest rate cuts (Figure 36).

**Figure 36. Yields in T-bond market**

Source: NBP estimates.

### 3.1.1.2. Floating rate bonds

#### Basic characteristics of the instrument

The types of floating rate bonds issued by the Ministry of Finance in 1998-2001 are presented in Table 9.

**Table 9. Floating rate bonds**

1998	1999	2000	2001
1-year, indexed, offered on auctions (RP) and in the retail network (IR); interest according to the inflation rate plus a discount resulting from auction or issue price	1-year, indexed, offered in the retail network (IR); interest according to inflation rate plus a discount resulting from auction or issue price		2-year, denominated in USD(DB) to finance buy-back of debt towards Brazil; interest according to LIBOR plus margin
3-year, floating, offered on auctions (TP) and in the retail network (TZ); interest 105% of the weighted average yield of 13-week T-bills plus discount resulting from auction or issue prices	3-year, floating, offered on auctions (TP) and in the retail network (TZ); interest 104% (TP) and 105% or 104% (TZ) of the weighted average yield on 13-week T-bills plus discount resulting from auction or issue price	3-year, floating, offered in the retail network (TZ); interest 104% or 100% of the weighted average yield on 13-week T-bills plus discount resulting from auction or issue price	3-year, floating, offered in the retail network (TZ); interest 100% or 95% of the weighted average yield on 13-week T-bills plus discount resulting from auction or issue price
10-year (DZ) interest according to the weighted average yield on 52-week T-bills plus 1 percentage point	10-year (DZ) interest according to the weighted average yield on 52-week T-bills plus 1 percentage point	10-year (DZ) interest according to the weighted average yield on 52-week T-bills plus 1 percentage point	10-year (DZ) interest according to the weighted average yield on 52-week T-bills plus 1 percentage point

The Ministry of Finance discontinued offering the 1-year indexed bonds in May 1999. In 2000, it discontinued the sale of 3-year bonds in auctions, leaving the entire distribution to the retail network.

The share of floating rate bonds in the composition of the government debt is gradually declining. They are issued due to a persisting demand, from individual investors. At the beginning of 1998, floating rate bonds comprised 43% of the value of active bonds issue. From June 1998 until August 1999, their share in the market was ranging between 35 and 37%, and it began to decline since September 1999.

A decreasing issue of floating rate bonds results from the assumptions of the *Strategy for the management of public debt* adopted by the Ministry of Finance. One of the main goal of the *Strategy* is to stabilize the cost of debt servicing. Therefore, the share of fixed rate Treasury Bond is increasing, while the share of floating rate bonds is declining. The experience of other countries point to the fact, that the fixed rate bonds should not constitute less than 2/3 of the value of government debt.

### **Market organization**

#### *Primary market*

The sale of wholesale, floating rate bonds is accomplished according to the procedure described in point 3.1. In 1998-2001, the scale and frequency of the issue of the bonds varied. In 1998, the Finance Ministry conducted 22 auctions of floating rate and 31 auctions of fixed rate bonds, while in 2001, only 6 auctions of floating rate bonds and 18 auctions of fixed rate bonds were organized. In 1998, 1-year, 3-year and 10-year bonds were issued with eight different maturity dates, while in 2000, only 10-year bonds were issued with one maturity date. Similarly in 2001, a new ten-year fixed rate bonds were offered, with one maturity date.

The sale of bonds directed to individual investors is conducted through the points of customer service. The agent and organizer of the issue is the Central Brokerage House of Bank Pekao SA. The payment of interest and redemption of the bonds is conducted in the place of purchase, in the form of cash payment or money transfer to the bank account. Individual investors may exchange their bonds into new bonds through subscription. The bonds, which are available to individual investors, may be held on account in any brokerage house.

#### *Secondary market*

Secondary trading in floating rate bonds is conducted both in the regulated and unregulated market. In contrast to the fixed rate bonds, the trading in the floating rate bonds concentrates on the stock exchange. Over 90% of the trading in the market is related to floating rate bonds. This shows that the WSE serves mostly individual investors, who are the main buyers of floating rate bonds. This is the result of not only smaller interest of institutional investors in floating rate bonds, but stems also from the limitations of the wholesale primary market, which only sells 10-year bonds. The declining share of institutional investors in this market is shown by Table 10.

**Table 10. Share of floating rate bonds in the total portfolio of investors**  
(as of end of period; in %)

Investors	1998	2001
Domestic banks	27	10.3
Domestic non-bank sector	48	15.1
Non-residents	4.7	0.1

Source: Reports of dealer banks and applicants for the function.

### 3.1.2. Savings bonds

In 1999, the Ministry of Finance issued savings bonds. They were addressed solely to individual investors. The sale of the instruments was accomplished through a retail network. The main difference between these and other bonds is the fact, that they are not traded in a secondary market. They may be, however, the subject of trading based on Civil Law.

**Table 11. Types of savings bonds**

1999	2000	2001
2-year savings bonds (DOS) with coupons of 10% to 13% depending on the issue	2-year savings bonds (DOS) with coupons of 13% to 16% depending on the issue	2-year savings bonds (DOS) with coupons of 16% to 10% depending on the issue
4-year savings bonds (COI) with coupons indexed to the annual inflation rate plus a fixed margin of 4.5%	4-year savings bonds (COI) with coupons indexed to the annual inflation rate plus a fixed margin of 4.5%, 5.5% or 7% depending on the issue	4-year savings bonds (COI) with coupons indexed to the annual inflation rate plus a fixed margin*

\* Starting from March 2001, the way the margin was determined was changed slightly: for the first year it was equal to 9.8% do 7.5% depending on the issue and for the following three years it was equal to 5 to 6%.

**Table 12. Size of the issue of savings bonds in 1999-2001 (as of end of period, in PLN million)**

Year	2-year bonds	4-year bonds
1999	471.2	22.7
2000	1,460.9	492.6
2001	5,168.7	889.6

Source: Ministry of Finance data.

The issuer may, at the request of the buyer, buy-back the savings bonds, collecting a commission at the same time, however not earlier than after 3 months from the day of the issue and not later than 2 months before the maturity date.

Significant limitations to the possibility to buy bonds before maturity did not adversely affect the demand, which the bonds enjoyed among individual investors, particularly in the second half of 2001. This was a result of the relatively high interest, the absence of a similar offer from banks and the "escape" from the tax on bank deposit imposed by the Ministry of Finance.

### 3.1.3. Passive bonds

A characteristic feature of passive bonds is that they are not traded in the secondary market.

The issue of passive bonds served to achieve some specific goals of the government:

- securitization of part of government debt,
- conversion of foreign debt into domestic debt,
- undertaking new liabilities outside of the financial market.

The issue of this type of securities was initiated in 1991, when USD denominated securities were issued, with maturities from 1 to 13 years. In the following years other passive instrument were issued:

- Bonds resulting from securitization of the government debt against the central bank. These bond were issued in 1993 and were denominated in zlotys. Nominal value of the issue amounted to PLN 2,438.3 million and it was converted into marketable Treasury bonds in 1998.



- Bonds issued to fund the government foreign exchange liabilities related to the use of foreign currency deposits to cover the current account deficit. The issue amounted to USD 5,453.0 million.
- Restructuring bonds used to re-capitalize 10 state-owned commercial banks. The bonds were registered instruments during the first 3 years from the day of the issue. They were issued in 1993-1994 and were denominated in the zloty. Nominal value of the 4 series of the issue equaled PLN 4,000 billion.
- Bonds issued for the purposes related to the agreement with the London Club. The bonds were addressed solely to the NBP. They were issued in 1994 and denominated in the USD. The value of the issue amounted to USD 1,237 million. In 1998 the issue was converted into marketable Treasury bonds.
- Bonds issued to re-capitalize BGZ S.A. They were issued in 1996. The nominal value of the two tranches of the issue amounted to PLN 700 million.
- The state loan bonds issued to fund the pre-payment of the long-term liabilities of the government. They were issued as registered bonds and addressed solely to the NBP. They were issued in 1997 and 1998 in connection with partial buy-back of a part of Brady Bonds, which were subject to secondary trading on the international markets. The bonds were denominated in USD. The value of the issue from 1997 reached USD 1,407.8 million and the value of the issue from 1998 reached USD 727.8 million. In 1998 the bonds were converted into marketable Treasury bonds.

All of these bonds were issued as a non-public issue. Most of them were bought by National Bank of Poland and domestic commercial banks.

In September 1999, according to the agreement between the NBP and the Ministry of Finance, a large portion of passive bonds was converted into active, marketable bonds with fixed interest rate. In 1999 bonds issued to fund obligations from agreement with the London Club banks, were converted into 2-year zero-coupon bonds.

### 3.2. National Bank Of Poland bonds (NBP bonds)

Apart from the Treasury, another public agency, which issued long term securities, was National Bank of Poland.

The NBP bonds (PL0000300018, PL0000300026, PL0000300034, PL0000300042 and PL0000300059) were issued on September 30, 1999, to absorb liquidity from banks, which was released after the central bank lowered the mandatory reserve requirement. Only these banks were not obliged to buy NBP bonds, which mandatory reserves were lower than PLN 5 million. The bonds, which were in the domestic bank portfolios, had initial maturities between 6 and 10 years and interest indexed to the inflation rate. Nominal value of the NBP bonds reached PLN 13.03 billion. They were issued as non-public securities and they were not traded in the secondary market.

### 3.3. Local government bonds

#### *Basic characteristics of the instrument*

Local governments issue their debt on the provisions of the Law on Bonds of June 29, 1995<sup>22</sup>. Municipal bonds allows to obtain financing at a cost lower than the interest on bank credit.

<sup>22</sup> Journal of Laws no 83, item 420, with subsequent change.

Municipal bonds are usually floating rate securities with interest rate indexed to the yield of 52-week Treasury bills. Interest is payable annually. The maturities of the instruments vary from 1 to 5 year.

#### **Market size**

The municipal bonds market is a relatively small segment of the debt market. In 2001 the nominal value of the municipal bonds in circulation amounted to PLN1,628.6 million, which constitutes 6.1% of the total non-treasury debt. In 2001, the demand of the local governments for this type of funding increased. In consequence the share of municipal bonds in the composition of the non-treasury debt instruments increased by 3.5%. The size of the issue programs in 1998-2001 varied from PLN 10 to 108 million<sup>23</sup>.

#### **Market organization**

Due to small volumes of the issues and high cost of public issues, all issuers, with the exception of the town of Ostrow Wielkopolski, addressed their offers to selected investors (in non-public issue). Therefore, similarly as in case of corporate debt instruments, the market for municipal bonds is organized by banks.

In practice there is no secondary market for municipal bonds. Therefore, the quotations are in the majority of cases published for informative purposes only, without conducting actual transactions.

#### **Investors**

There is no information about the structure of investors in the municipal bond market. One has only such information indirectly from the breakdown for T-bonds and the remaining bonds (including the municipal and corporate bonds). The structure of investors in such section will be presented in sub-chapter 3.4.

#### **Market liquidity**

Bonds issued by local governments are not traded in the secondary market. Usually, the buyer of such instruments decides to hold them in his or her portfolio until maturity. It is worth stressing, that relatively small issue programs, slightly larger than the value which is considered to be economically justified, dominate in the municipal bonds market.

### **3.4. Corporate bonds**

#### **Basic characteristics of the instrument**

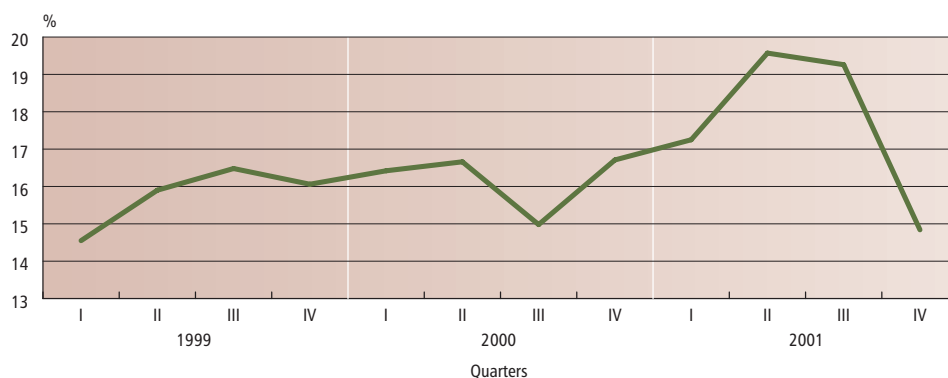
Similarly to the local governments, corporations issue bonds based on the Law on Bonds. The maturities of such bonds vary from 2 to 10 years. Corporate bonds may be fixed or floating rate instruments. Floating rate is calculated as a base rate (yield on Treasury instruments or WIBOR) plus margin.

So called revenue bonds are a special type of bonds. They are debt securities, which are collateralized by income from a given source. Authorized issuers of such bonds include e.g. companies, which perform public utility duties based on special license or permission, at least throughout the life of the bonds. Wielkopolska Highway S.A. bond is an example of an issue of revenue bonds.

#### **Market size**

There are various estimates of the corporate debt in the form of corporate bonds (which is a result of differences in the way data is obtained by NBP and Fitch Polska SA). It is certain, however, that the size of issue remains small compared to both Treasury bonds and short-term corporate

<sup>23</sup> Data based on annual reports on the state of the market developed by CERA SA "Rating and the market" (currently Poland S.A.).

**Figure 37. Share of corporate bonds in the total issue of non-treasury debt instruments**

Source: CERA S.A. (currently Fitch Polska S.A.).

securities. This situation was caused by such factors as high issue cost, absence of a well developed segment of long-term investors and legal provisions. Despite the amendment of the Law on Bonds in September 2000, there has not been any breakthrough in the development of this segment of non-treasury debt market. The best testimony to this fact is the sum of the values of all issues of corporate debt securities. In January 1999 it amounted PLN 1.13 billion and in the end of 2001, it reached PLN 2.52 billion<sup>24</sup>. In 1999, 17 companies issued bonds and 16 companies issued corporate bonds in 2000. The sizes of issue vary from PLN 30 to 700 million. The largest issue, which amounted to PLN 700 million, was organized by Thomson Polkolor<sup>25</sup>. In 2001, there was about 20 corporate bond issue programs. The share of corporate bonds in the total issue of non-treasury debt instruments increased in the last two years only from 13.6% to 14.8% (Figure 37).

### **Market organization**

#### *Primary and secondary market*

Market organization, both in the case primary and secondary trade, is the same, as described in the part on commercial papers (point 2.3.1).

#### *Settlement and depository system*

Similarly to the market for short-term debt instruments, there is no centralized depository and settlement system for the corporate bonds. Despite the provisions of the Law on Public Trading in Securities, which allow the registration of an issue of non-treasury debt securities in the NDS, only one such issue was registered. The reasons for the situation are described in the sub-chapter referring to commercial papers.

The settlement of transactions is conducted by banks, which maintain the depository accounts for the buyers of bonds, and who perform the operations associated with the initiation and redemption of an issue.

#### *Investors*

In 2001, the majority of issues of non-treasury bonds (i.e. issued by local governments and corporations) was purchased by non-financial legal persons (38.5%) and in the bank portfolios (37.4%). It is worth noting, that in the debt structure, the share of insurance companies was increasing rapidly, from 3.01% to 15.2% between 2000 and 2001. The share of foreign investors declined from 35% to 15%<sup>26</sup>.

<sup>24</sup> Data based on bulletins "Rating and market" of 1999-2001 prepared by CERA SA "Rating & Market" (currently Fitch Polska S.A.), are used in the *Report* due to longer time series. The NBP data, indicates that the size of the issues of corporate bounds is higher.

<sup>25</sup> Data based on annual reports on the state of the market (1999-2001) developed by CERA SA "Rating and the market" (currently Fitch Polska S.A.).

<sup>26</sup> Data obtained from the reports of money market dealer banks and candidates to perform the function.

*Market liquidity*

Turnover in the secondary market for corporate bonds is relatively small, however bank performing the function of an agent may take over the obligation to quote bids and ask prices for particular series of non-treasury bonds. In practice, such quotations are only conducted for information purposes.

Low liquidity of the market force investors to treat these instruments as investment portfolio security. Another important factor, limiting the development of the corporate bonds market, was the high cost of issue resulting from the statutory requirement of *representative bank*<sup>27</sup> (responsible for the financial credibility of the issuer). The development of the corporate bonds market is also limited by the tax imposed on retail investor<sup>28</sup>.

To improve the conditions for a development of the market, the Law on Bonds was amended in September 2000. The most important changes, aiming to help in the development of the market, include:

- elimination of the requirement to reach the minimum threshold to close a bonds issue<sup>29</sup>,
- elimination of the secured bonds, allowing newly created entities to issue bonds,
- elimination of the requirement to arrange for a representative bank,
- making the rules of convertible bonds issue more specific and detailed,
- allowing for the issue of dematerialized non-public bonds,
- introduction of a new bond type, i.e. revenue bonds.

**3.5. Mortgage bonds***Basic characteristics of the instrument*

The legal basis for the issue of mortgage bonds is the Law on Mortgage Bonds and Mortgage Banks of August 29, 1997<sup>30</sup>.

Mortgage bond is a registered or bearer security, backed by receivables of a mortgage bank. Bank issuing mortgage bond is obliged to make strictly defined payments.

The payments of the mortgage bonds are divided into core payments (nominal value of the bond, according to which the bond is redeemed) and secondary payments (interest payable on dates identified in the conditions of the issue).

Mortgage bonds may be issued only by mortgage banks, established and operated under the rules of the above mentioned Law. Until the end of 2001, three banks obtained licenses to conduct mortgage banking operations: HypoVereinsbank Mortgage Bank S.A., Rheinhyp-BRE Mortgage Bank S.A. and Slaski Mortgage Bank S.A.

In 2000, one issue of mortgage bonds was organized, with a value of PLN 5 million. The par value of a bond was equal to PLN 100,000, the issuer was Rheinhyp-BRE Mortgage Bank SA and the issue was organized by BRE Bank S.A.

In 2001, Rheinhyp-BRE Mortgage Bank issued on the domestic market 3 and 4-year mortgage bonds with value of USD 20 million and 3-year bonds amounting to EUR 5 million.

<sup>27</sup> This duty is enforceable since September 1, 2000.

<sup>28</sup> Currently the interest and discount on Treasury securities purchased after November 30, 2001 are taxable.

<sup>29</sup> In light of the currently binding regulations, from September 1, 2000, the issuer is not obliged to set the size of the amount for the issue to be successful.

<sup>30</sup> Journal of Laws no 140 item 940 with subsequent changes.

**Market organization**

The issue of mortgage bonds is organized by banks, which own mortgage banks. They perform the functions of a dealer, payment agent and custodian.

**Investors**

Mortgage bonds, both denominated in zlotys and in foreign currencies, are a part of the domestic bank asset portfolios.

Current regulations on mortgage bonds and mortgage banks limit the development of this financial market segment. In particular this concerns such statutory limitations as:

- the amount of a single mortgage credit cannot exceed 80% of the value of real estate, on which the mortgage was established to secure the loans refinanced from the funds obtained from the issue of mortgage bonds,
- additional liabilities of mortgage banks cannot exceed 200 per cent of the value of their own funds,
- mortgage bonds cannot be backed by municipal receivables.

In light of the current regulations, mortgage banks cannot increase the volume of credit above the volume of funds obtained from the interbank market. Another factor limiting the development of the mortgage bond market is the inability to put the cash at the disposal of the borrower before the mortgage is established (time consuming procedures).

**Market maturity**

There is no secondary mortgage bonds market. Bank, which buy the mortgage bonds, hold them in their portfolios until maturity.

**3.6. Stocks****Basic characteristics of the instrument**

A stock is an equity instrument, giving the owner the right to dividend and participation in voting at the general assembly of shareholders. The first stock issued in Poland, after 50 years, was Igloopol Dębica, which was issued in April 1989. The equity instruments took dematerialized form (electronic book entry) from the very beginning.

In August 1998, a new instrument was introduced at the Warsaw Stock Exchange in the form of subscription warrants (PDA). Subscription warrant allows the buyer of new issue of stock to sell the shares before they are listed on the exchange. The goal of introduction of the instrument was to solve the problems caused by the duration of listing procedures.

The shares of 14 National Investment Funds (NIF)<sup>31</sup> are traded in the WSE.

These companies were created in the process of the Mass Privatization Program. The shares of NIFs were listed on the stock exchange on June 12, 1997.

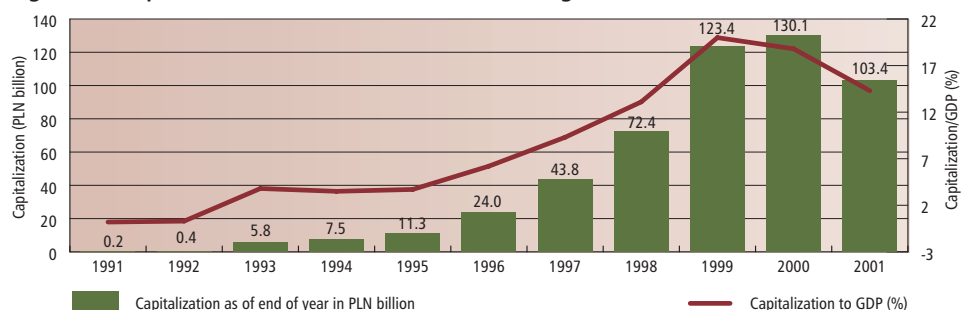
Equity instruments are traded on the Warsaw Stock Exchange and on CeTO.

**Market size**

In 1998-2000, the capitalization of the stock market increased significantly. During the three years the market grew by 83%. The high growth rate was caused mainly by the privatization process of large state companies, such as: Bank Pekao S.A., Telekomunikacja Polska S.A. (1998) and Polski Koncern Naftowy Orlen S.A. (1999). Apart from the above mentioned, 95 companies are

<sup>31</sup> There were 15 NIF companies in 1998-1999.

Figure 38. Capitalization of the Warsaw Stock Exchange



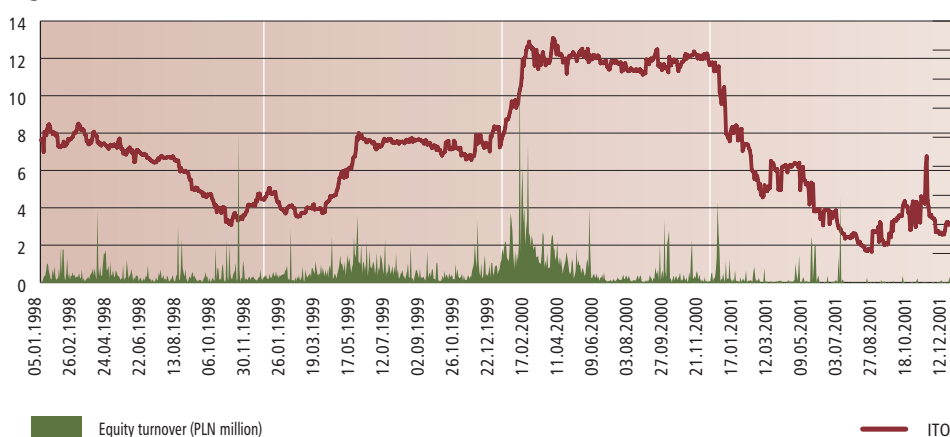
Source: WSE data.

Table 13. Basic WSE statistics in 1998-2001

	1998	1999	2000	2001	Change (%)	Change (%)	Change (%)	Change (%)
	1	2	3	4	5 (2/1)	6 (3/2)	7 (4/3)	8 (4/1)
1. Capitalization of the exchange as of end of period (PLN million)	72,442	123,411	130,085	103,370	70.4	5.4	-20.5	42.7
2. Number of companies traded on the exchange	198	221	225	230	11.6	1.8	2.2	16.2
3. Liczba spółek debiutujących na giełdzie	57	28	13	9				
4. WIG Index								
– beginning of the year level (points)	14,886.2	13,218.1	18,981.7	17,672.8	-11.2	43.6	-6.9	18.7
– end of year level (points.)	12,795.6	18,083.6	17,847.5	13,922.2	41.3	-1.3	-22.0	8.8
– minimum level during the year (points.)	10,473.7	12,470.0	14,929.3	11,564.6	–	–	–	–
– maximum level during the year (points.)	18,582.7	18,370.0	22,868.4	17,875.9	–	–	–	–
– rate of return on the index (%)	-12.8	41.3	-1.3	-22.0	–	–	–	–
5. Number of investment accounts at year end (thousands)	1,262	1,158	1,236	1,085	-8.2	6.7	-12.2	-14.0
6. Share of WSE capitalization to GDP (%)	-13.14	20.05	18.84	14.26	52.6	-6.0	-24.3	8.5

Source: CeTO data.

Figure 39. Turnover value and ITO index on CeTO



Source: CeTO data.

listed on the stock exchange, which additionally increases the market capitalization. Of the 98 companies, which had their debut on the WSE in 1998-2000, 7 were included in the privatization process of state owned companies. The growth in capitalization of the WSE resulted also from the

**Tabela 14. Podstawowe wskaźniki rynku CeTO w latach 1998–2001**

CeTO	1998	1999	2000	2001
Number of listed companies	25	24	21	21
Capitalization (PLN million)	375	323	275	193
ITO index value (points)	11,500.1	15,548.8	15,254.1	9,114.9

Source: dane CeTO.

rise in the WIG index by 39.5%. In 2001, market capitalization declined 20.5%. The reason for the decline was a small number of listings and the decrease WIG index due to a general deterioration of macroeconomic conditions in Poland and abroad (Figure 38).

In contrast to the WSE, the number of companies listed in the CeTO market declined. The reason was that the companies moved to the WSE and the simultaneous absence of new market entrants. In 2000, five companies moved from CeTO to the Warsaw Stock Exchange, which offers better prestige and, above all, liquidity. In 1998–2001, capitalization of CeTO declined by 48.5% (Figure 39).

**Box 9****STOCK EXCHANGE INDICES**

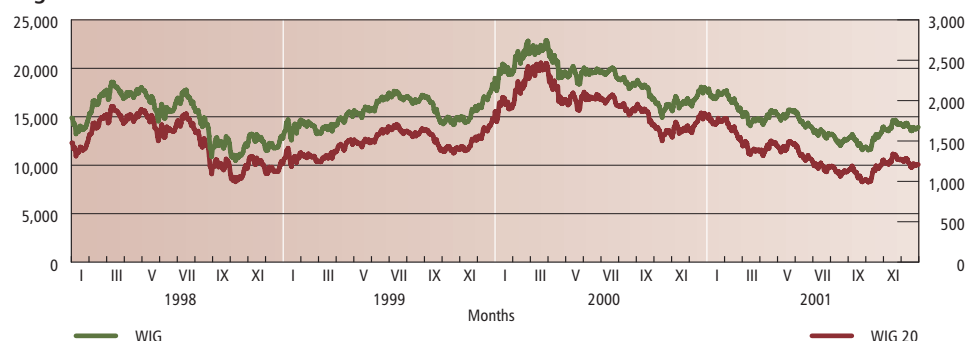
WSE published four types of indices: Warsaw Stock Exchange Index WIG, WIG20, Warsaw Index of the Parallel Market WIRR and National Investment Funds NIF Index. In September 1998, MIDWIG, a new index including 40 mid size companies was introduced. From May 1999, sectoral sub-indices are published for the sectors of: banks, construction, food processing, telecommunications and information technology. In May 2000, a new index TechWIG, was introduced for companies from the telecommunications and information technology industry, which were included in the Innovative Technology Segment (SiTech).

Despite the growing economy in Poland in the first seven months of 1998, the investors ended the year with losses. The main market index, WIG, lost 12.8%, WIG20 lost 16.2%, and the parallel market index, WIRR, lost 49%. The losses were caused by a general deterioration of global markets initiated by the Russian Crisis.

In 1999 investors realized a positive rate of return, compared to 1998. All the WSE indices increased, with the highest growth noted by the WIG20 (43.8%). Warsaw Stock Exchange enjoyed a strong bull market throughout the year, with the exception of the third quarter. This was a reflection of the situation on the foreign capital markets, which influenced the WSE.

Year 2000 was characterized by the dot.com bull market, which was initiated on the main global exchanges, mainly on the American NASDAQ. The main market index, WIG, exceeded one historical maximum after another. The bull market lasted until April, however, the entire year 2000 generated a negative rate of return, equal to 1.3%.

Due to the declining trend throughout 2001, the rate of return on WIG was also negative and reached 22% in 2001. WIG index reached the level of 13,922.2 points at the end of 2001, which brought it back to the levels of 1998. The deteriorating markets brought the rates of return on stock market indices to negative levels. The greatest decline was recorded for TechWIG (59.5%). Only the MIDWIG index reached a positive rate of return, equal to 1.6%.

**Figure 40. Indices of the main market WIG and WIG20 on the WSE**

Source: WSE data.

### Market organization

#### Primary market

Public trading in securities is regulated by the Law on Public Trading in Securities of August 21, 1997<sup>32</sup>. The Law defines the terms of “public trading” and the methods and rules of introducing securities to the regulated market. The Securities and Exchange Commissions issues a permission for an introduction of securities to trading, once the issuer meets certain specific conditions. The issuers are obliged to place an application to the SEC with the following attachments: issue prospectus, statutes, incorporation act, etc.

A company planning to list its shares on the exchange, places an appropriate application with the Board of the WSE. Following that, the Management of the WSE decides on the introduction of the shares of a company to trading in one of the three markets. Listing criteria, which are different for each of the markets, are determined in the Rules and Regulations of the Exchange. These include, among others, minimum value of shares to be listed, minimum book value and share capital of the company.

The decision on listing of a security on CeTO is made by the Supervisory Board of the joint stock company, Central Table of Offers S.A. (CTO S.A.). Listing requirements are much less stringent than on the WSE. There are no requirements of a minimum level of share capital or book value of the company. The cost of entry to CeTO are much smaller than in case of the WSE, since the companies are not obliged to prepare an issue prospectus, but only a memorandum. Also the disclosure requirements differ. This capital market segment was established for small and medium size enterprises. Despite these benefits, the market is not very popular and does not enjoy a satisfactory level of growth. This is caused by many factors, in particular:

- relatively high cost of capital compared with the needs of small and medium enterprises<sup>33</sup>, which includes such items as legal advice costs, external audit costs, preparation of memorandum of information and marketing of the issue; in the case of small companies, organizing small issues, such costs may prove excessive,
- fear of the current owners of hostile takeovers and of disclosing confidential information to their competitors. Firms are afraid that the publication of their financial reports, investment plans, and contract plans will make such information available for their competitors, which are not subject to such disclosure requirements,
- low level of knowledge about the CeTO market. Frequently the owners of companies are not aware of the system, according to which the market operates, they do not understand the benefits, the market can offer.

<sup>32</sup> With subsequent changes.

<sup>33</sup> An estimated cost of listing on CeTO equals PLN 100 to 150 thousands, plus the possible advertising and promotion costs.



In 2001, CTO S.A. introduced many new procedures, which aim to help companies on their way to go public. The institution of an authorized advisor was established, for instance, whose task is to prepare companies for listing on the CeTO market. The fee schedule of CeTO has changed as well as the regulations concerning the issue prospectus. Thanks to the changes, the cost of listing in the market and the presence in the market should be reduced. Polish Agency of Entrepreneurship Development will award small and medium companies with subsidies to prepare them for participation in the capital market. All these changes are supposed to help the development of the CeTO stock market, which, unfortunately, declined in 2001.

#### Secondary market

Organized secondary trading in securities is conducted at: the Warsaw Stock Exchange and the Central Table of Offers SA, established in 1996 by brokerage houses and banks. It operates as off-exchange CeTO market. The Amended Law on Public Trading in Securities introduced in January 2001 a new classification of regulated markets into:

- official stock exchange market (WSE),
- unofficial stock exchange market (not established yet),
- unofficial off-exchange market (CeTO).

In April 1991, the Warsaw Stock Exchange was established, to become the main venue of organized trade in shares of stock and other equity instruments. Stocks may be listed in one of the three markets of the WSE, depending on the size of the company:

- main market – large companies,
- parallel market – medium companies,
- free market – small companies with growth potential.

Brokerage houses and banks conducting brokerage activities, which are direct members of the WSE participate directly in the stock exchange equities trading<sup>34</sup>. Only these entities are authorized to execute transactions on the floor.

In 1998, trading sessions were held from Monday to Friday between 11 a.m. and 3 p.m. Starting from January 1999, trading sessions are extended and they begin at 10 a.m. and end at 4 p.m. Until November 2000, all stocks were traded in a single daily price fixing, while the most liquid were traded in a continuous trading system. Shares of one issuer could be traded in both systems at the same time. Moreover, transactions could be also executed outside of the designated sessions.

In November 2000, a new trading system WARSET was introduced. After the implementation of the system the schedule of the trading session changed, and they begin at 10 a.m. and end at 4.10 p.m. Depending on the liquidity, particular shares can be traded in one of the following systems: continuous trading system and a double daily price *fixing* system. Shares of the most liquid companies are traded in the continuous trading system. Less liquid stocks are traded in the double daily price fixing system. The shares of one company are not allowed to be traded in both systems. The introduction of the new system allows the investors to place new types of orders. The system

**Table 15. Number of companies listed on particular WSE markets in 1998-2001**

Type of market	1998	1999	2000	2001
Main	117 + 15 NIFs	119 + 15 NIFs	121 + 14 NIFs	123 + 14 NIFs
Parallel	51	61	67	61
Free	15	26	23	32

Source: WSE data.

<sup>34</sup> An entity may become the Exchange participant if, among others: it is a shareholder of the Exchange, a juridical person and a direct participant of the NDS.

can accept and execute approximately 40 orders per second. The stock exchange market is an order driven market, which means that the prices of particular stocks are determined based on orders of buyers and sellers.

Apart from the WSE, equities are also traded publicly in the CeTO market. Starting from January 16, 2001, the market constitutes a regulated off-exchange market, where mainly stocks and bonds are traded. The market is operated by CTO SA. From November 2000, over 50% of shares of CTO SA is owned by a strategic investor – the Warsaw Stock Exchange SA. Direct participants of trade are brokerage houses, and banks conducting brokerage operations, so called members. The trading in the regulated off-exchange market is decentralized. Shares may be traded in the central market and on the universal market<sup>35</sup>. Decision on the choice of market is made by the Supervisory Board of the CTO SA at the application of the issuer. One of the main conditions, which must be met, to introduce the shares into the central market, is that the security must have at least one market maker. Another criterion is the market value of the shares or own funds of the issuer, constituting the PLN equivalent of at least EUR 250 thousands.

Transactions are executed from Monday to Friday from 9 a.m. till 4 p.m. in the continuous trading system. Offers could be placed in the market only by the CeTO participants, who are market makers for a given security. CeTO, as opposed to the WSE, is a price driven market.

#### *Settlement and depository system*

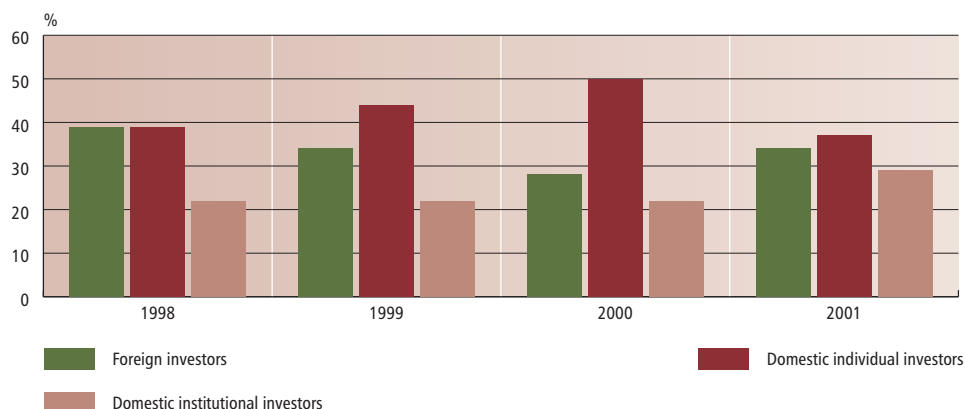
Publicly traded shares are dematerialized. The settlement of transactions is conducted in a T+3 settlement cycle based on DVP model II at the National Depository for Securities.

#### *Investors*

In the analyzed period, the dominant role among investors in the stock market was played by domestic individual and institutional investors.

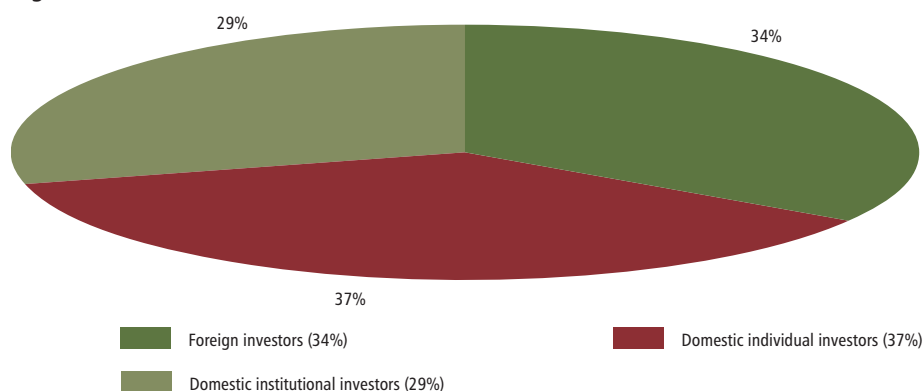
A vast majority of transactions at the WSE was executed by the individual investors. Their share in the turnover was continuously growing from 39% in 1998 to 50% in 2000. In 2001 the share declined to 37%. The reasons for the reversal of the trend was the bear market the WSE. From 1996, the interest of foreign investors in the shares listed at the WSE was increasing. Starting from 1998, their share in the turnover began declining as a result of the withdrawal of foreign capital from the Polish market after the Russian crisis. In 2001, the share of the foreign investors in the stock market turnover increased again to 34%. The share of particular sectors is presented in Figures 41, 42 and 43.

**Figure 41. Structure of turnover in equities in 1998-2001**

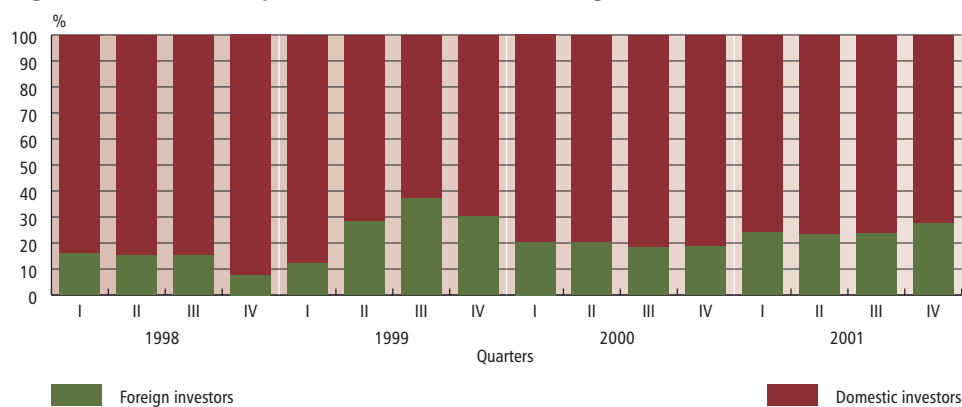


Source: WSE data.

<sup>35</sup> Depending on whether the CeTO by laws requirements are met or not, shares may be listed on one of the two segments of the market: central or universal.

**Figure 42. Investors in the stock market (2001)**

Source: WSE data.

**Figure 43. Stocks in the portfolios of domestic and foreign investors**

Source: WSE data.

**Table 16. Types of investors by their share in the turnover (in %)**

Investors	Share in the trade			
	1998	1999	2000	2001
Domestic	61	66	72	66
Foreign	39	34	28	34

Source: WSE data.

**Table 17. Average share of stocks in the OPFs portfolio (in %)**

1999	2000	2001
13.20	31.27	27.41

Source: Office for the Supervision of Pensions Funds' data.

In 1998-2000, the share of domestic institutional investors in the turnover remained unchanged at the level of 22%. In 2001, it increased significantly to the level of 29%, as a result of demand from pension funds.

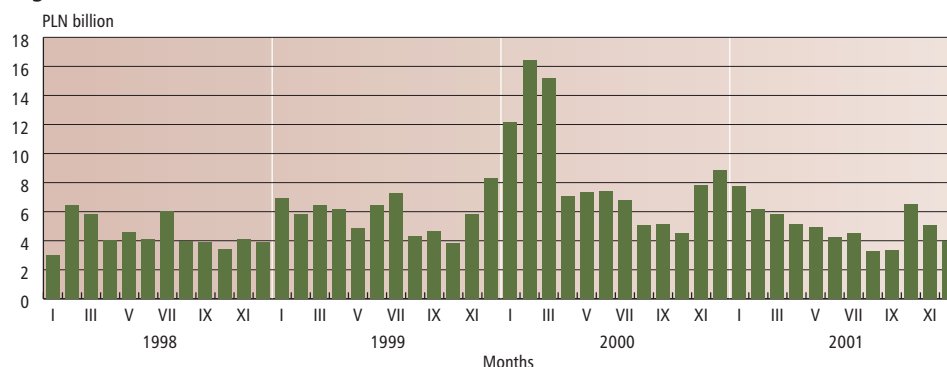
Pension funds (OFE) are allowed to invest up to 40% of their sources in stocks. They prefer to invest in WIG20 companies and MIDWIG companies. By the end of 1999, the value of pension funds' stock portfolio reached PLN 645 million (which constituted 29.7% of the entire portfolio of assets), to achieve the level of 28.3% of the value of portfolio (PLN 5,328 million) by the end of 2001. The following funds invested over 30% of their assets in stocks: OFE "DOM", OFE ING Nationale-Nederlanden Poland, OFE Pocztylion and OFE Commercial Union BPH CU WBK. The demand from pension funds may limit the *free float* as they are long-term investors.

### Market liquidity

#### Gross turnover

The average turnover per session in the stock market fluctuated in the analyzed period. The highest level was recorded in 2000 and the lowest in 1998. In 1998 the turnover was declining, which was mainly the result of a bear market in the global capital market. This situation was aggravated additionally after the outbreak of the Russian Crisis. Starting from the end of 1998 until the end of the first quarter of 2000, the activity of investors, as measured by the volume of the turnover, increased significantly. The increase of activity was caused by, among others, the emergence of a new type of institutional investor in the form of the open pension funds. The source of growth in the beginning of 2000 was, in turn, the so called internet rush. The prices of the new economy stocks were rising sharply. In 2000, the total turnover of the stock market increased by 95% as compared with 1998. In the second quarter of 2000, the trend was reversed and the turnover declined by 45%. The falls continued also in 2001 (Figure 44). This was caused by a bear market,

Figure 44. Turnover at WSE in 1998-2001



Source: WSE data.

Table 18. Market statistics in 1998-2001

	1998	1999	2000	2001	Change (%)	Change (%)	Change (%)	Change (%)
	1	2	3	4	5 (2/1)	6 (3/2)	7 (4/3)	8 (4/1)
1. Stock market turnover – total (PLN million)	53,287	70,831	103,658	60,548	32.9	46.3	-41.6	13.6
– average per session (PLN million)	249.4	357.3	676.4	321.8	43.3	89.3	-52.4	29.0
2. Liquidity ratio (%)	58.2	46.1	42.9	30.8	-20.8	-6.9	-28.2	-47.1
3. Number of trades per session	14,365	17,417	14,919	12,512	21.2	-14.3	-16.1	-12.9

Source: WSE data.

Table 19. Value of stock market turnover on CeTO in 1998-2001

CeTO	1998	1999	2000	2001
Value of turnover (in PLN million)	121	168	241	40

Source: CeTO data.

which was in turn brought about by many factors, both internal and external. The internal factor was the deteriorating macroeconomic situation in Poland, the increasing political risk, associated with the parliamentary elections, and the decreasing earnings of companies listed at WSE.

*The ratio of the capitalization of the market*

The ratio of the volume of gross turnover to the capitalization of the market is the indicator of stock market liquidity. In 1998, this ratio reached 58.2%. Despite the growth in turnover and the number of transactions in 1999, the stock exchange liquidity indicator declined to 46.1%. In 2000, it experienced another fall to the level of 42.9% and in 2001 to 30.8%.

The proportion of shares in free float has remained on low levels for the last several years. This is associated, among others, with pension funds investment policy, which is limited to passive "buy and hold" strategy.

3

**Table 20. Structure of shareholders of 50 largest companies traded at the WSE at the end of 2000**

Investor type	Share (%)
Free float	30
Investors holding 5% of shares or more, together with GDR holders	11
State Treasury	15
Strategic investors (majority owners)	44

Source: „Rzeczpospolita” of February 1, 2001, based on SEC information.

## 4

## Foreign exchange market

*Basic characteristics of the market*

The domestic foreign exchange market is for transaction involving the Polish zloty. Such transactions are executed not only by domestic entities with domestic or foreign entities, but also between non-residents, as it is the case in the London foreign exchange market. However, the NBP does not have information about the size of the zloty transactions in the London market. Therefore all the following data cover transactions, in which one of the parties is a domestic bank.

In 1998-2001, the standard size of an interbank foreign exchange transaction was USD 5 million and EUR 5 million, with the minimum amount of 1 million. The trading currency in the Polish foreign exchange market is the US dollar. In 1998-2001, on average, 70% of transactions in the domestic foreign exchange market were the transactions involving zlotys and dollars. After 1999, the share of the euro reached approximately the level of 10% despite the fact, that the euro is the basic currency in the Polish foreign trade. In 2001, the share of the euro in payments for exports reached 54.6%, while in case of import it reached 54.2%.

The main reason for the low share of the euro in the trade in the foreign exchange market is that the USD is traditionally the main currency in the interbank market. Other factors, which might produced such situation are as follows:

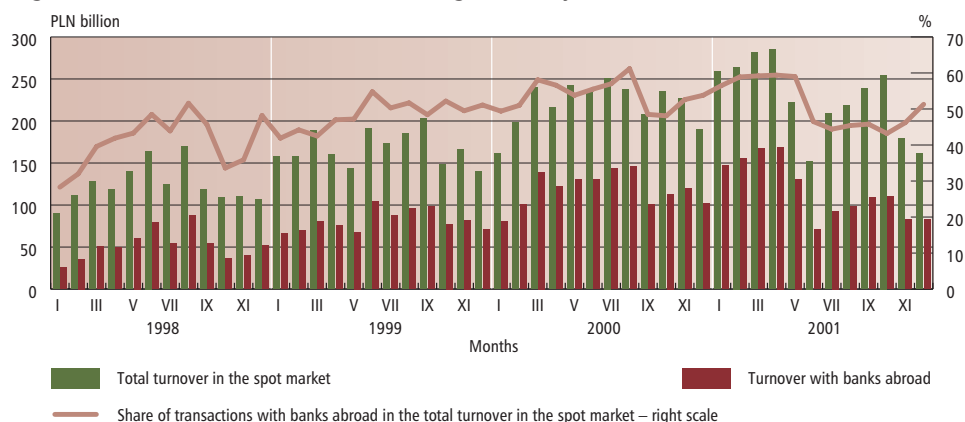
- weakening of the euro in 1999-2000, which increased the profitability of maintaining fx positions in the US dollars,
- derivative instruments are denominated in US dollars (fx swaps, foreign exchange options).

Other currencies, mainly the pound sterling and Swiss frank, were also traded in the fx market.

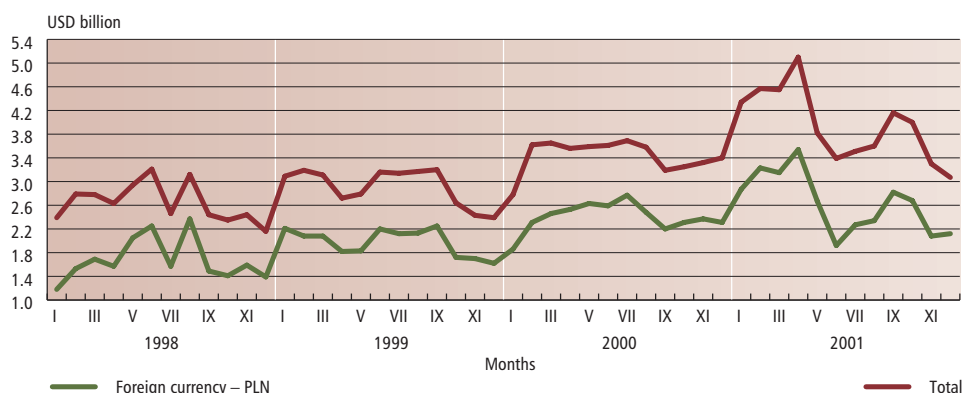
*Market organization and participants*

Foreign exchange market is an interbank market. Banks perform the functions of market-makers, standing ready to purchase and sell currencies. In Poland over 60% of turnover is concentrated in 5 most active banks. Their share in the total turnover in 1998-2000 varied between

**Figure 45. Interbank fx market (PLN – foreign currency)**



Source: Reports of dealer banks and applicants for the function.

**Figure 46. Daily average turnover in the interbank fx market in 1998-2001**

Source: Reports of money market dealer banks and applicants for the function.

62-64%. In 2001, the share increased to 69%, which was caused mainly by the consolidation processes in the banking system.

The activity of foreign banks is constantly growing. Their share in the total turnover on the domestic market increased from 42% in 1998 to 52% in 2001 (Figure 45). This trend is expected to continue after 2002, when financial institutions of the OECD countries will have the right to operate freely in Poland on the same conditions as domestic financial institutions.

#### Market liquidity

The growing average daily turnover, which increased from USD 1.7 billion in 1998 to USD 2.6 billion in 2001, points to a gradual growth of liquidity of the domestic interbank foreign exchange market. At the same time, the average daily gross turnover, which includes transactions of domestic banks in all currencies increased from USD 2.6 billion in 1998 to USD 4.0 billion

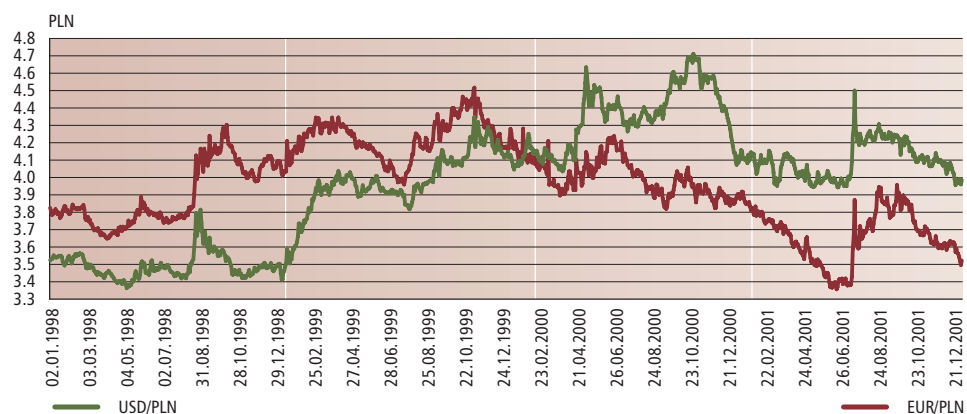
#### Box 10

### EXCHANGE RATE MECHANISM

In 1995-2001, the exchange rate system in Poland was gradually changed from fixed to floating rate. In 1995 a trading band was implemented, which allowed the zloty to fluctuate  $\pm 7\%$  around the parity rate.

A fundamental change was introduced in 1998, when the NBP abandoned interventions in the foreign exchange market. Due to the withdrawal from interventions, the NBP introduced a system, which was very similar to a free floating system, although formally, the trading band was still in operation. In October 1998, the NBP broadened the band to 12.5%, five months later, in March 1999, to  $\pm 15\%$ . The only form of active presence of the NBP in the foreign exchange market was the so called *transaction fixing*, during which banks were buying and selling foreign currencies in direct transactions with the central bank. In June 1999, *transaction fixing* was discontinued. The zloty was fluctuating freely within the 30% band. In April 2000, the band was abandoned and the zloty was floated (Figure 47). The NBP publishes daily information on the fixing exchange rate, based on quotes of the 10 most active banks in the foreign exchange market (banks which perform the function of the money market dealers).

Figure 47. PLN exchange rates in 1998-2001



Source: Reuters.

in 2001 (Figure 46). The growth of turnover was not sufficient to translate to a substantial narrowing of market spreads.

The share of the zloty in the domestic banks spot market transactions increased from 64% to 70% in the period 1998-2001. This trend is expected to continue in the future, due to the growing integration of the domestic financial market with the international markets, which causes an increase in the activity of foreign entities.

Due to the growing scale of the trade, the liquidity of the domestic foreign exchange market is constantly improving.

Despite the consistent growth of the trade, the domestic foreign exchange market is still relatively shallow. One of the reasons is low capitalization of domestic banks, which limits the scale of trading.



## 5

### Forward markets

In forward markets parties agree to settle transactions with future delivery at a pre-determined price. The price of a forward instrument depends on the price of the underlying spot instrument and the cost of carry.

#### 5.1. Instruments for short-term interest rate risk management

Instruments enabling to hedge against the short-term interest rate risk are traded in the interbank market (FRA contracts) and at the stock exchange (interest rate futures). In Poland the FRA market is much more developed.

##### 5.1.1. FRA contracts

###### *Basic characteristics of the instrument*

The most frequently used instrument of hedging against short-term interest rate risk are FRAs (*Forward Rate Agreement*), which offer payments for the deviations of future interest rates from the initial level of forward interest rate. The stronger the expectation of the market, that interest rates will rise or fall, the higher or lower is the forward level of interest rates in the FRA market. Therefore, interest rates in the FRA market reflect expected interest rate level.

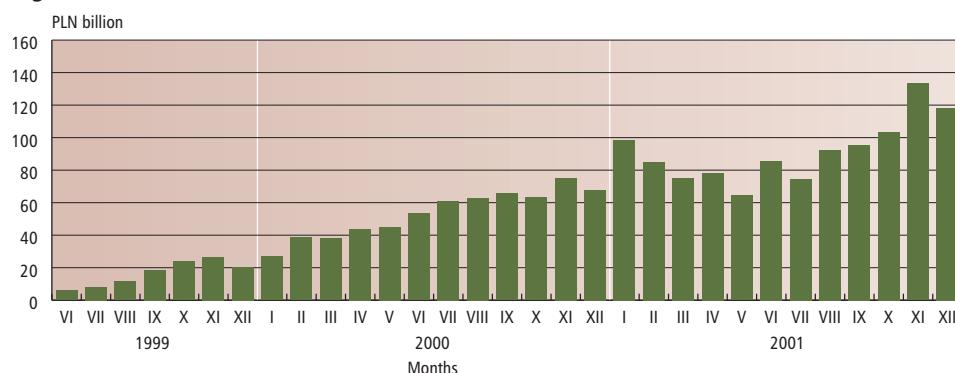
The reference rate for FRA contracts in Poland is WIBOR. This means that the interest rate differentials are calculated between the initial forward interest rate and the level of WIBOR on the day of the settlement of FRA transaction. FRA contracts allow for hedging against short-term interest rate risk for various periods, which are quoted as "1x2, 9x12, 6x12" etc. The first number informs on the value day of transaction and the second about its maturity. For example, FRA "9x12" means that FRA contract for a 3 month WIBOR will be settled in 9 months. The nominal value of a transaction is subject to a contractual agreement.

The first FRA transactions in Poland were offered by banks in the second half of 1998. At the beginning only domestic banks participated in the FRA market.

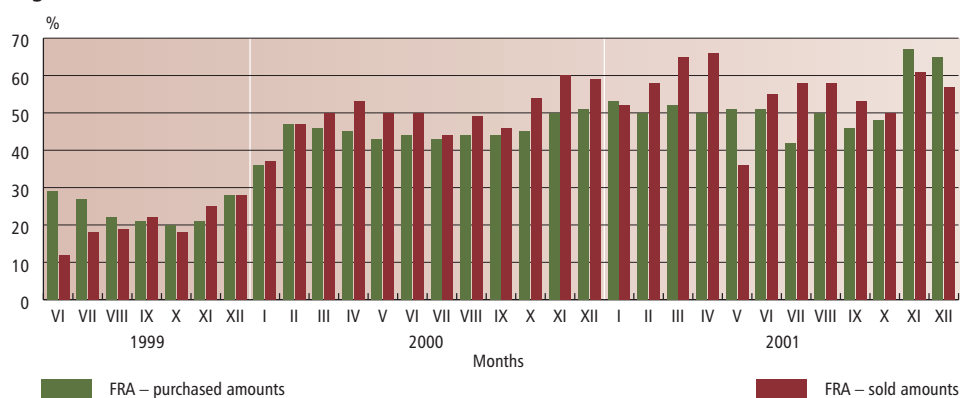
The bank reporting system divides FRA transactions into speculative and hedging. A majority of transactions is classified by banks as speculative. In the analyzed period, hedging transactions constituted on average only 3.1% of the total value of FRA contracts portfolio (sold amounts) of the Polish banks.

###### *Market size*

Information about the number and the volumes of the FRA transactions executed by domestic banks are available since June 1999. Until December 2001, the exposure of the banking system in the FRA market, measured by the nominal value of all executed contracts (the sum of amounts bought and sold), increased from PLN 6 billion to PLN 118 billion. This reflects the rapid growth of the FRA market. The increases in the volume of executed transactions were not of the same size. One of the reasons was that the demand for FRA contracts grows faster in periods of expectation on interest rate changes. Particularly large increases in the volumes of turnover in the FRA market were recorded in January and November 2001 (Figure 48).

**Figure 48. FRA market**

Source: Bank Call Reporting.

**Figure 49. FRA market – non-residents share**

Source: Bank Call Reporting.

### *Market organization*

FRA market is a segment of interbank market. The degree of concentration, measured by the share of the 5 most active banks in the total market turnover, amounted to 88% in 2001.

### *Market participants*

The analysis of Polish banks participation in the FRA market confirms, that both foreign and domestic institutions actively participate in the PLN denominated FRA market. The existing reporting system does not provide information on what portion of domestic banks transactions with domestic entities constitutes transactions with non-bank entities. Available data indicate clearly that the role of foreign entities in the FRA market is increasing steadily. Between June 1999 and December 2001, the share of non-residents in transactions of domestic banks in the FRA market (according to amounts bought) increased from 29% to 65% (Figure 49).

### *Market liquidity*

The volume of transactions in the FRA market has been reported by banks from 2001. Data obtained from money market dealer banks show, that gross turnover (amounts bought and sold) was very volatile in 2001. The largest volume of transaction was recorded in January (approximately PLN 65 billion) and in November (around PLN 66 billion), while the lowest level was recorded in March (around PLN 35 billion) and in December (around PLN 33 billion). The average monthly gross turnover in 2001 reached PLN 49 billion.

### 5.1.2. Futures contracts

#### *Basic characteristics of the instrument*

Interest rate futures are standardized forward contracts where the parties agree to settle the difference between future price of the purchased (sold) contract and the initial price of the contract. Interest rate futures are in many respects similar to the FRA contracts. The differences between the two instruments are highlighted in Table 21.

**Tabela 21. Podstawowe różnice między kontraktami FRA i futures**

FRA contracts	Futures
Over-the-counter market	Stock exchange
Non-standard (high flexibility)	Standardized
One time settlement	Daily settlement
Negotiable prices	Market prices
Credit risk	No credit risk (it is taken over by the clearing house)
Settlement date agreed by the counterparties (specific day)	Delivery date set by the exchange (a period of several days)

The first interest rate futures were introduced by Warszawska Giełda Towarowa (Warsaw Commodities Exchange, WCE) in February 1999. They were also offered by the Polska Giełda Finansowa (Polish Financial Exchange, PFE) over a period of time.

Characteristics of the standard exchange traded futures are presented in Table 22.

**Tabela 22. Wybrane elementy standardu procentowych kontraktów terminowych na WGT i PGF**

Characteristics	WCE	PFE
<b>Futures on 1-month WIBOR</b>		
Underlying instrument	Deposit according to 1M WIBOR	Deposit according to 1M WIBOR
Size of contract	PLN 1,500,000	PLN 3,000,000
Trading unit	100 minus 1M WIBOR rate (annual)	100 minus 1M WIBOR rate (annual)
Price tick	0.01 of a percentage point	1 basis point (0.01%)
Month of execution	March, June, September, December and the current month (at most, one year in advance)	3 closest calendar months + 2 following from the March quarterly cycle (March, June, September, December)
Method of settlement	Cash in PLN, up to 1-month WIBOR rate	Cash in PLN, up to 1-month WIBOR rate
<b>Futures on 3-month WIBOR</b>		
Underlying instrument	Deposit according to 3M WIBOR	Deposit according to 3M WIBOR
Size of contract	PLN 500,000	PLN 1,000,000
Trading unit	100 minus 1M WIBOR rate (annual)	100 minus 1M WIBOR rate (annual)
Price tick	0.01 of a percentage point	1 basis point (0.01%)
Month of execution	March, June, September, December and the current month (at most, one year in advance)	3 closest calendar months + 2 following from the March quarterly cycle (March, June, September, December)
Method of settlement	Cash in PLN, up to 3-month WIBOR rate	Cash in PLN, up to 3-month WIBOR rate

Source: WCE, PFE.

#### *Market size*

Attempts to create a liquid interest rate futures market was not successful. The turnover reached the maximum value of only PLN 22.5 million in June 1999. In 2000, transactions for amounts larger than PLN 100 million were executed only in April and May. Starting from that time, no new transactions were concluded until the end of 2001.

### *Market organization*

Futures are traded at the WCE in an open-outcry system (transactions executed directly on the floor). Independent brokers, the so called locals, were to play an important part in the organization of trading and providing liquidity. They executed transactions in their own name and for their own account, operating directly on the floor. WCE trading sessions are held in a continuous trading system between 9.15 a.m. and 3 p.m.

### *Market participants*

The interest rate futures market was established to serve institutions exposed to interest rate risk, i.e. borrowers and lenders. Financial institutions, most of all banks, do not use futures contracts to hedge themselves against risk. The majority of their transactions is executed in the interbank FRA market.

### *Market liquidity*

The futures market for interest rate instruments is not liquid in Poland. WCE was, until recently, the only relatively active exchange market for interest rate futures. Despite the efforts of the organizers of the exchange, the attempt to create a liquid interest rate futures market failed. The main reasons for the failure included, among others:

- lack of demand from companies, which have not started to manage systematically their financial risk,
- lack of participation of banks, which reluctantly execute transactions for small amounts,
- strong competition from the FRA market, which also offers a possibility to execute forward contracts allowing to hedge against the interest rate risk.

## 5.2. Instruments for management of the exchange rate risk

In the case of exchange rate, similarly to interest rate forward contracts, there is a possibility to hedge against the risk both in the interbank market (outright forward contracts) and on the exchanges (futures).

### 5.2.1. Forward transactions

#### *Basic characteristics of the instrument*

Outright-forward transactions are agreements on a delivery of a specified amount of currency at a pre-agreed exchange rate at a given time in the future. It is possible to enter also non-delivery forwards (NDF) where there is no obligation to deliver currency, but, instead, to settle the differential between the initial forward exchange rate and the future spot rate on the day of settlement.

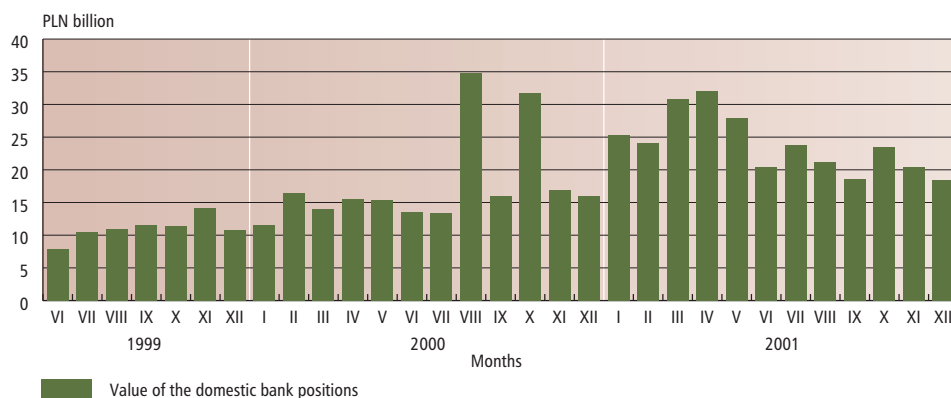
The size of individual transactions is adjusted to the needs of customers and is contractually negotiable. 57% of the outright-forwards were transactions denominated in USD. The share of EUR amounted to 7%<sup>36</sup>.

Standard maturity of transactions ranged from 1 week to 12 months.

#### *Market size*

The value of currencies bought and sold by domestic banks in *outright-forward* contracts increased from PLN 7.9 billion in June 1999 to PLN 18.5 billion in December 2001 (Figure 50).

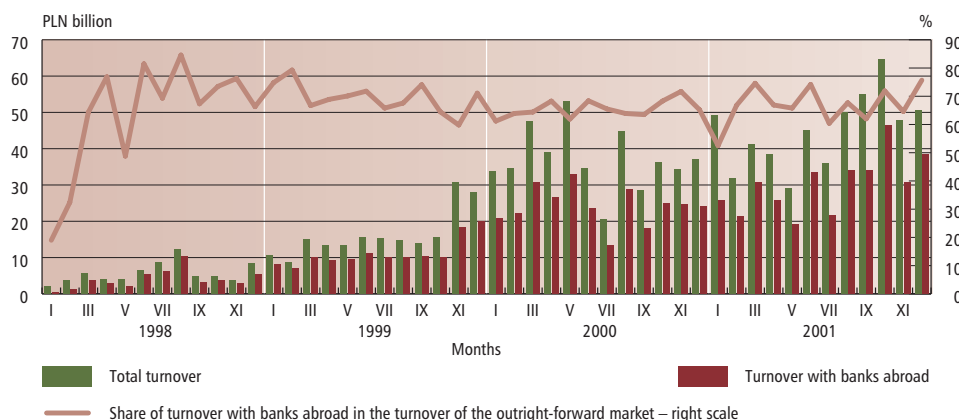
<sup>36</sup> In absence of data for 1998-2000, the average for the year 2001 was quoted.

**Figure 50. Fx outright-forward market**

Source: Bank Call Reporting.

**Market organization and participants**

The main role in outright-forward market is played by banks. A large proportion of their transactions is executed with non-residents. The share of non-residents in the turnover increased from 19.0% in January 1998 to 75.7% in December 2001 (Figure 51).

**Figure 51. Turnover in the fx outright-forward market (foreign currency – PLN)**

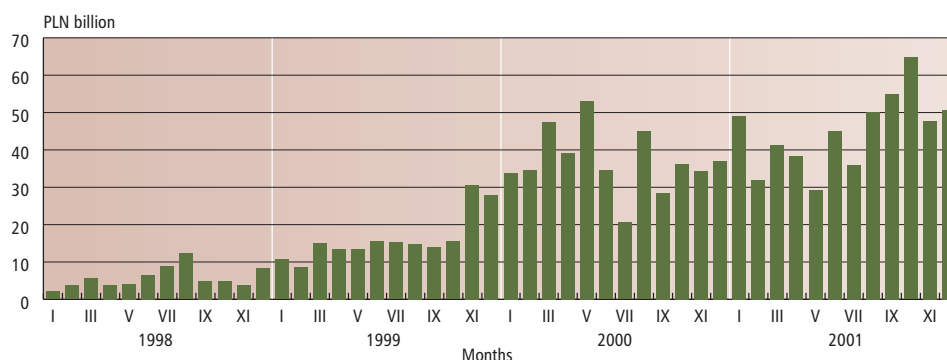
Source: Reports of money market dealer banks and applicants for the function.

**Market liquidity**

During the last four years, the scale of transactions in the outright-forward market was much lower than in the spot foreign exchange market. This was caused by the fact that mainly bank clients were using this type of transactions. In the interbank market, the preferred instrument was the synthetic outright-forward resulting from the combination of a spot transaction and foreign exchange swap. Nonetheless, the scale of transactions in the outright-forward market grew from PLN 8.3 billion in 1998 to PLN 50.6 billion in December 2001, i.e. by 509.6% (Figure 52).

In the future, the growing demand on part of non-bank entities can exert a decisive influence on the development of forward foreign exchange market. This allows to assume that both the scale of transactions and the liquidity of the market will increase.

**Figure 52. Gross turnover in the interbank fx market**  
(foreign currency - PLN)



Source: Reports of money market dealer banks and applicants for the function.

### 5.2.2. Foreign exchange futures

#### *Basic characteristics of the instrument*

Foreign exchange rate futures contract is an agreement between two parties, which promise to settle the differences between the future price of the contract and its initial price.

In 1998-2001, foreign exchange rate futures were traded in the three exchange markets: Warszawskiej Giełdzie Towarowej S.A. (Warsaw Commodities Exchange, WCE), Giełdzie Papierów Wartościowych S.A. w Warszawie (Warsaw Stock Exchange, WSE) and Polskiej Giełdzie Finansowej (Polish Financial Exchange, PFE)<sup>37</sup>.

All foreign exchange futures contracts traded in the organized exchanges in Poland are settled in cash (the settlement is conducted through payment of price differentials) without the

**Table 23. Standard characteristics of the foreign exchange futures on WSE, WCE and PFE.**

Characteristic	WSE	WCE	PFE
<b>Futures on USD</b>			
Underlying instrument	USD/PLN exchange rate	USD/PLN exchange rate	USD/PLN exchange rate
Standard nominal value of the contract	10,000 USD	10,000 USD	50,000 USD
Trading unit	PLN/100 USD	PLN/USD	PLN/USD
Price tick	0,01 PLN/100 USD	0,001 PLN/USD	0,0001 PLN/USD
Execution months	3 closest months + 2 following months of the March quarterly cycle (March, June, September, December)	Current month, 2 following months and the last months of 3 following quarters	3 closest calendar months + 3 following months of the March quarterly cycle (March, June, September, December)
Settlement method	Cash in PLN	Cash in PLN	Cash in PLN
<b>Futures EUR exchange rate</b>			
Underlying instrument	EUR/PLN exchange rate	EUR/PLN exchange rate	EUR/PLN exchange rate
Standard nominal value of the contract	10,000 EUR	10,000 EUR	50,000 EUR
Trading unit	PLN/100 EUR	PLN/ EUR	PLN/ EUR
Price tick	0,01 PLN/100 EUR	0,001 PLN/EUR	0,0001 PLN/ EUR
Execution months	3 closest months + 2 following months of the March quarterly cycle (March, June, September, December)	Current month, 2 following months and the last months of 3 following quarters	3 closest calendar months + 3 following months of the March quarterly cycle (March, June, September, December)
Settlement method	Cash in PLN	Cash in PLN	Cash in PLN

Źródło: GPW, WGT, PGF.

<sup>37</sup> In January 2002, the Polish Financial Exchange was taken over by CeTO.

physical delivery of the underlying instrument. On the WCE and the PFE, futures are quoted as price of USD 1, while on the WSE as the price of USD 100. Table 23 presents a comparison of the most important characteristics of trade on the three markets: WSE, WCE and PFE.

#### **Market size**

The size of the fx futures market, as measured by the number of open positions<sup>38</sup>, is relatively small. In 2000, the activity of investors in the foreign exchange futures market on WCE declined substantially (almost by half). The number of open positions fell almost 9 times. The trend reversed in 2001, when the number of open positions doubled.

**Table 24. Number and value (PLN mil) of open positions\* as of end of December, 1999-2001**

Exchange	1999		2000		2001	
	Number	Value	Number	Value	Number	Value
WSE	515	28.8	230	9.41	478	30
WCE	1,292	n.a.	521	n.a.	61	n.a.

\* A product of the number of open positions and daily settlement price of the contract.

Source: WSE data, WGT.

#### **Market organization**

The WSE was the first market to start the trade in exchange futures in September 1998. The traded instruments were American Dollar futures. In May 1999, WSE began offering euro foreign exchange rate futures.

The second exchange to start trading futures, was Warsaw Commodities Exchange (WCE), which won a dominant position in the market. Polish Financial Exchange started trading in foreign currency futures in December 1998, however its share in the market is very small.

Futures are traded on the WCE between 9.15 a.m. and 3 p.m. in an *open-outcry* system (transactions are executed directly on the floor). On the WSE, foreign currency futures were initially traded during session held between 1 p.m. and 3 p.m., during the sessions for index contracts. Starting from January 1999, the trading in foreign currency futures was conducted during extended sessions (1 p.m. to 4 p.m.). The introduction of WARSET in November 2000 improved the efficiency of trading. Trading sessions were significantly extended and currently they last from 9 a.m. until 4.10 p.m.

On the WCE, trade is conducted by the so called independent brokers. They conclude transactions in their own name and for their own account. WSE, in turn, introduced market makers to provide liquidity to the market. Direct access to the market is granted to brokerage houses, through which investors may trade.

#### **Settlement and depository system**

The clearing and settlement system of the WCE includes the clearing participants, i.e. brokerage houses and banks. The function of a clearing house for the contracts traded on the WSE is performed by National Depository of Securities SA. On PFE, the clearing and settlement functions were performed by the lead members (banks-shareholder of the company).

#### **Market participants**

Individual investors play a dominant role in the foreign currency futures market. The number of transactions concluded by institutional investors is quite small. Banks and other companies prefer the over-the-counter outright-forward market, which is more liquid, more effective and cheaper.

<sup>38</sup> It is the number of executed transactions as of the end of the period (day, month).

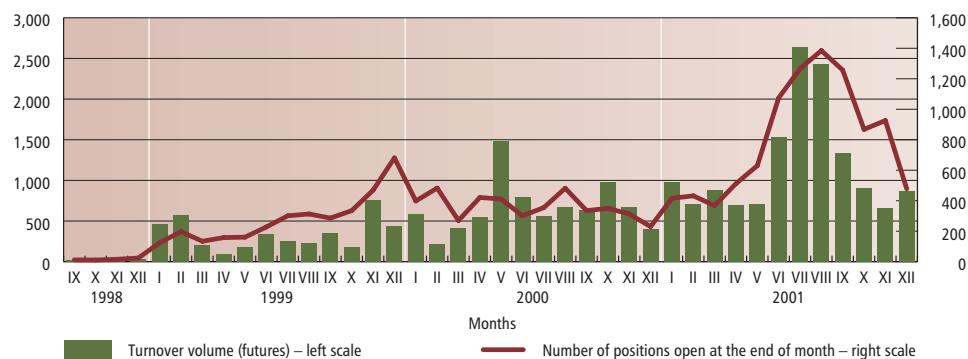
**Table 25. Share of investors in the WSE futures market turnover (in %)**

Investors	1999	2000	2001
Domestic	96	98	98
Foreign	4	2	2

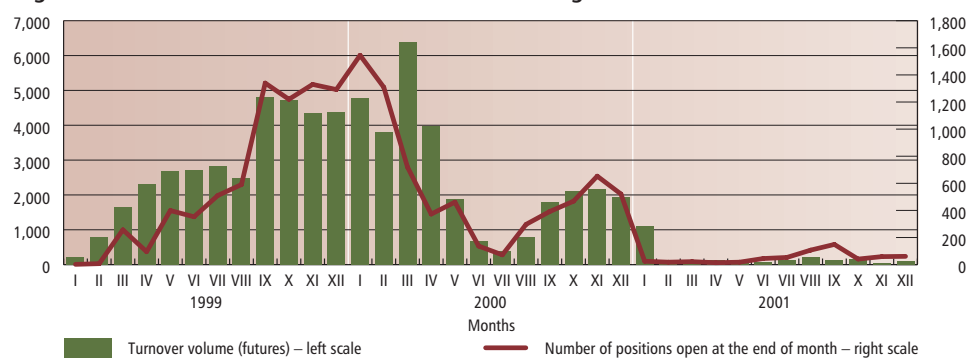
Źródło: dane GPW.

*Market liquidity*

According to the data presented in Table 26, initially the most popular instrument among investors were US dollar futures, which were traded on the WCE. The situation was similar in the case of euro futures. In the following years, this trend reversed. The WCE lost its position of the market leader in the foreign exchange derivatives market. The WSE enjoyed at the same time a substantial increase in US dollar and euro futures. The PFE did not record a single transaction on the instrument (Figures 53 and 54).

**Figure 53. Fx futures on the WSE**

Source: WSE data.

**Figure 54. Fx futures on Warsaw Commodities Exchange**

Source: WCE data.

The main reason for the decline in investors interest in this type of contracts is the taxation of income from futures trading, since foreign currency exchange rate futures contracts are not treated, under the Law on Public Trading in Securities, as securities. The reasons for the underdevelopment of foreign exchange futures are similar to the ones mentioned in the chapter on interest rate futures.



**Table 26. Value of the turnover on WSE, WCE and PFE in 1998-2001 (PLN million)**

Market	1998	1999	2000	2001
<b>WSE</b>				
EUR	–	168	424	565
USD	5.04	186	253	590
<b>WCE</b>				
EUR	–	778	359	n.a.
USD	–	967	541	n.a.
<b>PFE</b>				
EUR	–	4.4	3.4	0.0
USD	–	45.5	47	0.0

Source: WSE, WCE, PFE data.

### 5.3. Derivatives on stocks

Futures on stock market indices and individual stocks allow for an effective hedging of investment portfolios against changes of equity securities prices. The first to be traded was the futures contract on the WIG20 index. Two years later, the futures contracts on the TechWIG index had its debut at the WSE. The last ones to be traded were futures on individual stocks.

In case of a fall in stock prices investors do not have to sell stocks. They may hedge themselves through selling futures on stocks. This is particularly important in case of large investors, whose involvement in the stock market is increasing.

#### 5.3.1. Price risk in stock market

##### *Basic characteristics of the instrument*

Index futures are agreements between the two parties on setting the difference between future value of an index and its value on the day of the transaction. Public trading in index futures was initiated by the Warsaw Stock Exchange. In January 1998, futures on WIG20 were listed. In August 2000, the WSE introduced a new type of futures contracts on TechWIG index. The main characteristics of the index futures are presented in Table 27.

**Table 27. Standard characteristics of the WSE index futures**

Characteristics	WIG20 Futures / TechWIG Futures
Underlying instrument	WIG20 index / TechWIG index
Multiplier	PLN 10
Value of a contract	Multiplier x price of the contract
Trading unit	Index points
Price tick	1 index point
Execution month	Three closest months from the cycle "March, June, September, December"
Settlement method	Cash settlement in zlotys

Source: WSE data.

##### *Market size*

In 1998 the development of the WIG20 futures market was relatively slow. Starting from 1999, a substantial increase of the interest in the instruments was noted. The most dynamic growth

**Table 28. Average number and value of open positions in index futures on WSE**

Instrument	31.12.1998		31.12.1999		31.12.2000		31.12.2001	
	A	B	A	B	A	B	A	B
WIG20 Futures	385	4.8	3,232	49.2	8,055	160.6	13,443	178.8
TechWIG Futures	-	-	-	-	622	8.7	424	4.0

A – average number of open positions during the year according to end of month data

B – average value of open positions during the year, calculated according to end of month data (PLN million)

Source: WSE data.

of the WIG20 futures market occurred in 2000-2001. The average number of open positions increased from 385 in 1998 to 13,443 in 2001, which marks a 35-times increase. Despite its growth, the market is still relatively small. The average value of open positions in 2001 was around PLN 178 million.

In case of the TechWIG futures, the trade is smaller. The market did not develop as dynamically as the WIG20 futures market. In 2001, a 32% decline in the average number of open positions was recorded. The average value of an open position also declined, by 55%.

#### *Market organization*

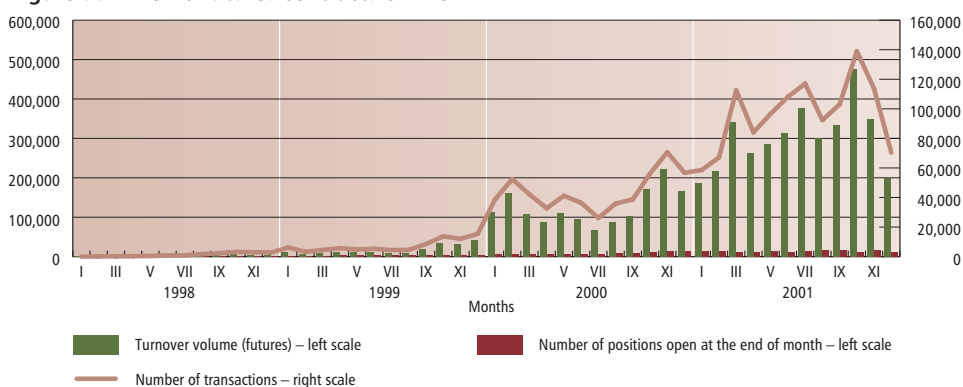
In 1998, WIG20 futures were listed on the WSE in the continuous trading market, from 1 p.m. to 3 p.m. Starting from January 1999, the trading hours for contracts have been extended by an hour (1 p.m. – 4 p.m.). Starting from April 1999, the futures contracts were traded from 11.45 a.m. From August 1999, the futures trading sessions begin at 10.45 and end at 4 p.m. To provide liquidity to the market, some of the brokerage houses participating in trading, perform the functions of market makers.

#### *Settlement and depository system*

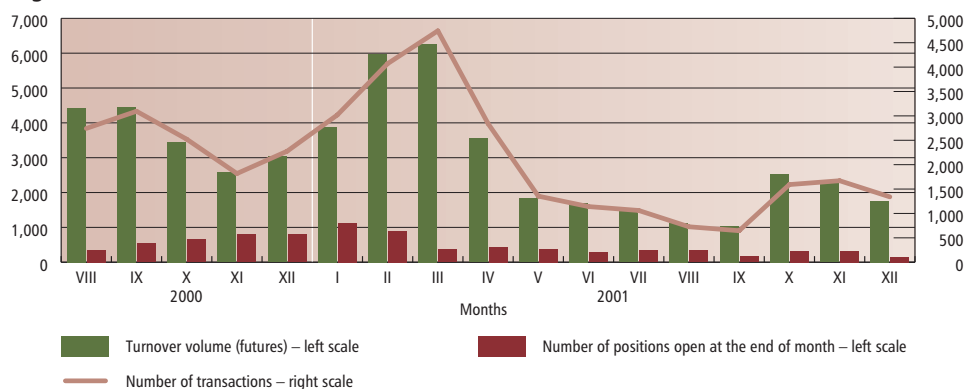
To assure safety of trading and to guarantee the settlement of transactions, a separate Derivative Instruments Settlement Chamber (DISC) was established within the National Depository of Securities. After each session on the WIG20 futures contracts market, DISC settles open positions of each investor. Depending on the futures price fluctuations, the account of the investor is credited or debited with an appropriate amount. Every day the DISC estimates the influence of market price change on the value of open positions (mark to market).

#### *Market liquidity*

The volumes of trade in the WIG20 futures market were constantly growing since 1998. This growth was due to the high volatility of stock prices. In 2000, the volume of trade in WIG20 contracts increased by 631% compared to 1999. In 2000, 525,172 transactions were executed

**Figure 55. WIG 20 futures contracts on WSE**

Source: WSE data.

**Figure 56. TechWIG futures on WSE**

Source: WSE data.

**Table 29. Turnover volume and value of futures on WSE indices**

Instrument	1998		1999		2000		2001	
	A	B	A	B	A	B	A	B
WIG20 Futures	597	24,298	6,015	203,843	57,390	1,490,005	95,932	3,646,528
TechWIG Futures	–	–	–	–	540	17,925	636	33,444

A – value of turnover (in PLN million)

B – volume of turnover (units)

Source: WSE data.

and the average volume was 3 contracts. In 2001, the WIG20 futures market enjoyed further growth. The volume increased by 145% and 1,167,989 transactions were concluded. The low value of a single transaction results from the composition of investors, where the dominant role is played by individuals. In 2000, an interesting phenomenon was observed, when the futures market turnover exceeded the turnover of the spot market. This was caused mainly by the decreasing liquidity of the stock market, which moved investors to the futures market. In 2001, a similar trend was observed.

The total volume of TechWIG futures increased by 87% in 2001, compared to 2000. The average volume, however, declined from 170 to 134 contracts. In 2000, 12,454 transactions were concluded, while 24,210 transactions were concluded in 2001.

### 5.3.2. Futures on stocks

A futures contract on stocks of individual companies is an agreement between two parties, under which one party promises to purchase and the other to sell a pre-agreed number of underlying instruments, i.e. shares of a given company, at a given time and at a pre-agreed price.

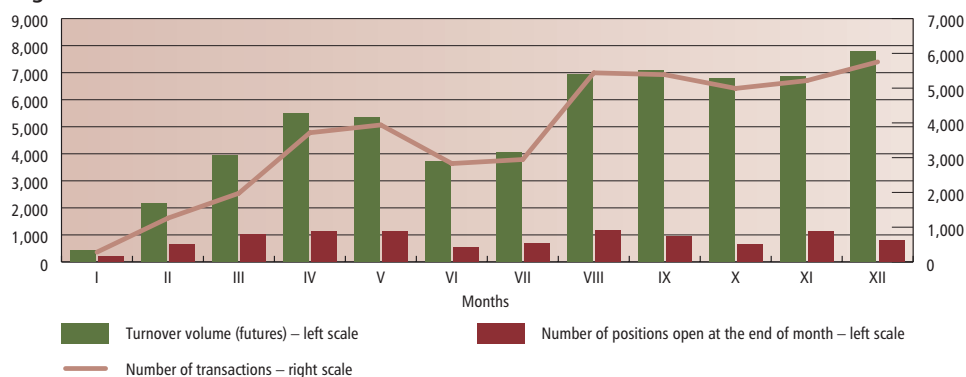
The first futures on stocks were introduced by the Warsaw Stock Exchange in January 2001. The underlying instruments for the contracts were the shares of the largest stock companies: Telekomunikacja Polska S.A., PKN ORLEN and Elektrim. In October 2001, futures on shares of the next five companies were listed. These contracts, similarly to other derivatives, are listed in the continuous trading market. NDS is responsible for the settlement and guaranteeing of transactions. Detailed characteristics of the futures are presented in Table 30.

Futures on stocks, despite a short history of the instrument, became very popular among investors, mainly individual investors. The volume of turnover exceeded the volumes of foreign currency futures which are traded at WSE. From January to December 2001, the volume increased seventeen times (Figure 57).

**Table 30. Select standard characteristics of the futures on WSE listed stocks**

Characteristics	Futures on shares of stock of companies
Underlying instrument	Shares of: TP S.A., PKN ORLEN, Elektrim, KGHM, AGORA, BRE, Bank Pekao S.A., PROKOM
Number of shares per contract	KGHM, PKN ORLEN, TP S.A. – 500 shares; Elektrim – 300 shares; AGORA – 200 shares; BRE, Bank Pekao S.A., PROKOM – 100 shares
Value of contract	Price of the contract x number of shares per contract
Trading unit	In PLN (per share)
Price tick	PLN 0.1
Month of execution	Two closest calendar months and one month from the March quarterly cycle
Method of settlement	Cash in PLN

Źródło: dane GPW.

**Figure 57. Futures on stocks in 2001**

Source: WSE data.

**Table 31. Select statistics of stock futures on WSE companies**

Month	Turnover value (in PLN million)	Volume	End of month value of open positions (in PLN million)	End of month number of open positions	Number of transactions
January	10.91	423	2.43	189	282
February	52.1	2,181	6.55	645	1,260
March	73.91	3,921	8.55	1,007	1,977
April	100.62	5,479	10.31	1,142	3,717
May	102.49	5,350	11.12	1,110	3,941
June	63.77	3,704	4.38	519	2,831
July	59.81	4,045	5	675	2,947
August	94.42	6,930	8.17	1,161	5,440
October	94.04	7,085	7	927	5,387
September	94.65	6,802	3	663	4,992
November	92.85	6,868	6	1,135	5,215
December	83.05	7,769	3	779	5,754
Total	923	60,557	x	x	43,743

Source: WSE.

#### 5.4. Instruments for management of price risk in credit and bond market

There are many types of swap operations in the developed markets. In the analyzed period, the domestic market offered mainly foreign exchange swaps, interest rate swaps and cross-currency

interest rate swaps. Since foreign exchange swaps are used in Poland mainly as a quasi-deposit type instrument, they were discussed in the section concerning the money market.

#### 5.4.1. Interest rate swaps

##### *Basic characteristics of the instrument*

*Interest rate swap* (IRS) is an agreement on the exchange of interest payments (fixed against floating). The parties of the transaction do not swap the principal.

The first interest rate swaps in PLN were concluded in London interbank market around 1998. In the domestic market, the first interest rate swaps were offered in 1999. By mid-1999, IRS transactions on WIBOR 6M (as the reference rate for variable interest payments) became a standard in Poland. WIBOR 3M was a less frequently used reference rate. Typical maturities for IRS range from 1 year to 10 years. Less frequent are quotations of 15 and 30-year IRS, mainly with non-bank clients in London interbank market, and the market for them is illiquid. Standard IRS size equals PLN 50 million.

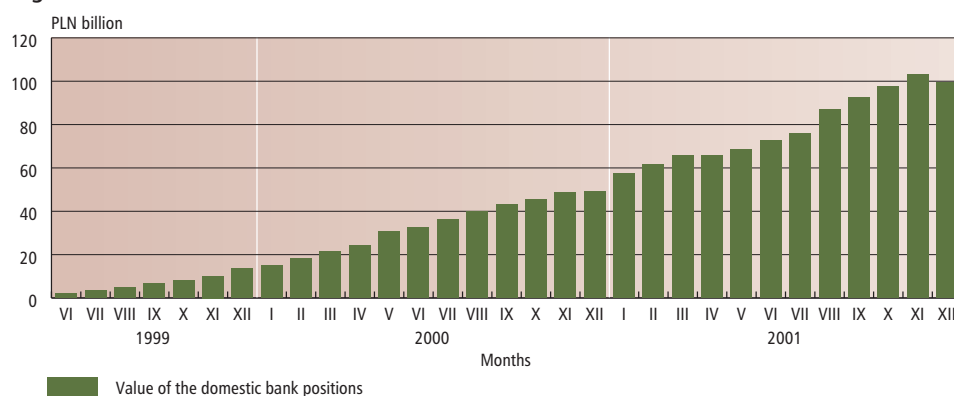
In Poland, the variable swap rate is calculated according to actual/365 days convention, while the fixed rate is based on *actual/actual* convention<sup>39</sup>.

Basing on the reports from banks, majority of IRS transactions is classified as speculative. Hedging transactions constituted approximately 15% of the total value of bank IRS portfolios in the analyzed period.

##### *Market size*

Information about the value of active swap positions of the domestic banks are available since June 1999. Until December 2001, the engagement of the entire Polish banking system in the IRS transactions increased significantly. The nominal value of closed contracts (the sum of amounts purchased and sold, excluding the amounts purchased by residents) increased from PLN 2.2 billion to PLN 99.6 billion. This was largely a result of a growth in the number of long-term IRS contracts in bank portfolios, which did not mature in the analyzed period. The largest increase in the number of contracts concluded was recorded in August 2001, when the nominal value increased by approximately PLN 11 billion (Figure 58).

**Figure 58. IRS market**



Source: Monthly information from banks.

<sup>39</sup> The *actual/365* and *actual/actual* calculation conventions inform, what is the length of the calculation period and the length of the year, e.g. for the calculation of prices, yield, accrued interest. *Actual/365* indicates that the variable swap rate is calculated with the use of actual number of days for which the swap is executed and a 365-day year. *Actual/actual* indicates that to calculate fixed swap rate, the actual length of the transaction period and the actual number of days within a year are used.

### Market organization

Interest rate swaps are traded in the interbank market. Both in the domestic market and in London there are groups of banks performing the functions of market-makers (so called *swap-houses*). They offer a possibility of trading also with non-bank clients.

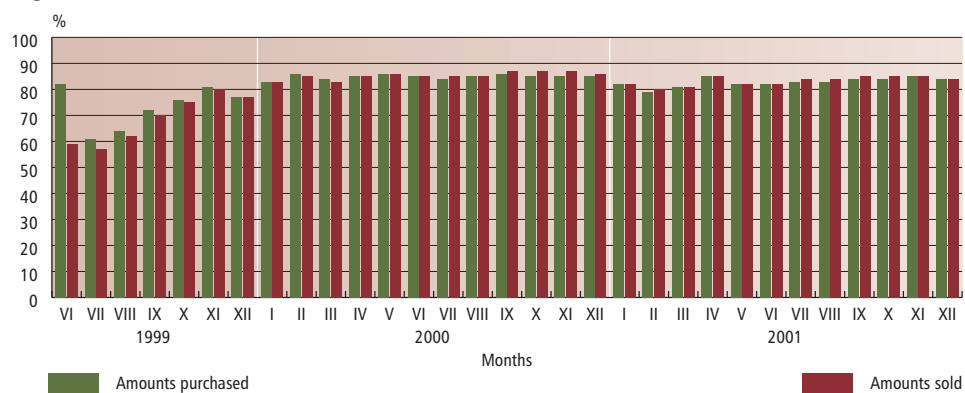
The degree of concentration of the domestic interest rate swap market, as measured by the share of 5 most active banks in the total turnover, reached approximately 93% in 2001.

### Market participants

Interest rate swap market is dominated by foreign investors. According to the estimates of institutions active in the London interbank market, approximately 85% of transactions are concluded between foreign entities.

The analysis of positions of Polish banks confirms that the majority of IRS are executed with non-residents. Starting from January 2000, the share of foreign entities in the IRS transactions stabilized at the level of 84% (Figure 59).

**Figure 59. IRS market (the share of transactions with non-residents)**



Source: Monthly information from banks.

### Market liquidity

The turnover in the IRS market is included in bank reports since 2001. Data received from money market dealer banks suggest that the turnover was highly volatile in 2001, reaching the highest levels in May, June and December and the lowest in October and November. Monthly gross turnover varied from PLN 4.1 billion and PLN 12.7 billion, with the average of PLN 7.7 billion for the entire 2001.

Transactions are executed in the interbank market. In the opinion of the dealers, the IRS market is less liquid than the FRA market. One of the reasons for the lower liquidity is the fact, that in the case of FRA contracts the underlying instruments (foreign exchange swaps) are more liquid than the T-bonds, which are underlying instruments for IRS. However, the most important reason is that in case of long-term transactions (IRS), the risk of the counterparty's insolvency is, by its nature, much greater than in the case of short-term transactions (FRA). Therefore, the IRS market involves a limited number of players having sufficiently high creditworthiness. This group includes large London banks and several domestic banks.

#### 5.4.2. Cross-currency interest rate swaps

##### Basic characteristics of the instrument

CIRS is a combination of interest rate swap and foreign exchange swap. The parties of the swap exchange the principal amounts the spot exchange rate. During the life of the swap, the

counterparties make interest payments in two currencies. The agreement is settled mostly through the exchange of principal amounts.

In case of the exchange of fixed rate against floating rate (mainly the transactions of banks with non-bank clients), the minimum value of CIRS contract varies from PLN 0.5 and 3 million (depending on the bank). Typical maturities of such transactions range from 1 to 10 years. Payment streams are based on 1, 3, and 6-month WIBOR/LIBOR. Interest payments are made every 1, 3, 6 or 12 months (payer of the fixed rate) and 1, 3, or 6 months (payer of the variable rate).

In case of basis swaps (subject to transactions in the interbank market), the minimum value of the transaction equals USD 25 million. Typical maturities for such transactions range from 1 year to 10 years. Payments are usually based on 3 or 6 month WIBOR/LIBOR/EURIBOR. Interest payments are made every 3 or 6 months.

Data regarding the currency structure of the transactions, although they are incomplete, indicate that the EUR and USD have a similar share in the total number of transactions. A higher proportion of EUR transactions could be observed in case of securing foreign currency payments by residents, which is most probably connected with the currency structure of the eurobonds issued by Polish entities.

#### **Market size**

Total market size, measured by the nominal value of contracts in the portfolios of Polish banks, equaled PLN 9.5 billion in December 2001. The above data include basis swaps and transactions where fixed rate is swapped against floating rate.

#### **Market organization**

CIRS transactions, where fixed rate is swapped against floating rate, are offered mainly for bank clients.

Basis swaps are subject to transactions in the interbank market, mainly as transactions between domestic and foreign bank. Such transactions are sporadic and the terms of such transactions are negotiated directly (by telephone) between the parties.

#### **Market participants**

In the domestic market one bank has a dominant position, controlling over 50% of the market. In London, there are 5 – 6 active banks. The most important players in the market are investment banks, which results from the fact, that CIRS transactions are concluded for longer terms, which fits the term structure of investment banks liabilities.

The share of contracts with domestic entities in the domestic banks portfolio equaled 45% at the end of 2001. The remaining transactions were concluded with foreign entities. Domestic entities used CIRS to hedge their foreign currency payments (74% of transactions). Foreign companies were using CIRS mainly to hedge their future PLN payments (66% of contracts).

Domestic counterparties in CIRS transactions are mostly the largest telecommunication industry companies, which fund themselves in the international market and use the instrument to hedge against foreign exchange rate and interest rate risk. Larger transactions included: TP SA in 1997 (USD 100 millions, 7 years) and June 1999 (USD 300 millions, 4 years), Polkomtel in 1999 (USD 90 millions and EUR 95 million, 5 years), Elektrim S.A. (EUR 220 million, 5 years)<sup>40</sup>.

#### **Market liquidity**

The turnover in the CIRS market was not included in the previous bank reporting system. Accordingly, the NBP does not have exact information on the scale of transactions and the liquidity of the market. In case of contracts, where fixed rate is swapped against floating rate, there are no standard contracts. In case of basis swaps, the informative quotes are available on brokers' web pages.

<sup>40</sup> Source: "Rynek terminowy" no 2/2000.

## 6

### Options market

#### 6.1. Interest rate options

##### *Basic characteristics of the instrument*

Interest rate option is an instrument which gives the buyer the right to buy (*call option*) or sell (*put option*) interest rate assets at a pre-determined price. The price of the option is the premium payable on the second day after the conclusion of the transaction.

Futures contracts on WIBOR rate are usually the underlying assets for interest rate option. Banks and brokers are quoting volatility of prices of underlying assets. The emergence of the interest rate option market in Poland is dated back to 1998-1999.

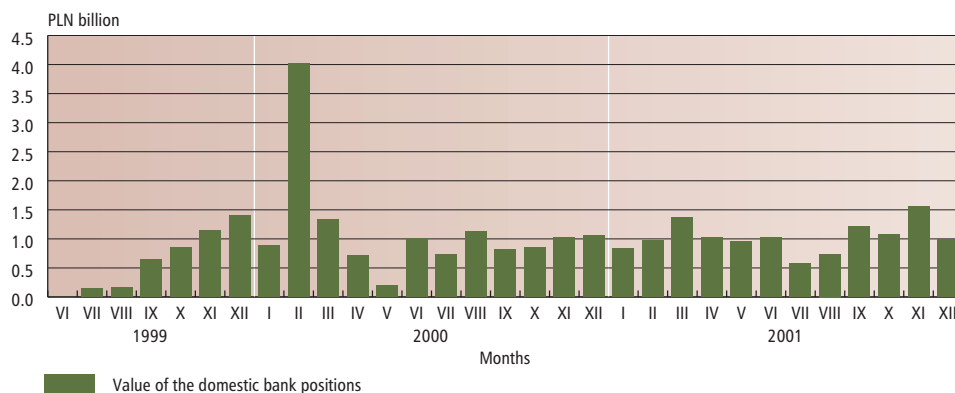
##### *Market size*

The exposure of the entire banking system, measured as the average value of concluded contracts, increased from PLN 0.6 billion in 1999 to PLN 1.1 billion in 2000. In 2001, the average value of contracts was slightly lower than in 2000 (by approximately PLN 1 billion). The average value of transactions in 2001 suggests that the interest rate option market development has stopped. The main factor limiting the market development is the lack of significant interest of non-bank institutions in this type of instrument.

The engagement level in particular months varied substantially, e.g. in February 2000, the value of contracts exceeded PLN 4 billion. In the second half of 2000 and in 2001, monthly volumes of transactions were less volatile and reached the average level of PLN 1 billion (Figure 60).

According to the information from monthly reports of banks, the average value of interest rate options offered in the market declined to PLN 0.1 billion.

**Figure 60. Interest rate options**



Source: Monthly information from banks.



### *Market organization*

The interest rate option market is an over-the-counter market. Options are written by banks. PLN denominated options are also written by London investment banks.

### *Market participants*

Domestic and foreign banks participate in the market. As opposed to foreign currency options, the dominant role in the market for interest rate options is played by domestic entities. Among domestic participants banks were the dominant players. The engagement of non-bank institutions was increasing in the period of expectations for the increase of interest rates and declining in the periods of expectations for interest rates declines.

The share of foreign institutions in the options market, as measured by the value of contracts with the domestic banks, was stable throughout the period and did not exceed 6% in 2000-2001.

### *Liquidity of the market*

The value of the turnover in the options market was not included in the bank reporting requirements in the analyzed period. The information obtained from market participants indicate that the interest rate options market in Poland was much less liquid than the foreign exchange options market. Due to the low liquidity of the market, the spreads were as a rule much higher than in the foreign currency options market. Transactions were concluded sporadically. The average value of transactions equaled approximately PLN 25 million.

## 6.2. Foreign exchange rate options

### *Basic characteristics of the instrument*

Foreign exchange option is an instrument giving the buyer the right to buy or sell foreign currency in the future at a pre-determined exchange rate. The price of an option is a premium, which is payable in advance. The source of information about the prices of the options are dealers quotations, which are published in the form of the so called implied volatilities. From a technical standpoint, implied volatility is the value of volatility parameter in the Garman-Kohlhagen formula<sup>41</sup>, used in foreign exchange options pricing. Volatility levels for particular *out-of-the-money* (OTM) options are estimated on the basis of the three basic strategies in the interbank market: *straddle*, *strangle*, *risk reversal*. Banks and brokers quote the volatilities of the ATM combination of *straddle* (*at-the money-forward*) options, and, less frequently, the *risk reversal* volatility. Other popular strategies present in the interbank market, apart from the three aforementioned, are: *fly*, *call spread* and *put spread*.

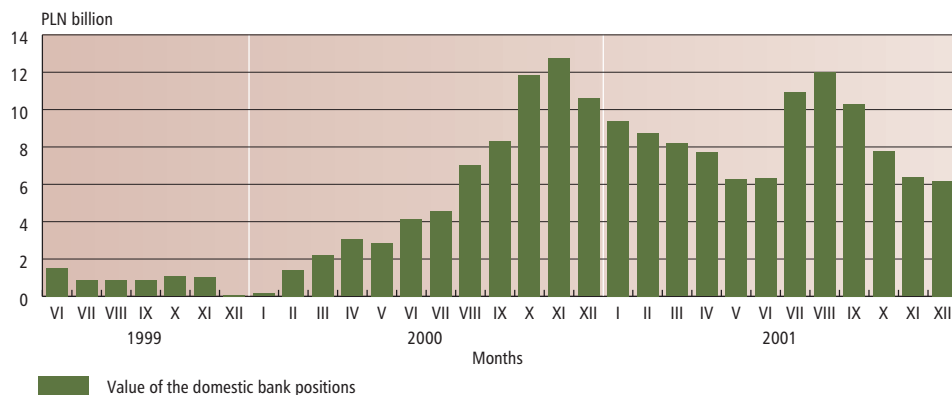
Clients (banks, which only buy options and do not write options and non-bank entities) prefer to buy entire option strategies to buying particular options. The benefit of such solution is the lower cost of purchase. Another benefit of buying a strategy is the possibility of shaping profit making profiles and loss limiting profiles depending on individual needs. The most popular standard strategies offered by banks to their clients are: *straddle*, *risk-reversal* and *sea-gull*.

Banks offer options contracts with maturities from 1 week to 1 year.

### *Market size*

The level of engagement of the entire banking system, measured as the value of contracts concluded (buy/sell), increased from PLN 1.5 billion in June 1999 to PLN 6.4 billion in December 2001. The highest volumes were recorded in November 2000 and in August 2001 (approximately PLN 12 billion). A clear rising trend started after the floating of the zloty (Figure 61).

<sup>41</sup> The Garman-Kohlhagen model is a modification of the Black-Scholes model for foreign exchange options.

**Figure 61. Foreign exchange options**

Source: Monthly information from banks.

### *Market participants*

Both domestic and foreign bank participants of the option market may be divided into the two groups: *market-makers* and *market-users*. The first group is constantly present in the interbank market, actively quoting the prices of most liquid option strategies. The users group includes banks which are intermediaries between market-makers and other entities.

Information obtained from market participants suggests that corporates are rarely using foreign exchange options due to the high cost of the instrument in comparison with outright forward transactions, executed in the foreign exchange market and due to the lack of the experience.

### *Market organization*

The fx options market is a typical dealer market. None of the exchanges offers fx options. Options are offered for sale by domestic and foreign banks.

### *Market liquidity*

There is not enough information regarding the volume of turnover in the fx option market. Although the turnover in the fx options market is assumed as significantly higher than on the interest rate option market.

Some previously active participants withdrew from the fx options market. Some of them (banks with the majority foreign ownership) transfer their risk desks to their headquarters located in large financial centres (London, Frankfurt). Polish subsidiaries of these banks become simply selling agents. This process is typical not only for the Polish market, but is a general trend observed worldwide. Many domestic banks are only market users. This is caused by the risk aversion of the management boards of the banks and an attempt to realize "safe" profits from operations with clients.

## 6.3. Options on securities

### *Basic characteristics of the instrument*

A securities option gives the buyer a right to buy or sell the underlying instrument (stock, debt security) at a pre-agreed price. The price of the option is called the premium. Options are traded in the over-the-counter market in Poland.

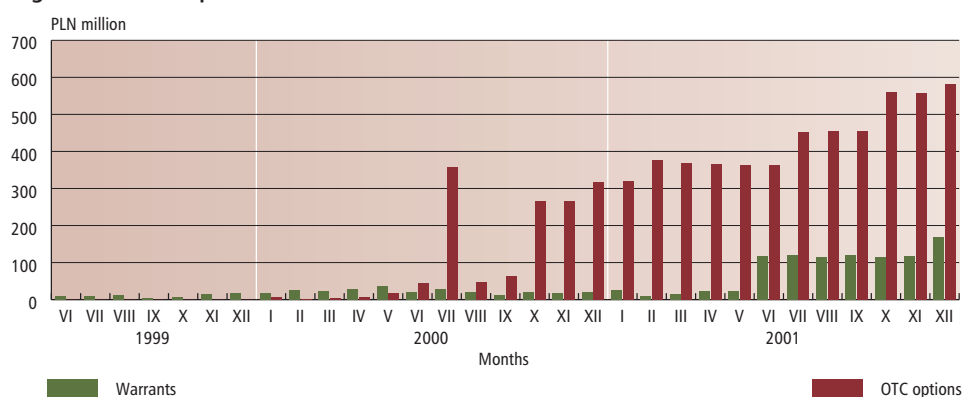
An instrument, which has many characteristics common with the option, and which is traded at a stock exchange is warrant. Warrant is a financial instrument, the price of which depends on the price or value of the underlying instrument. Warrant is an unconditional and irrevocable obligation of the issuer to pay the owners the settlement amount.

In case of a call warrant it represents the differential between the price of the underlying instrument and the execution price determined by the issuer. In case of the put warrant, the settlement amount is the differential between the execution price and the price of the underlying instrument. Apart from financial settlement, the settlement of a warrant may be executed by a delivery of the underlying instrument at the agreed strike price. Warrants were listed in 1997 at the Warsaw Stock Exchange.

### Market size

The open position of the entire banking system, which indicates the market size was small in the analyzed period. In June 1999, the value of open positions in the banking system (warrants traded on the WSE and over-the-counter options) reached PLN 8.5 million and increased to PLN 750.1 million by the end of 2001 (Figure 62).

**Figure 62. Stock options**



Source: Monthly information from banks.

### Market organization

Banks offer the securities options to clients. The interbank market practically does not exist.

Warrants may be issued by banks and other financial institutions. The underlying instrument are stocks of publicly traded companies. The market maker applies for permission to introduce the instrument into public trading to the Securities and Exchange Commission. Together with the application, the "Conditions of issue and trading" are presented to the SEC, which contain the detailed information regarding the warrants, which will be listed on the stock exchange. The execution of warrants on stocks may only be realized through the cash settlement. The National Depository of Securities is the clearing chamber for the instrument. Warrants are traded in the continuous trading system for the derivatives market. The instruments were introduced by the Warsaw Stock Exchange. The first listing was organized in March 1997. Warrants were offered for sale by the BRE Bank S.A. These were European call warrants on shares of Elektrim S.A. and the NIF index. In October 1999, the WSE introduced new European call and put warrants on WIG 20 index and on the shares of the next 10 companies. In 2000, the WSE began to trade warrants on stocks. The issuer of the warrants was Beskidzki Brokerage House (BDM). In February 2001, the warrants on TechWIG index, issued by BRE Bank SA were listed. In May 2001, the WSE introduced new call and put warrants on 52-week Treasury bills, TechWIG index and on sectoral sub-indices of the WIG index. The issuer of the new warrants was Central Brokerage House of Pekao S.A.

Until October 2000, warrants were also traded on CeTO. The first instruments of the type were introduced in March 1998. They were American type call options on IB5 index (index of 5 stock exchange listed banks) and IM10 index (mixed index of 10 stock exchange companies). BRE Bank S.A. issued these warrants. In the second half of 1998, Beskidzki Brokerage House issued

European call and put warrants (for the first time) on KGHM Polish Copper S.A. stock. In January 1999, the trading in European call and put warrants on BIG Bank Gdanski S.A. stock, issued by Beskidzki Brokerage House was initiated. In March 1999, BRE Bank S.A. issued European call and put warrants on USD exchange rate. The trading in warrants was conducted in the continuous trading system between 9 a.m. and 3 p.m.

#### *Market participants*

Options on securities were offered in Poland by 5-6 banks in 2000. The analysis of their off-balance sheet positions suggests, that the securities options were purchased mainly by domestic entities, and the zloty was the settlement currency.

Three issuers are currently active in the warrants market: BRE Bank SA, Beskidzki Brokerage House SA and Central Brokerage House of Pekao S.A. The National Bank of Poland does not have information on investors in warrants.

#### *Liquidity of the market*

There is no information about the scale of transactions in the over-the-counter options market. Due to small size of the market, the assumption that its liquidity is low seems justified. In the analyzed period, only one bank regularly maintained an open position (most frequently the sale of call options in transactions with residents and denominated in PLN). Information appeared sporadically, on a simultaneous exposure of two banks. Only in October and November 2000, three banks informed about open option positions (hedging options).

Also the warrants market on the WSE has been developing very slowly. Despite a variety of underlying instruments warrants are not popular among investors. The more popular in the exchange market are the call warrants (57% share in total turnover in 2001).

**Table 32. Trade in warrants on the WSE**

Indicator	1998	1999	2000	2001
Number of trades per session	5	51	76	29
Total value of turnover (in PLN million)	2	15	72	20
Average turnover per session (in PLN thousands)	11	59	287	82

Source: WSE data.

**Table 33. Composition of warrants turnover in 1998-2001**

Warrants	1998	1999	Share (in %) 2000	2001
Stocks	20	49	65	59
NIF	80	31	6	2
WIG20	n.a.	20	29	32
Others	n.a.	n.a.	n.a.	7

Source: WSE data.

## 6.4. WIG20 participation units (MiniWIG20)

#### *Basic characteristics of the instrument*

WIG20 index participation units (MiniWIG20) were introduced to the Warsaw Stock Exchange on November 26, 2001. The instruments are similar in structure to the ETFs (*Exchange*

*Traded Funds*), the market for which is dynamically growing throughout the world. They are defined as a right of the buyer of a unit towards the seller, to demand the payment of an amount equal to the settlement amount of the index participation unit. In return, the issuer of the unit collects a premium from the buyer. The index participation units are derivative instruments. They are characterized by the following features:

- WIG 20 index is the underlying instrument,
- An inequality of rights and duties,
- Term to maturity equal to 25 years.

The price of a participation unit is close to the price of a share of stock, so the cost of purchasing such unit are much lower, than in the case of purchasing all the stocks which comprise WIG20 index. Another benefit of the index participation unit is the possibility to obtain profits when the value of the index declines (by selling MiniWIG20).

#### ***Market participants***

The offer of the Warsaw Stock Exchange is directed mainly to small and medium size investors.

#### ***Market organization***

Index participation units are traded in the continuous trading system from 9 a.m. to 4.10 p.m., Monday through Friday. Transactions are settled and guaranteed by the NDS. The Derivative Instruments Settlement Chamber (DISC) is the central counterparty to all transactions. Due to the long-term maturities of MiniWIG20, the National Depository of Securities allows for short selling such investors, who will be able to transfer the settlement amount to the party executing the contract.

#### ***Market liquidity***

In the period between November 26 and December 31, 2001, the value of index participation units turnover reached PLN 5.6 million, which constituted 0.01% of the total forward market turnover. The volume reached 22,343 index participation units, which constitutes 0.60% of the total volume of the derivatives market.

## 7

Perspectives of the development of the financial market in Poland<sup>42</sup>

*Liquidity of a market*, understood as an *ease to execute transactions* and the *low transaction costs* is a fundamental criteria of evaluation of the financial markets. The liquidity of a financial market improves with the increasing scale of transactions. An improving liquidity of the market tends to stabilize prices, which become less sensitive to temporary changes in the supply and demand.

Among the factors accelerating the development of the domestic financial market in Poland were: increasing integration with the international market and the social insurance system reform. Among the factors decelerating the development of the domestic financial market were most of all: insufficient demand from corporates for the financial management instruments, shortcomings of the infrastructure, legal problems and the competition from the foreign capital markets.

The basic barrier to the development of the domestic financial market in the period analyzed in the *Report* was the insufficient demand for financial instruments from corporates, which only begin to manage their finances. Only one market could be identified as relatively liquid due to the demand of corporates, which is the Treasury bill market used by corporates to manage their liquidity.

Demand for financial instruments from corporate sector is still too weak to support the liquidity of individual segments of the domestic financial market. Currently, the supply of financial instruments exceeds the demand. Many banks have prepared procedures permitting the offering of various financial instruments, but the procedures remain "dormant" in expectation for a demand from corporates.

Institutions with the highest demand for financial instruments are banks themselves. However, the interbank market itself does not always generate sufficient demand for a given market segment to become liquid. Therefore, some financial market segments are developing quite slowly, although they were established relatively early. A good example of such market is the market for fx options.

This situation will not change soon, if the financial management in corporates is not recognized as an activity which, to a large degree, determines their competitiveness. Examples can be quoted of the largest domestic firms, which still do not have financial risk management departments.

The insufficient domestic demand for financial instruments is partly filled by the foreign investors demand. Their activity in the domestic financial market is an important factor improving liquidity of the market.

A good example of the positive influence of the presence of foreign investors on the liquidity of the domestic financial market is the development of the synthetic interbank deposit market in the form of fx swap transactions. In a relatively short period of time, the fx swap market became the largest and the most liquid segment of the domestic money market.

The advantage of fx swaps over interbank depo market is that in the depo market there is a risk of insolvency of the counterparty, while fx swaps are in fact collateralized short-term loans. The fact that the interbank deposits bear credit risk, force banks to use limits imposed on the size of the loans in the depo market.

All this does not mean that the presence of foreign investors may become a *panaceum* for the weaknesses of the domestic financial market. One of such weaknesses is the absence of a liquid

<sup>42</sup> The chapter contains excerpts from the article: A. Slawinski *Development of the domestic financial market: unclear balance sheet*. "Rynek Terminowy" no 3/2001.

repo market. In the developed economies *repo* transactions constitute a basic form of short-term borrowing.

In Poland the repo market is still very small. Until recently the barrier to development of the market were relatively large transaction costs. The participation of foreign investors in trading improves the liquidity of the secondary bond market, but the improvement was not sufficient to compensate the costs of the settlement system.

The integration with the international market does not only improved the liquidity of the domestic financial market. Due to the process of globalization also “clones” of individual segments of the domestic financial market are emerging abroad. A good example of the phenomenon are eurobonds denominated in the zloty, which constitute competitive investment vehicle for domestic Treasury bonds, or the IRS contracts, which are synthetic zloty bonds traded in international market.

The development of the derivative markets, such as the IRS market, both provides the domestic businesses a possibility to hedge against the price risk and allows to improve the liquidity of the spot markets. An example is provided by the development of asset swap markets.

In 1997, the falling prices of bonds forced domestic banks to limit the volume of their trade in the secondary market. At that time, it was the only available method of avoiding realization of balance sheet losses caused by the falling bond prices. To avoid the losses, banks were moving T-bonds from their *trading portfolios* to *investment portfolios*. The securities were “disappearing” from the market.

In 2000, due to the development of the IRS market, the increases in interest rates and the resultant falls in the prices of Treasury securities did not produced a fall in trading in the secondary market. This was possible not only due to the fact that IRS market provided instruments enabling hedging against interest rate risk. It was possible due to the development of asset swap market, which improved liquidity of the bond market<sup>43</sup>. Additionally, profits from asset swap market enabled to cover losses taken in the bond market<sup>44</sup>.

It is worth mentioning that the FRA market developed due to the development of the fx swap market. In the absence of a sufficiently liquid interbank depo market, banks offering FRA transactions were able to hedge their risk in the fx swap market.

The development of the domestic financial market was stimulated by the social security system reform and the resulting creation of the pension funds. The emergence of this type of institutional investors resulted in the increased demand for the domestic stocks and bonds, which provided a stimulus for the development of the domestic capital market.

This potential opportunity is not fully utilized due to the restrictions imposed on pension funds investment policy. Pension funds in Poland are not allowed to use derivatives. In such situation pension funds are not able to protect their portfolios of stocks and bonds from the market risk. This creates a risk that a serious market turbulence would bring about losses in pension funds sector, which could undermine the confidence in social security reform.

The domestic financial market does offer derivatives which are needed by pension funds. Apart from the FRA and IRS contracts, which allow hedging against interest rate risk, there is a relatively liquid market for futures on stocks. Pension funds and other institutional investors demand could have become one of the engines of the derivative market development, as was the case in other countries.

Recently, pension funds were allowed to use some derivatives. However, with such a permission to use the derivatives pension funds should be obliged to risk monitoring systems, as is the case with banks (e.g. VaR) in order to control the risk they take in financial market.

<sup>43</sup> K. Łukasik: *The market for Treasury bills in 2000 in the aspect of liquidity management*. In *Money market in Poland. Conditions and perspectives*. Editor: A. Ślawinski. Gdansk 2001 IbmGR.

<sup>44</sup> R. Gluch: *Development of the Treasury debt securities market*. In *Money market in Poland. The conditions and perspectives*, op.cit.

Another factor, limiting the development of the domestic financial market, is the competition from foreign capital markets and the domestic banking system. The development of the capital market will be limited by the fact, that large domestic companies will continue to issue their stocks and debt securities in the international financial market.

The remaining companies creditworthiness is often too low to allow for the issue of corporate debt. A relatively rapid development of the short term debt instruments does not mean that there will be a similar development of corporate bonds market. The short-term commercial papers, which are currently issued, are often debt instruments of companies with relatively low financial standing. The yields on bonds issued by such companies would have had relatively high risk premium. In many cases the cost of issue of debt securities might have been higher than the interest on loans. Accordingly, banks, having lost their best clients, will do their best not to loose the remaining corporate clients. Therefore, it is probable that the domestic corporate bond market will emerge as a supplement to the bank credit.

The development of municipal bonds will be limited, until the central government budget becomes able to significantly increase the share of local governments share in tax revenues.

Recently, the development of the stock market was almost sopped. The main stimulus for the previous development was the privatization of state companies. With the completion of the process the natural stream of new listings will diminish. One of the factors decelerating the growth of the stock market is a relatively small number of large and domestic companies, for which it would be beneficial and profitable to be listed on the stock exchange. The attempts to develop a market for small companies were not successful so far.

In general, the characteristic feature of the development of the Polish financial markets was the emergence of relatively large and liquid interbank markets. The stock market was developing more slowly, which delays the perspective of the emergence of a sufficiently developed capital market in Poland, which would impose more market discipline on the efficiency on the micro level.



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## Appendices

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## Appendix 1

Market	Market size definition	Turnover size definition	Participant structure	Source of information
Treasury bills	Nominal value of instruments outstanding on a reporting day	Gross turnover, i.e. the nominal value of instruments bought and sold by all the market participants in a given period, excluding the turnover associated with repo and sell-buy-back operations	<b>Central Register of Treasury Bills</b> – portfolios and turnover, broken down into: – domestic banks – domestic non-bank entities – foreign entities <b>Money market dealer banks</b> – portfolios broken down into: – domestic banks – insurance companies – pension funds – mutual and investment funds – other financial institutions – non-financial legal entities – households – public sector – other non-financial entities – foreign entities	<b>Market size</b> – Central Register of Treasury Bills  <b>Turnover</b> – Central Register of Treasury Bills
NBP money market bills	Nominal value of instruments outstanding on a reporting day	Gross turnover, i.e. the nominal value of instruments bought and sold by all the market participants in a given period, excluding the turnover associated with repo and sell-buy-back operations	Only domestic banks	<b>Market size</b> – Register of NBP Money Market Bills  <b>Turnover</b> – Register of NBP Money Market Bills
Commercial papers	Nominal value of instruments outstanding on a reporting day	Not available	Portfolios broken down into: – domestic banks – insurance companies – pension funds – mutual and investment funds – other financial institutions – non-financial legal entities – households – public sector – other non-financial entities – foreign entities	<b>Market size</b> – Money market dealer banks
Short term bank debt instruments	Nominal value of instruments outstanding on a reporting day	Not available	Portfolios broken down into: – banks – investment funds – insurance companies – corporates – households – other financial institutions – other domestic entities	<b>Market size</b> – Money market dealer banks
Repo/sell-buy-back/buy-sell-back	Nominal value of instruments serving as collateral for the operations outstanding on a reporting day	Gross turnover, i.e. the nominal value of instruments bought and sold by all the transaction participants in a given period	<b>Central Register of Treasury Bills</b> – portfolios and turnover, broken down into: – domestic banks – domestic non-bank entities – foreign entities	<b>Market size</b> – Central Register of Treasury Bills and Register of NBP Money Market Bills  <b>Turnover volume</b> – Central Register of Treasury Bills and Register of NBP Money Market Bills
Interbank deposits	The balance sheet value of deposits placed by reporting domestic banks in other reporting banks and of deposits made and taken by reporting domestic banks from non-reporting banks outstanding on a given reporting day	Gross turnover, i.e. the aggregate value of deposits made and taken in a given period by reporting banks	Only domestic banks	<b>Market size</b> – 14 banks, which provide monthly reports to the NBP <b>Turnover volume</b> – Payment Systems Department of the NBP
Foreign exchange swaps	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a given reporting day	Gross turnover, i.e. the aggregate value of contracts sold and bought in spot and forward transactions under swap arrangement by domestic banks with other domestic banks or with foreign banks in a given period	<b>Monthly information from banks</b> – participants broken down into: – residents – non-residents <b>Money market dealer banks</b> – turnover broken down into: – banks – residents – banks – non-residents	<b>Market size</b> – Monthly information from banks  <b>Turnover size</b> – Money market dealer banks
Treasury bonds	Nominal value of instruments outstanding on a reporting day	Gross turnover, i.e. the nominal value of instruments bought and sold by all the market participants in a given period	<b>Money market dealer banks</b> – portfolios broken down into: – domestic banks – domestic non-bank sector – non-residents	<b>Market size</b> – Ministry of Finance  <b>Turnover volume</b> – National Depository of Securities (monthly bulletin)
NBP bonds	Nominal value of instruments outstanding on a given day	Non-marketable	Only domestic banks	<b>Market size</b> – National Bank of Poland

## Appendix 1 (cont.)

Market	Market size definition	Turnover size definition	Participant structure	Source of information
Local government and corporate bonds	Nominal value of instruments outstanding on a reporting day	Not available	<b>Money market dealer banks</b> – portfolios broken down into: – domestic banks – insurance companies – pension funds – mutual and investment funds – other financial institutions – non-financial legal entities – households – public sector – other non-financial entities – foreign entities	<b>Market size</b> – Money market dealer banks, Fitch Polska S.A.
Mortgage bonds	Nominal value of instruments outstanding on a reporting day	Not available	Not available	<b>Market size</b> – Money market dealer banks
Equities	Total value of all securities listed on the stock exchange, according to market price on a reporting day	Gross turnover, i.e. market value of instruments bought and sold by market participants in a given period	– domestic individual – domestic institutional – foreign	<b>Market size and turnover</b> – Warsaw Stock Exchange and CeTO (monthly bulletin)
Foreign exchange spot market	Definition of the size of the market is similar to the definition of the market turnover	The value of foreign exchange bought and sold by reporting banks in a given period	<b>Money market dealer banks</b> – turnover broken down into: – banks – residents – banks – non-residents	<b>Turnover size</b> – Money market dealer banks
FRA	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	<b>Monthly information from banks – counterparts</b> broken down into: – residents – non-residents	<b>Market size</b> – Monthly information from banks  <b>Turnover size</b> – Money market dealer banks
Futures on interest rate	The total number of outstanding open short and long contracts	Volume of turnover calculated as the sum of contracts sold and bought	Financial and non-financial entities, households	Warsaw Commodities Exchange
Forward fx transactions	The balance sheet value of instruments sold to and bought from residents and non-residents by domestic banks outstanding on a reporting day	Gross turnover, i.e. the sum of contracts sold and bought by domestic banks in transactions with other domestic banks or with foreign banks in a given period	<b>Monthly information from banks – counterparts</b> broken down into: – residents – non-residents <b>Money market dealer banks</b> – turnover broken down into: – banks – residents – banks – non-residents	<b>Market size</b> – Monthly information from banks  <b>Turnover size</b> – Money market dealer banks
Futures on foreign exchange rate	The total number of outstanding open long or short contracts	Volume of turnover calculated as the sum of contracts sold and bought	Financial and non-financial entities, households, foreign investors	Warsaw Commodities Exchange, Warsaw Stock Exchange and CeTO (monthly bulletin)
Futures on stock exchange indices	Value of open positions calculated as the product of the number of open positions and daily settlement price outstanding on a reporting day	Volume of turnover calculated as the sum of contracts sold and bought	– domestic individual – domestic institutional – foreign	Warsaw Stock Exchange and CeTO (monthly bulletin)
Futures on stocks	Value of open positions calculated as the product of the number of open positions and daily settlement price outstanding on a reporting day	Volume of turnover calculated as the sum of contracts sold and bought	Financial and non-financial entities, households, foreign investors	Warsaw Stock Exchange and CeTO (monthly bulletin)
Interest rate swaps	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	– residents – non-residents	<b>Market size</b> – Monthly information from banks
Cross currency interest rate swaps	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	– residents – non-residents	<b>Market size</b> – Monthly information from banks
Interest rate options	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	– residents – non-residents	<b>Market size</b> – Monthly information from banks
Foreign exchange rate options	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	– residents – non-residents	<b>Market size</b> – Monthly information from banks
Securities options	The balance sheet value of instruments sold to residents and sold to and bought from non-residents by domestic banks outstanding on a reporting day	Not available	– residents – non-residents	<b>Market size</b> – Monthly information from banks
WIG20 index participation units	The total number of outstanding open long or short contracts	Volume of turnover calculated as the sum of contracts sold and bought	Financial and non-financial entities, households, foreign investors	Warsaw Stock Exchange and CeTO (monthly bulletin)

## Appendix 2 Gross turnover (in PLN mil)

Month / Year	Treasury bills	NBP bills	Repo (Treasury bills)	Repo (NBP bills)	Sell-buy-back (Treasury bills)	Sell-buy-back (NBP bills)	Interbank deposits
01.1998	41,024.7	1,348.3	1,488.1	578.8	n.a.	n.a.	307,613.2
02.1998	46,611.3	12,314.6	1,160.5	1,404.9	n.a.	n.a.	267,727.0
03.1998	42,788.5	10,433.0	851.7	4,064.2	n.a.	n.a.	322,946.2
04.1998	51,125.4	19,492.8	1,302.1	6,405.5	n.a.	n.a.	293,083.2
05.1998	64,721.0	19,502.1	1,014.1	7,261.4	n.a.	n.a.	300,320.0
06.1998	56,552.4	23,966.0	564.2	8,740.7	n.a.	n.a.	406,828.0
07.1998	60,415.3	30,507.8	376.3	8,735.0	n.a.	n.a.	420,019.4
08.1998	69,187.5	34,992.3	1,269.9	11,714.3	n.a.	n.a.	368,819.6
09.1998	59,695.2	37,678.9	1,292.7	9,605.9	n.a.	n.a.	391,225.8
10.1998	55,911.5	26,863.6	1,115.1	7,079.0	n.a.	n.a.	354,061.0
11.1998	49,005.1	32,583.0	1,111.7	6,885.4	n.a.	n.a.	321,325.4
12.1998	52,717.9	28,381.3	603.5	4,031.0	n.a.	n.a.	409,643.6
01.1999	51,553.2	14,963.7	1,989.9	1,253.1	6,183.7	60.0	432,405.8
02.1999	49,276.8	22,475.0	757.2	3,060.0	7,586.5	234.5	357,840.4
03.1999	68,671.0	23,836.3	539.5	6,100.3	9,693.9	0.0	463,148.4
04.1999	67,553.1	25,290.2	1,999.9	8,074.5	9,461.7	0.0	466,632.8
05.1999	59,553.9	21,408.2	3,185.5	7,020.3	8,621.9	70.8	398,681.6
06.1999	65,278.1	35,314.5	1,982.4	10,883.0	9,443.7	25.3	406,531.2
07.1999	62,936.3	26,828.9	1,925.1	9,173.5	7,927.6	16.5	414,149.6
08.1999	64,015.3	25,520.9	2,034.6	7,714.4	9,764.1	23.2	465,198.6
09.1999	71,768.7	20,363.8	1,638.5	6,855.9	11,583.1	0.0	527,402.8
10.1999	57,434.4	17,448.1	1,071.6	3,531.1	9,000.2	30.0	495,274.6
11.1999	58,796.1	17,919.0	2,406.8	4,479.5	8,704.3	56.3	451,642.2
12.1999	65,028.5	17,721.6	901.8	3,096.0	11,331.8	17.4	477,099.6
01.2000	78,763.4	10,561.8	1,017.9	1,341.2	57,840.8	838.4	514,368.2
02.2000	80,670.4	17,520.1	1,046.3	3,428.9	61,450.2	459.3	565,078.6
03.2000	86,980.7	31,949.4	2,014.4	10,240.7	66,007.6	636.3	642,489.2
04.2000	65,817.7	33,626.3	1,356.2	10,933.7	49,914.5	285.2	534,502.0
05.2000	69,637.1	24,334.7	1,432.6	6,102.5	56,821.2	194.1	626,659.2
06.2000	74,552.7	31,715.4	1,344.6	9,998.2	57,050.2	142.7	684,948.8
07.2000	78,055.1	61,920.7	2,346.5	24,989.8	53,694.6	174.2	484,257.2
08.2000	79,399.2	50,762.4	3,845.9	20,635.4	56,286.3	115.0	467,542.4
09.2000	81,603.2	68,382.0	3,486.2	29,549.9	57,777.6	219.2	455,827.8
10.2000	58,818.5	94,905.9	1,329.7	41,081.3	43,892.0	241.9	588,228.8
11.2000	45,158.0	77,771.4	2,682.8	35,738.5	35,727.6	175.8	497,914.8
12.2000	47,054.9	23,492.0	1,338.3	7,781.4	37,152.1	172.5	482,545.0
01.2001	58,826.3	18,297.7	937.5	5,351.0	45,919.0	126.4	595,038.8
02.2001	47,774.3	41,040.4	653.4	15,418.2	39,017.2	333.5	566,171.8
03.2001	62,414.6	38,872.8	886.8	13,188.9	47,439.6	466.0	664,957.6
04.2001	58,879.4	30,619.1	1,009.7	11,834.8	46,286.9	172.6	640,606.4
05.2001	63,087.9	17,830.4	1,072.4	3,640.9	54,422.9	312.2	648,113.4
06.2001	70,608.2	24,050.9	567.9	6,188.2	55,561.1	378.4	609,394.4
07.2001	84,392.6	27,929.9	658.7	6,742.0	72,339.4	101.4	619,999.2
08.2001	91,628.1	19,461.8	468.1	6,530.9	81,965.9	136.4	719,761.8
09.2001	97,800.8	18,080.5	428.9	1,850.0	84,979.1	267.6	588,657.8
10.2001	121,615.4	20,653.2	301.6	4,701.4	107,636.4	46.0	706,334.8
11.2001	146,787.2	4,327.4	404.4	200.0	128,106.1	24.2	588,219.6
12.2001	128,839.4	11,018.4	640.0	1,860.0	111,440.8	0.0	536,127.6
Total 1998	649,755.9	278,063.7	12,149.9	76,506.1	n.a.	n.a.	4,163,612.4
Total 1999	741,865.5	269,090.0	20,432.8	71,241.6	109,302.5	534.0	5,356,007.6
Total 2000	846,511.0	526,942.0	23,241.4	201,821.5	633,614.7	3,654.6	6,544,362.0
Total 2001	1,032,654.4	272,182.5	8,029.4	77,506.3	875,114.4	2,364.7	7,483,383.2
Change 1999/1998	114.2%	96.8%	168.2%	93.1%	n.a.	n.a.	128.6%
Change 2000/1999	114.1%	195.8%	113.7%	283.3%	579.7%	684.4%	122.2%
Change 2001/2000	122.0%	51.7%	34.5%	38.4%	138.1%	64.7%	114.3%
Monthly average 1998	54,146.3	23,172.0	1,012.5	6,375.5	n.a.	n.a.	346,967.7
Monthly average 1999	61,822.1	22,424.2	1,702.7	5,936.8	9,108.5	44.5	446,334.0
Monthly average 2000	70,542.6	43,911.8	1,936.8	16,818.5	52,801.2	304.6	545,363.5
Monthly average 2001	86,054.5	22,681.9	669.1	6,458.9	72,926.2	197.1	623,615.3

## Appendix 2 (cont.)

Month / Year	Fx swaps	Treasury bonds	Stocks	Futures IR	Forward	Futures fx	WIG 20 index futures	Fx spot
01.1998	15,836.0	4,330.0	3,018.7	n.a.	2,028.2	n.a.	1.3	90,068.2
02.1998	25,046.6	8,285.0	6,459.1	n.a.	3,565.6	n.a.	6.7	111,560.1
03.1998	17,150.4	8,731.0	5,799.5	n.a.	5,617.7	n.a.	9.1	128,386.9
04.1998	12,593.8	9,027.0	4,016.3	n.a.	3,914.3	n.a.	14.2	118,324.8
05.1998	16,034.5	17,458.0	4,568.2	n.a.	4,104.9	n.a.	15.8	140,320.5
06.1998	21,856.1	13,172.0	4,125.4	n.a.	6,544.0	n.a.	34.5	164,285.1
07.1998	19,046.0	25,508.0	6,054.1	n.a.	8,778.6	n.a.	42.4	124,622.4
08.1998	16,233.6	26,063.0	3,947.0	n.a.	12,334.0	n.a.	67.4	169,273.0
09.1998	20,721.6	19,782.0	3,869.6	n.a.	4,898.4	23.0	80.5	118,287.3
10.1998	23,543.9	18,330.0	3,409.4	n.a.	4,879.6	2.0	104.8	108,831.5
11.1998	23,076.1	25,314.0	4,113.1	n.a.	3,851.8	8.0	119.5	109,885.4
12.1998	22,053.1	16,920.0	3,878.5	n.a.	8,339.0	35.0	100.2	106,891.1
01.1999	46,493.7	25,844.0	6,933.9	10.5	10,737.7	683.0	282.7	157,279.1
02.1999	70,121.1	18,478.0	5,821.0	15.0	8,693.6	1,355.0	140.9	157,800.0
03.1999	57,822.9	17,212.0	6,465.0	26.0	15,032.5	1,854.0	218.8	189,009.2
04.1999	67,132.1	15,842.0	6,134.5	26.5	13,510.6	2,405.0	342.6	160,113.8
05.1999	66,091.8	14,326.0	4,872.1	10.0	13,429.9	2,870.0	305.0	143,891.6
06.1999	72,333.7	13,283.0	6,427.0	22.5	15,590.3	3,043.0	360.6	190,901.1
07.1999	92,983.6	11,240.0	7,255.0	16.0	15,254.2	3,086.0	273.4	173,092.3
08.1999	95,156.7	13,285.0	4,273.8	17.0	14,793.2	2,703.0	288.8	184,880.9
09.1999	84,286.2	9,731.0	4,678.0	19.0	13,934.1	5,155.0	539.8	202,718.6
10.1999	85,647.4	12,436.0	3,854.1	0.0	15,454.5	4,893.0	920.5	148,199.9
11.1999	94,247.6	14,421.0	5,792.2	0.0	30,590.6	5,109.0	931.0	166,421.2
12.1999	104,209.6	12,044.0	8,323.5	4.0	27,992.8	4,807.0	1,410.5	139,464.9
01.2000	121,281.8	16,386.0	12,139.9	0.0	33,811.0	5,363.0	4,510.2	161,848.2
02.2000	141,112.2	18,746.0	16,412.6	0.0	34,640.1	4,008.0	7,000.3	198,223.4
03.2000	162,974.5	31,891.0	15,170.7	0.0	47,498.9	6,803.0	5,059.1	239,652.4
04.2000	133,151.0	28,008.0	7,082.7	110.0	39,102.6	4,535.0	3,696.8	216,083.0
05.2000	168,590.2	26,283.0	7,358.6	157.0	53,002.7	3,370.0	4,383.3	242,434.0
06.2000	201,189.9	24,015.0	7,392.2	0.0	34,535.4	1,464.0	3,938.6	234,743.6
07.2000	181,814.1	26,665.0	6,785.1	0.0	20,592.5	956.0	2,800.0	251,138.2
08.2000	224,976.0	22,197.0	5,048.8	0.0	44,881.8	1,471.0	3,370.6	237,619.7
09.2000	331,983.2	34,833.9	5,097.4	0.0	28,475.8	2,424.0	3,839.6	207,724.5
10.2000	337,289.4	32,598.9	4,529.5	0.0	36,292.6	3,092.0	5,492.7	235,319.1
11.2000	273,477.9	28,976.7	7,791.9	0.0	34,274.5	2,835.0	7,430.6	227,080.9
12.2000	223,600.1	39,303.3	8,848.2	0.0	37,128.5	2,328.0	5,979.4	189,846.9
01.2001	366,431.6	62,237.9	7,771.3	0.0	49,826.7	2,068.0	6,947.0	259,266.6
02.2001	372,126.0	61,632.8	6,139.7	0.0	31,882.5	739.0	7,089.7	264,298.9
03.2001	422,549.8	53,095.6	5,803.1	0.0	41,318.3	949.0	9,433.1	281,611.7
04.2001	459,159.9	48,891.5	5,120.7	0.0	38,375.0	818.0	7,696.4	284,690.2
05.2001	467,733.9	52,532.1	4,936.1	0.0	29,225.4	771.0	8,302.8	222,075.5
06.2001	574,476.8	55,269.9	4,201.8	0.0	45,007.3	1,592.0	8,369.2	152,304.6
07.2001	490,634.6	66,919.2	4,475.9	0.0	35,890.0	2,763.0	8,994.6	209,221.6
08.2001	624,869.9	71,841.4	3,277.3	0.0	50,116.0	2,627.0	6,793.1	218,065.1
09.2001	429,370.1	73,560.0	3,349.9	0.0	55,047.9	1,469.0	7,158.2	238,428.8
10.2001	720,245.8	115,075.1	6,482.6	0.0	64,676.5	1,049.0	11,170.3	254,701.7
11.2001	512,671.8	117,385.4	5,029.7	0.0	47,659.3	710.0	9,040.0	178,695.5
12.2001	360,041.8	68,056.6	3,959.8	0.0	50,569.7	972.0	4,937.8	161,695.6
Total 1998	233,191.7	192,920.0	53,258.9	n.a.	68,856.1	n.a.	596.5	1,490,736.3
Total 1999	936,526.4	178,142.0	70,830.1	166.5	195,014.0	37,963.0	6,014.6	2,013,772.6
Total 2000	2,501,440.3	329,903.8	103,657.5	267.0	444,236.4	38,649.0	57,501.0	2,641,713.9
Total 2001	5,800,312.0	846,497.3	60,548.0	0.0	539,594.6	16,527.0	95,932.1	2,725,055.8
Change 1999/1998	401.6%	92.3%	133.0%	n.a.	283.2%	n.a.	1,008.3%	135.1%
Change 2000/1999	267.1%	185.2%	146.3%	160.4%	227.8%	101.8%	956.0%	131.2%
Change 2001/2000	231.9%	256.6%	58.4%	0.0%	121.5%	42.8%	166.8%	103.2%
Monthly average 1998	19,432.6	16,076.7	4,438.2	n.a.	5,738.0	17.0	49.7	124,228.0
Monthly average 1999	78,043.9	14,845.2	7,083.0	13.9	16,251.2	3,163.6	501.2	167,814.4
Monthly average 2000	208,453.4	27,492.0	8,638.1	22.3	37,019.7	3,220.8	4,791.7	220,142.8
Monthly average 2001	483,359.3	70,541.4	5,045.7	0.0	44,966.2	1,377.3	7,994.3	227,088.0

\* Calculation based on data for 4 months (from September to December).

## Appendix 3 Market size – issues outstanding (in PLN mil)

Month / Year	Treasury bills	NBP bills	CP	CD	Repo (Treasury bills)	Inter-bank deposits	Fx swaps	Treasury bonds	Stocks	Corporate bonds
01.1998	33,088.1	9,032.2	2,014.9	552.9	n.a.	11,061.2	n.a.	25,938.7	44,375.41	n.a.
02.1998	34,060.9	18,930.0	1,864.0	555.0	n.a.	11,214.5	n.a.	26,549.7	55,144.15	n.a.
03.1998	33,639.5	20,727.7	2,131.8	467.7	n.a.	11,039.5	n.a.	27,424.7	53,892.06	n.a.
04.1998	33,948.0	23,385.1	2,762.8	602.7	n.a.	11,390.1	n.a.	28,305.3	56,377.18	n.a.
05.1998	33,744.2	20,922.0	2,596.4	451.5	n.a.	14,113.5	n.a.	29,173.9	50,562.75	n.a.
06.1998	35,925.1	22,056.9	3,024.9	346.6	n.a.	15,744.4	n.a.	30,708.3	58,974.40	n.a.
07.1998	34,889.7	25,224.1	3,464.6	408.0	n.a.	13,472.8	n.a.	32,001.4	62,143.58	n.a.
08.1998	33,796.8	28,969.8	3,644.2	1,063.7	n.a.	16,454.6	n.a.	32,449.1	45,023.20	n.a.
09.1998	32,688.0	30,025.2	3,376.3	345.4	n.a.	15,610.4	n.a.	34,460.5	45,344.25	n.a.
10.1998	31,922.7	23,335.0	4,667.3	333.7	n.a.	17,791.4	n.a.	36,526.7	45,166.00	n.a.
11.1998	30,838.5	28,214.7	4,942.7	314.5	n.a.	16,742.3	n.a.	36,330.2	66,669.42	n.a.
12.1998	28,913.9	28,575.5	5,418.8	174.6	n.a.	16,786.8	n.a.	37,562.8	72,443.07	n.a.
01.1999	29,582.5	23,274.4	6,653.5	116.3	n.a.	19,605.0	n.a.	46,883.7	90,766.10	1,131.8
02.1999	29,512.8	31,001.8	6,500.8	160.3	n.a.	20,139.7	n.a.	48,007.6	80,104.68	1,158.9
03.1999	31,445.7	27,429.6	6,614.6	124.1	n.a.	18,138.6	n.a.	50,044.0	84,133.07	1,214.0
04.1999	31,529.5	20,045.7	6,437.6	70.1	n.a.	19,984.0	n.a.	51,679.2	95,285.10	1,251.3
05.1999	30,753.9	19,338.9	6,348.9	57.2	n.a.	20,008.3	n.a.	53,299.3	96,693.55	1,258.9
06.1999	29,749.1	22,583.5	6,400.1	94.5	n.a.	19,824.1	n.a.	53,293.2	105,564.93	1,310.6
07.1999	28,700.4	21,487.5	6,278.4	92.7	n.a.	18,623.6	n.a.	53,897.6	106,068.97	1,385.0
08.1999	28,133.3	21,737.5	6,270.4	97.4	n.a.	22,373.6	n.a.	53,537.1	106,368.52	1,385.5
09.1999	25,575.5	17,839.4	6,522.8	131.6	n.a.	25,829.4	n.a.	65,993.7	87,240.68	1,402.4
10.1999	25,143.9	18,454.4	6,549.5	151.4	271.0	23,195.9	n.a.	65,475.3	92,258.01	1,435.4
11.1999	26,006.7	16,141.2	6,917.5	106.7	68.2	22,176.8	n.a.	65,901.5	106,879.41	1,449.4
12.1999	26,980.2	11,133.0	6,914.4	430.5	165.5	19,496.1	43,185.0	70,577.0	123,410.75	1,448.4
01.2000	27,337.0	15,495.8	7,473.7	333.3	134.3	24,720.9	n.a.	73,479.6	131,577.49	1,783.4
02.2000	27,362.2	24,039.5	7,773.3	437.2	124.1	25,934.5	n.a.	74,641.0	152,388.20	1,710.9
03.2000	27,282.4	19,217.3	8,496.5	474.1	168.8	26,607.8	56,453.0	78,614.1	152,027.76	1,790.4
04.2000	27,058.9	16,002.4	8,582.3	318.6	105.8	25,243.2	n.a.	82,227.7	138,896.95	1,815.4
05.2000	26,065.5	18,939.7	8,696.7	390.7	183.3	25,950.2	n.a.	85,657.5	139,255.62	1,844.1
06.2000	25,625.8	19,927.9	9,512.2	412.4	196.8	27,579.7	88,997.0	86,289.3	138,279.99	2,027.3
07.2000	25,988.6	16,708.0	10,145.5	465.7	272.6	29,630.9	n.a.	86,677.6	138,146.96	1,990.7
08.2000	28,217.6	17,746.3	9,911.7	504.4	284.5	29,069.7	n.a.	87,490.8	130,203.32	1,983.9
09.2000	30,807.7	14,633.3	10,291.6	392.2	346.8	30,026.3	126,568.0	90,884.5	119,131.12	1,928.9
10.2000	25,757.6	16,976.7	10,700.1	495.5	418.8	33,101.7	n.a.	90,824.9	111,077.80	2,153.5
11.2000	24,776.7	20,479.7	10,699.0	554.4	359.1	31,954.7	n.a.	92,364.8	116,812.02	2,149.3
12.2000	23,442.3	20,475.2	10,931.0	641.7	159.6	30,692.6	118,315.0	94,062.8	130,085.00	2,366.3
01.2001	23,059.4	19,500.0	10,796.6	932.2	125.1	23,140.7	n.a.	97,252.1	126,913.51	2,326.9
02.2001	24,768.7	31,776.7	10,985.7	900.3	152.7	23,443.7	n.a.	98,077.6	113,173.54	2,348.6
03.2001	26,510.0	23,251.7	11,524.5	907.3	292.2	22,671.3	167,960.0	101,305.8	109,687.11	2,588.8
04.2001	27,709.8	20,076.4	11,296.9	749.1	146.4	23,712.8	n.a.	103,940.2	112,792.22	2,532.4
05.2001	29,076.0	23,514.4	11,263.8	766.8	179.4	23,049.8	n.a.	105,868.4	113,114.09	2,754.1
06.2001	29,613.8	27,850.8	11,314.7	748.5	57.9	24,299.7	190,063.0	104,568.7	103,203.01	3,004.1
07.2001	29,028.8	25,054.4	11,422.3	794.5	76.0	20,340.5	n.a.	107,210.2	95,884.97	3,039.6
08.2001	29,092.9	20,941.5	12,430.6	1,057.6	215.6	21,473.6	n.a.	109,220.7	91,556.87	3,041.2
09.2001	30,233.3	25,470.1	11,952.6	1,055.1	44.5	21,567.5	206,570.0	112,027.1	87,071.73	3,140.8
10.2001	32,919.1	22,342.0	12,189.6	1,247.5	94.1	21,708.6	n.a.	112,786.4	100,519.77	3,096.5
11.2001	33,759.0	13,500.0	12,111.1	1,488.9	41.9	19,751.5	n.a.	125,786.9	103,495.70	3,094.8
12.2001	35,215.6	14,270.9	12,834.8	1,277.3	41.9	22,134.1	205,733.0	123,685.9	103,384.79	2,519.8
Monthly average 1998	33,121.3	23,283.2	3,325.7	468.0	n.a.	14,285.1	n.a.	31,452.6	54,676.29	n.a.
Monthly average 1999	28,592.8	20,872.2	6,534.0	136.1	168.2*	20,782.9	n.a.	56,549.1	117,477.38	1,319.3
Monthly average 2000	26,643.5	18,386.8	9,434.5	451.7	229.5	28,376.0	97,583.2**	85,267.9	133,156.85	1,962.0
Monthly average 2001	29,248.9	22,295.7	11,676.9	993.8	122.3	22,274.5	192,581.5**	108,477.5	105,066.44	2,790.6

\* Calculations based on data for 3 months (from October to December).

\*\* Calculations based on data for the final months of a quarter.

## Appendix 3 (cont.)

Month / Year	Local government bonds	FRA	Futures IR	Forward	Futures fx	WIG 20 index futures	Swaps IR	Options IR	Options fx	Securities options
01.1998	n.a.	n.a.	n.a.	n.a.	n.a.	0.3	n.a.	n.a.	n.a.	n.a.
02.1998	n.a.	n.a.	n.a.	n.a.	n.a.	0.7	n.a.	n.a.	n.a.	n.a.
03.1998	n.a.	n.a.	n.a.	n.a.	n.a.	1.2	n.a.	n.a.	n.a.	n.a.
04.1998	n.a.	n.a.	n.a.	n.a.	n.a.	1.6	n.a.	n.a.	n.a.	n.a.
05.1998	n.a.	n.a.	n.a.	n.a.	n.a.	2.8	n.a.	n.a.	n.a.	n.a.
06.1998	n.a.	n.a.	n.a.	n.a.	n.a.	4.2	n.a.	n.a.	n.a.	n.a.
07.1998	n.a.	n.a.	n.a.	n.a.	n.a.	5.4	n.a.	n.a.	n.a.	n.a.
08.1998	n.a.	n.a.	n.a.	n.a.	n.a.	4.0	n.a.	n.a.	n.a.	n.a.
09.1998	n.a.	n.a.	n.a.	n.a.	12.0	5.1	n.a.	n.a.	n.a.	n.a.
10.1998	n.a.	n.a.	n.a.	n.a.	11.0	12.0	n.a.	n.a.	n.a.	n.a.
11.1998	n.a.	n.a.	n.a.	n.a.	16.0	12.1	n.a.	n.a.	n.a.	n.a.
12.1998	n.a.	n.a.	n.a.	n.a.	24.0	8.4	n.a.	n.a.	n.a.	n.a.
01.1999	528.0	n.a.	0.0	n.a.	126.0	13.6	n.a.	n.a.	n.a.	n.a.
02.1999	515.1	n.a.	0.0	n.a.	204.0	21.0	n.a.	n.a.	n.a.	n.a.
03.1999	514.8	n.a.	0.0	n.a.	391.0	31.9	n.a.	n.a.	n.a.	n.a.
04.1999	525.3	n.a.	0.0	n.a.	253.0	46.7	n.a.	n.a.	n.a.	n.a.
05.1999	533.2	n.a.	20.0	n.a.	560.0	56.3	n.a.	n.a.	n.a.	n.a.
06.1999	533.9	5,970.9	60.0	7,938.1	581.0	43.5	2,212.7	0.0	1,526.4	8.5
07.1999	554.8	8,166.5	86.0	10,531.1	811.0	50.1	3,692.3	135.0	863.4	10.6
08.1999	555.4	11,486.7	77.0	10,939.8	904.0	54.6	4,850.3	171.0	858.3	12.2
09.1999	582.0	18,583.8	19.0	11,514.0	1,626.0	43.1	6,533.0	637.0	854.0	4.2
10.1999	642.7	23,783.6	19.0	11,417.0	1,555.0	63.9	7,908.3	854.0	1,063.8	7.5
11.1999	650.1	26,596.4	19.0	14,126.8	1,799.0	75.4	10,146.9	1,154.0	1,014.6	15.7
12.1999	653.6	20,556.5	11.0	10,785.1	1,973.0	89.6	13,694.8	1,411.0	81.8	17.7
01.2000	655.1	26,950.5	0.0	11,518.1	1,943.0	131.0	14,880.7	891.0	156.6	23.2
02.2000	660.6	38,610.5	0.0	16,377.0	1,792.0	146.4	18,267.7	4,015.5	1,397.2	26.6
03.2000	618.1	37,887.6	0.0	13,931.0	990.0	135.4	21,540.8	1,336.0	2,233.1	26.8
04.2000	618.3	43,930.8	0.0	15,554.6	794.0	141.6	24,090.0	721.0	3,042.3	34.7
05.2000	624.1	44,988.3	0.0	15,377.5	872.0	134.3	30,447.8	190.0	2,861.9	53.9
06.2000	629.1	53,438.4	0.0	13,570.4	438.0	115.3	32,528.4	1,006.0	4,131.5	65.0
07.2000	574.2	61,106.1	0.0	13,405.9	427.0	128.8	36,343.6	732.0	4,593.4	387.3
08.2000	612.8	62,937.2	0.0	34,838.8	779.0	163.7	39,919.7	1,121.8	7,027.3	67.2
09.2000	651.8	65,686.7	0.0	16,005.6	727.0	182.1	43,121.4	814.0	8,325.9	76.1
10.2000	769.7	63,063.8	0.0	31,722.3	818.0	181.5	45,300.0	864.7	11,872.6	287.2
11.2000	772.0	75,183.3	0.0	16,922.3	966.0	222.1	48,805.1	1,030.8	12,777.6	285.1
12.2000	859.6	67,917.7	0.0	16,002.1	751.0	244.9	49,254.9	1,050.1	10,585.4	336.7
01.2001	884.6	98,495.4	0.0	25,304.3	441.0	253.1	57,559.8	828.3	9,366.8	343.5
02.2001	887.6	84,896.0	0.0	24,102.4	450.0	204.0	61,699.7	979.8	8,738.0	386.0
03.2001	895.5	75,244.0	0.0	30,770.7	390.0	173.0	65,779.7	1,356.7	8,187.7	383.4
04.2001	897.5	78,195.0	0.0	32,087.9	526.0	186.5	65,866.0	1,032.6	7,701.3	390.0
05.2001	918.0	64,269.7	0.0	27,846.1	648.0	189.6	68,290.7	954.7	6,288.6	387.6
06.2001	1,029.7	85,704.1	0.0	20,423.2	1,119.0	147.1	72,784.7	1,025.0	6,322.2	480.3
07.2001	1,108.0	74,528.4	0.0	23,811.4	1,319.0	169.0	75,899.3	566.2	10,926.8	571.1
08.2001	1,129.8	92,353.3	0.0	21,159.0	1,492.0	182.0	86,913.9	736.0	12,003.2	569.0
09.2001	1,209.8	95,479.5	0.0	18,543.1	1,406.0	158.0	92,616.5	1,216.1	10,289.8	573.5
10.2001	1,358.9	103,407.2	0.0	23,489.7	909.0	149.0	97,630.5	1,082.6	7,802.5	674.4
11.2001	1,475.4	133,401.9	0.0	20,456.2	985.0	198.0	103,090.2	1,552.2	6,359.5	673.6
12.2001	1,628.6	118,304.7	0.0	18,500.0	539.0	136.0	99,557.4	993.0	6,191.3	750.1
Monthly average 1998	n.a.	n.a.	n.a.	n.a.	15.8****	4.8	n.a.	n.a.	n.a.	n.a.
Monthly average 1999	565.7	16,449.2***	25.9	11,036.0***	898.6	49.2	7,005.5***	623.1***	894.6***	10.9***
Monthly average 2000	670.5	53,475.1	0.0	17,935.5	941.4	160.6	33,708.3	1,147.7	5,750.4	139.1
Monthly average 2001	1,118.6	92,023.3	0.0	23,874.5	852.0	178.8	78,974.0	1,026.9	8,348.1	515.2

\*\*\* Calculations based on data for 7 months (from June to December).

\*\*\*\* Calculations based on data for 4 months (from September to December).

## Appendix 4 Liquidity indicators (in PLN mil)

Month / Year	Treasury bills	NBP bills	Repo (Treasury bills)	Interbank deposits	Fx swaps	Treasury bonds	Stocks	Futures IR	Forward	Futures fx	WIG20 index futures
01.1998	124.0	14.9	n.a.	2,781.0	n.a.	16.7	6.8	n.a.	n.a.	n.a.	450.9
02.1998	136.8	65.1	n.a.	2,387.3	n.a.	31.2	11.7	n.a.	n.a.	n.a.	990.5
03.1998	127.2	50.3	n.a.	2,925.4	n.a.	31.8	10.8	n.a.	n.a.	n.a.	777.0
04.1998	150.6	83.4	n.a.	2,573.1	n.a.	31.9	7.1	n.a.	n.a.	n.a.	884.3
05.1998	191.8	93.2	n.a.	2,127.9	n.a.	59.8	9.0	n.a.	n.a.	n.a.	555.4
06.1998	157.4	108.7	n.a.	2,584.0	n.a.	42.9	7.0	n.a.	n.a.	n.a.	812.1
07.1998	173.2	120.9	n.a.	3,117.5	n.a.	79.7	9.7	n.a.	n.a.	n.a.	782.0
08.1998	204.7	120.8	n.a.	2,241.4	n.a.	80.3	8.8	n.a.	n.a.	n.a.	1,678.6
09.1998	182.6	125.5	n.a.	2,506.2	n.a.	57.4	8.5	n.a.	n.a.	191.7	1,588.6
10.1998	175.1	115.1	n.a.	1,990.1	n.a.	50.2	7.5	n.a.	n.a.	18.2	873.2
11.1998	158.9	115.5	n.a.	1,919.2	n.a.	69.7	6.2	n.a.	n.a.	50.0	990.7
12.1998	182.3	99.3	n.a.	2,440.3	n.a.	45.0	5.4	n.a.	n.a.	145.8	1,191.4
01.1999	174.3	64.3	n.a.	2,205.6	n.a.	55.1	7.6	x	n.a.	542.1	2,079.9
02.1999	167.0	72.5	n.a.	1,776.8	n.a.	38.5	7.3	x	n.a.	664.2	672.4
03.1999	218.4	86.9	n.a.	2,553.4	n.a.	34.4	7.7	x	n.a.	474.2	685.1
04.1999	214.3	126.2	n.a.	2,335.0	n.a.	30.7	6.4	x	n.a.	950.6	733.2
05.1999	193.6	110.7	n.a.	1,992.6	n.a.	26.9	5.0	50.0	n.a.	512.5	541.7
06.1999	219.4	156.4	n.a.	2,050.7	n.a.	24.9	6.1	37.5	196.4	523.8	828.6
07.1999	219.3	124.9	n.a.	2,223.8	n.a.	20.9	6.8	18.6	144.8	380.5	545.1
08.1999	227.5	117.4	n.a.	2,079.2	n.a.	24.8	4.0	22.1	135.2	299.0	529.0
09.1999	280.6	114.2	n.a.	2,041.9	n.a.	14.7	5.4	100.0	121.0	317.0	1,252.4
10.1999	228.4	94.5	395.4	2,135.2	n.a.	19.0	4.2	0.0	135.4	314.7	1,439.4
11.1999	226.1	111.0	3,531.1	2,036.6	n.a.	21.9	5.4	0.0	216.5	284.0	1,234.9
12.1999	241.0	159.2	544.9	2,447.2	241.3	17.1	6.7	36.4	259.5	243.6	1,573.7
01.2000	288.1	68.2	758.2	2,080.7	n.a.	22.3	9.2	x	293.5	276.0	3,442.1
02.2000	294.8	72.9	843.2	2,178.9	n.a.	25.1	10.8	x	211.5	223.7	4,780.6
03.2000	318.8	166.3	1,193.6	2,414.7	288.7	40.6	10.0	x	341.0	687.2	3,735.8
04.2000	243.2	210.1	1,281.5	2,117.4	n.a.	34.1	5.1	x	251.4	571.2	2,611.1
05.2000	267.2	128.5	781.7	2,414.9	n.a.	30.7	5.3	x	344.7	386.5	3,263.5
06.2000	290.9	159.2	683.3	2,483.5	226.1	27.8	5.3	x	254.5	334.2	3,415.6
07.2000	300.3	370.6	860.8	1,634.3	n.a.	30.8	4.9	x	153.6	223.9	2,174.4
08.2000	281.4	286.0	1,351.7	1,608.3	n.a.	25.4	3.9	x	128.8	188.8	2,058.7
09.2000	264.9	467.3	1,005.4	1,518.1	262.3	38.3	4.3	x	177.9	333.4	2,108.3
10.2000	228.4	559.0	317.5	1,777.0	n.a.	35.9	4.1	x	114.4	378.0	3,026.1
11.2000	182.3	379.7	747.0	1,558.2	n.a.	31.4	6.7	x	202.5	293.5	3,345.8
12.2000	200.7	114.7	838.7	1,572.2	189.0	41.8	6.8	x	232.0	310.0	2,441.6
01.2001	255.1	93.8	749.4	2,571.4	n.a.	64.0	6.1	x	196.9	468.9	2,744.3
02.2001	192.9	129.2	427.9	2,415.0	n.a.	62.8	5.4	x	132.3	164.2	3,475.1
03.2001	235.4	167.2	303.5	2,933.0	251.6	52.4	5.3	x	134.3	243.3	5,454.2
04.2001	212.5	152.5	689.7	2,701.5	n.a.	47.0	4.5	x	119.6	155.5	4,126.3
05.2001	217.0	75.8	597.8	2,811.8	n.a.	49.6	4.4	x	105.0	119.0	4,378.6
06.2001	238.4	86.4	980.8	2,507.8	302.3	53.0	4.1	x	220.4	142.3	5,688.0
07.2001	290.7	111.5	866.7	3,048.1	n.a.	63.0	4.7	x	150.7	209.5	5,322.3
08.2001	314.9	92.9	217.1	3,351.8	n.a.	66.0	3.6	x	236.9	176.1	3,732.5
09.2001	323.5	71.0	963.8	2,729.4	207.9	66.0	3.8	x	296.9	104.5	4,530.5
10.2001	369.4	92.4	320.5	3,253.7	n.a.	101.0	6.4	x	275.3	115.4	7,496.9
11.2001	434.8	32.1	965.2	2,978.1	n.a.	93.3	4.9	x	233.0	72.1	4,565.7
12.2001	365.9	77.2	1,527.4	2,422.2	175.0	55.0	3.8	x	273.3	180.3	3,630.8
Monthly average 1998	163.7	92.7	n.a.	2,466.1	n.a.	49.7	8.2	n.a.	n.a.	101.4****	964.6
Monthly average 1999	217.5	111.5	1490.5*	2,156.5	n.a.	27.4	6.1	33.1*****	172.7***	458.8	1,009.6
Monthly average 2000	263.4	248.5	888.6	1,946.5	241.5**	32.0	11.4	x	225.5	350.5	3,033.6
Monthly average 2001	287.6	98.5	717.5	2,810.3	234.2**	64.4	4.8	x	197.9	179.3	4,595.4

\* Calculations based on data for 3 months (from October to December).

\*\* Calculations based on data for the final months of a quarter.

\*\*\* Calculations based on data for 7 months (from June to December).

\*\*\*\* Calculations based on data for 4 months (from September to December).

\*\*\*\*\* Calculations based on data for 8 months (from May to December).

x Pursuant to mathematical principles it cannot be calculated, it may not be divided by 0.