

PART III
Chapter 17

**Risk Management of Government Debt
in Poland***

by

Arkadiusz Kamiński and Marek Szczerbak

* Arkadiusz Kaminski, Ph.D., Director of Public Debt Department and Marek Szczerbak, Forecast and Strategy Unit, Public Debt Department, both of the Ministry of Finance. The cut-off date for information in this chapter is end of June, 2003.

I. Introduction and background

Developments of public debt management since 1989

Public debt management in Poland has a relatively short history. It begins with the political and economic transition started by the collapse of the communism in 1989. Since then, the structure of public debt and its management, including the institutional and market environment, have changed dramatically. In 1989, State Treasury debt consisted only of vast amount of foreign debt in a form of bank loans. The majority of this debt was not serviced due to solvency problems in the 1980s.

Since 1989, the development of public debt management was guided by a consistent and carefully planned process, moving from passive debt servicing to active debt management, including by managing the various risks involved. This included the restructuring and reduction of foreign debt (in 1991 and 1994 debt owed to official creditors associated in the so-called Paris Club, in 1994 debt owed to commercial banks associated in the so-called London Club), creation and development of the domestic market of treasury securities (first bond issue in 1989, regular T-bills auctions since 1991) and borrowings in the international markets (first bond issue in 1995). Related changes in organisation, legal framework, technical infrastructure, methodology and available instruments followed in parallel.

Volume and structure of the State Treasury debt

In 2002, State Treasury debt amounted to EUR 81.6 bn (42.5 per cent of GDP). Approximately 2/3 of the total debt was domestic, mainly in marketable treasury securities that can be a subject of active risk management. The foreign debt, constituting the remaining 1/3, consisted of four different groups. The main part was the non-marketable debt owed to creditors from the Paris Club. Other three groups were the (non-marketable) loans from international financial institutions, granted for various purposes connected with supporting the transition of Polish economy, the (marketable) so-called Brady bonds issued to restructure the debt to the London Club creditors, and new issues of bonds in international markets.

The structure of State Treasury debt changed significantly since 1990, as a result of a strategy to broaden the scope of choice for debt management instruments so as to be in the position to influence the cost and risks characteristics of the debt portfolio. This resulted in a reduction of the share

of non-marketable debt, a developed domestic debt market and credibility in international markets. The following table illustrates changes in the volume and structure of the State Treasury debt:

	1990	1992	1995	1999	2002
State Treasury debt (% of GDP)	95.1	86.7	54.3	43.0	42.5
State Treasury debt (total = 100)					
Domestic	13.1	26.0	39.6	50.9	66.9
Marketable	0.1	10.8	32.1	36.9	59.7
Non-marketable	13.0	15.2	7.5	14.0	7.2
Foreign	86.9	74.0	60.4	49.1	33.1
Marketable	0.0	0.0	9.5	11.8	8.9
Non-marketable	86.9	74.0	48.7	39.5	24.2

Organisational framework

Management of the State Treasury debt is carried out within the Ministry of Finance. A separate Public Debt Department was established in 1994. At first, it dealt solely with domestic debt. In 1998, domestic and foreign debt activities were merged into a single department. Organisational changes resulted in a move from focusing on instruments to functions. Accordingly, a separate unit for foreign debt, as well as front, middle and back offices were created. These organisational changes reflect the transition from simple borrowing operations to active debt management. In 2002, foreign debt was separated once again and now moved to the Foreign Policy Department.

Sureties and guaranties granted by the State Treasury are managed by a different department of the ministry.

Debt instruments

There has been feedback relation between the stage of development of the financial market in Poland and the set of instruments available for public debt management. The introduction of new instruments depended to an important degree on the increasing stability of Polish economy and growing maturity of the financial market. These reforms resulted in the demand for particular financial instruments. Together with the related supply of these instruments a market was created. The range of instruments has been gradually broadened, which resulted in new opportunities for risk management.

The most important developments in the domestic market of treasury securities were:

- 1989 – first (non-marketable) treasury bonds;
- 1991 – treasury bills;
- 1992 – first issue of 1 year inflation-linked bonds;

- 1992 – first issue of 3 year floating rate bonds;
- 1994 – first issue of 2 year and 5 years fixed rate bonds;
- 1995 – first issue of 10 year floating rate bonds;
- 1999 – first issue of 10 year fixed rate bonds;
- 2001 – introduction of switching auctions of treasury bonds;
- 2002 – first issue of 20 year fixed rate bonds;
- 2002 – introduction of primary dealers system and electronic market of treasury securities.
- Retail instruments have been also introduced as an additional, stable source of financing.

In order to gain access to core international markets, foreign issues have been also made since 1995. The basic rationale is to ensure a cost effective source of refinancing the maturing part of the non-marketable stock of foreign debt. Future membership in the euro zone as well as a proper diversification of exchange rate risk have been taken into account in choosing foreign currency markets. The most important developments in issuing in international markets were:

- 1995 – first USD bond denominated issue;
- 1996 – first DEM bond denominated issue;
- 2001 – first EUR bond denominated issue;
- 2002 – first GBP bond denominated issue;
- 2003 – first JPY bond denominated issue.

Debt management strategy

Since 1999, the public debt management in Poland has been carried on the basis of a formal policy document on public debt management. Under the Public Finance Act (1998), the Minister of Finance submits each year the Public Sector Debt Management Strategy to the Council of Ministers for approval and, next, forwards this document to the Parliament, together with the justification of a draft Budget Act. The strategy covers normally a 3-year horizon but a longer time horizon is possible. It includes:

- the assessment of the past implementation of the previous strategy's objectives;
- macroeconomic and budgetary assumptions;
- risk analysis;
- objectives of the strategy and corresponding tasks for a three-year horizon;
- new instruments of implementing the strategy;

- forecasts of debt volume and debt servicing costs;
- analysis of influencing the debt of the public finance sector;
- threats to the implementation of the strategy;
- conclusions – expected effects of implementing the strategy.

The principal objectives of the debt strategy¹ are:

- a) To maintain the amount of public debt at a prudent level.
- b) To minimise debt servicing costs over the long-term subject to an acceptable level of risk (see below).

Long-term is determined by the longest maturity of those debt instruments that have a significant share in the financing of the borrowing needs; currently this means 10 years.

Risk management

Because of uncertainty regarding the macroeconomic-, budgetary- and market environment, risk management is an integral part of public debt management. The control of risks emerged as a key part of active debt management, a development facilitated by the increase in the number of available debt management instruments. The importance of risk management is also reflected in changes in the organisational structure such as the creation of a middle office in 1999. The objectives and corresponding tasks of debt management were formulated in both cost and risk terms, including the identification and measurement of the key risk components.

The highly non-optimal debt structure of Polish debt in the early 1990s made it quite easy to formulate the desired overall changes in this structure in terms of risk parameters. For example, foreign exchange rate-, refinancing-, and interest rate risks were all considered too high. The strategic (qualitative) objectives were therefore to decrease the share of foreign currency denominated debt, the development of the domestic market so as to improve its efficiency in order to be able to finance borrowing needs on the domestic market, as well as to increase the average maturity and duration of domestic debt. Over time, the question arises what the desired cost and risk balance should be in terms of more precise quantitative criteria. This calls for a formal framework of risk management, which includes translating the qualitative objectives of the strategy into quantitative targets.

Reporting and staff considerations

Currently, the basic risk indicators are used in two ways. Firstly, they are published in monthly State Treasury debt bulletins. Secondly, their expected future values are published as forecasts in the strategy of debt management. Every year, they are analysed in a context of executing the previous strategy's

objectives. There are no strict quantitative targets; risk indicators are used as input into an informal decision process. Such a system was considered satisfactory during the market development stage. More recently, a start has been made with the development of a more formal framework of risk management.

In doing so, in 2002 the debt management unit was split into two: 1) one dealing with current debt management and borrowing operations, and 2) the other with strategic planning and risk management. The strategy and risk management unit has 4 persons² with knowledge of debt management and good theoretical knowledge of risk management (although, thus far, not much practical experience). Their qualifications have been improved through an extensive training programme and study visits to foreign institutions with a more advanced methodology.

II. Overall risk management strategy

The debt management strategy addresses the main risks related to debt management. Analysis of these risks forms a basis for formulating objectives and tasks of debt management. The various risks have been divided into three groups:

Risk related to the volume of debt

This risk is defined as the risk that the volume of debt will exceed a prudent level. Neither theory nor practice determines what the exact prudent debt level is, because it depends on the specific situation of the economy in question. Generally, the more developed the economy, the higher the critical prudent level of debt can be set. A prudent level is understood as a level that would allow the timely servicing and refinancing of debt in a longer-term perspective. An excessive level of public debt can have a negative impact on the state budget itself (high debt servicing costs and crowding out of other expenditures), the economy (crowding out of private investment), and monetary policy (via pressures on interest rates).

Polish law provides for prudential and remedial procedures if the ratio of state public debt to GDP increased by expected payments under sureties and guarantees granted by entities of the public finance sector exceeds thresholds of 50 per cent and 55 per cent, as well as the constitutional limit of 60 per cent based on the Maastricht criterion.³

Clearly, the debt manager has limited means of influencing the level of public debt as this is to a great extent determined by the net borrowing needs.⁴ However, in a broader context, public debt management is an integral part of economic policy of the government. Since the strategy of debt management is approved by the Council of Ministers, it is incorporated into the overall strategy of public finances.

Risks related to the structure of debt and (volatility of) debt servicing costs

These risks constitute constraints to the objective of minimising debt servicing costs over the long term. The main risks are defined as follows:

- Refinancing risk. Due to structural differences between domestic and foreign markets, refinancing risks in local and foreign currencies are being distinguished.
- Foreign exchange risk. The risk of changes in the value of foreign debt volume and debt servicing payments resulting from changes in exchange rates.
- Interest rates risk. The risk of changes in debt servicing costs resulting from changes in interest rates.
- State budget liquidity risk. The risk that state budget cannot settle current liabilities and pay for current expenses.
- Credit risk.
- Operational risk.
- The distribution of debt servicing costs over time.

In contrast to the risks related to the volume of debt, which is managed mainly by higher-level policymakers, risks related to the structure of debt and volatility of debt servicing costs can be addressed directly by debt managers.⁵

Risk related to sureties and guarantees granted by the State Treasury

Surities and guarantees constitute a contingent debt; they increase the risks related to both volume and structure of the debt. Under Polish law, expected payments under sureties and guarantees add to the debt to GDP ratio (which is subject to limitations under the Public Finance Act), while executed sureties and guarantees are debt servicing costs.

III. Assessing policies and trends in managing risks

Risk related to the volume of debt

Macroeconomic and budgetary risks related to control of debt level are important but usually not directly addressed in debt management strategies. However, in Poland this was done for the first time the debt strategy for 2003-2005, by setting a macroeconomic objective of maintaining the public debt volume at a prudent level. This move reflected concerns about the possible negative consequences of a higher debt level for the economy and the state budget.

In the period 1991-1994, the level of State Treasury debt (as the principal component of public debt⁶), moved downward, reached 54.3 per cent of GDP and since then gradually decreased to 38.9 per cent in 2000. The main reasons

were fast economic growth, moderate budget deficits and high proceeds from privatisation (a one-time source of financing for meeting the borrowing needs). This trend was reversed in 2001. The structural deficit of public finances was exacerbated by the economic slowdown, while the significance of privatisation decreased. This resulted in a considerable increase in the debt-to-GDP ratio from 2001 onward. Pressure on government expenditures will continue in the near future due to the co-financing requirements related to entering the European Union in 2004.

The strategy of bringing the debt volume down to prudent levels is dependent on a sustainable path of fast economic growth as well as reform of public finances, especially on the expenditure side.

Risks related to the structure of debt and volatility of debt servicing costs

Domestic currency refinancing risk

The main risk indicators are the average time to maturity (2.80 years for the marketable debt⁷ in mid 2003; Table 17.1 contains details from 1999 onward) and share of debt maturing within a year (34.1 per cent for treasury securities). These levels of risk are still considered too high although the situation has improved considerably by developing the domestic market, in particular the introduction of new instruments with longer maturities, ranging from treasury bills with maturities varying from 4 to 26 weeks in 1991, to 20-year fixed rate bonds in 2002. This has resulted in a significant decrease in refinancing risk. The pace of the decrease in refinancing risk by increasing the average maturity was to some degree determined by cost considerations. However, very high priority was attached to the reduction of refinancing risk, even if higher borrowing costs had to be accepted at the beginning of the development of new market segments.

Table 17.1. **Average time to maturity and duration of PLN denominated marketable debt (in years)**

ATM	Dec. 1999	Dec. 2000	June 2001	Dec. 2001	June 2002	Dec. 2002	June 2003
T-bills	0.36	0.35	0.48	0.52	0.48	0.47	0.47
T-bonds	3.38	3.17	3.17	3.12	3.33	3.36	3.42
T-securities	2.52	2.60	2.58	2.51	2.61	2.73	2.82
DURATION	Dec. 1999	Dec. 2000	June 2001	Dec. 2001	June 2002	Dec. 2002	June 2003
T-bills	0.35	0.34	0.47	0.51	0.48	0.47	0.46
T-bonds	2.04	2.05	2.10	2.14	2.45	2.61	2.77
T-securities	1.55	1.69	1.72	1.76	1.96	2.16	2.32

In the beginning stages, bond issuance was aimed mainly at achieving a smooth distribution of redemptions in terms of months. In 2002, when the capacity for dealing with refinancing risk was sufficiently developed, a new issuing policy was introduced, aimed at the creation of large liquid benchmark issues. The strategic objectives were to reduce borrowing costs (via the liquidity premium) and to prepare the Polish treasury securities market for the integration with European markets (on 1 May 2004, Poland became a member of the European Union). Since late 2001, the refinancing risk of these benchmarks is managed via switching and buy-back operations.

Other reform steps included the introduction in 2002 of a primary dealers system and electronic treasury securities market. These institutional reforms contributed to the improvement of the efficiency, transparency and liquidity of the market, contributing to the reduction of both debt servicing costs as well as refinancing risk. In the debt strategy for 2004-2006, the following targets have been set to reduce the domestic currency refinancing risk:

- increasing the average maturity, determined by the market situation;
- achieving a smooth distribution of maturing and serviced debt over time; and
- decreasing the share of treasury bills in domestic debt.

Foreign exchange risk

The main risk measure is the share of debt denominated in foreign currencies in total State Treasury debt. In mid-2003, foreign debt accounted for 34.0 per cent of the total, while at the beginning of the transition this was 100 per cent. The steady drop in the share of foreign debt was the result of reductions and restructuring of the foreign debt (in 1991 and 1994, about 50 per cent in net present value terms) as well as the adoption of a policy guideline for net foreign financing to be non-positive.

The complete elimination of exchange rate risk is not possible because of the structure of the foreign debt (a large amount of the foreign debt is non-marketable, namely the Paris Club part and loans from international institutions; they accounted in mid-2003 for 57.5 per cent and 11.0 per cent of foreign debt, respectively) but also on the grounds of borrowing cost considerations. The costs of these outstanding non-marketable loans is lower than similar market loans under current market conditions.

The active management of foreign debt includes the use of call options and buy-back operations for Brady bonds. Risk management includes volume considerations and currency structure. The foreign debt used to be denominated in a great variety of currencies. In the past, the foreign debt

portfolio could be characterised as follows: 1) most of it was in non-marketable form (and this could of course not be actively managed); 2) it was relatively cost-effective (due to high spreads between yields in the Polish market and foreign markets as well as costs below market rates); and 3) it was self-hedging (due to diversification of currencies). The following developments have changed this situation: redemptions of the debt; the introduction of the euro; the issuing of new debt in international markets; and convergence of PLN rates to EUR levels. Currently, the bulk of the debt is concentrated in two currencies: EUR and USD, while the low yields of foreign issues do not seem to compensate for risk generated from exchange rate volatility.

In this situation, our debt policy consists of further reducing the share of foreign debt, concentrating the issuance in the EUR market (as a future domestic currency market), as well as properly diversifying exchange rate risk (opportunistic, cost-oriented issues are executed in non-EUR markets). The share of EUR-denominated debt is rising, accounting for 55.5 per cent of the foreign part of the State Treasury debt in mid-2003. Besides exchange rate risk considerations, there are also strategic reasons for using foreign loans for financing certain activities such as for restructuring the economy. Loans are mainly for financing infrastructure projects and provided by international financial institutions (such as the World Bank and European Investment Bank).

In the debt strategy for 2004-2006, the following guidelines were set to reduce the foreign exchange risk:

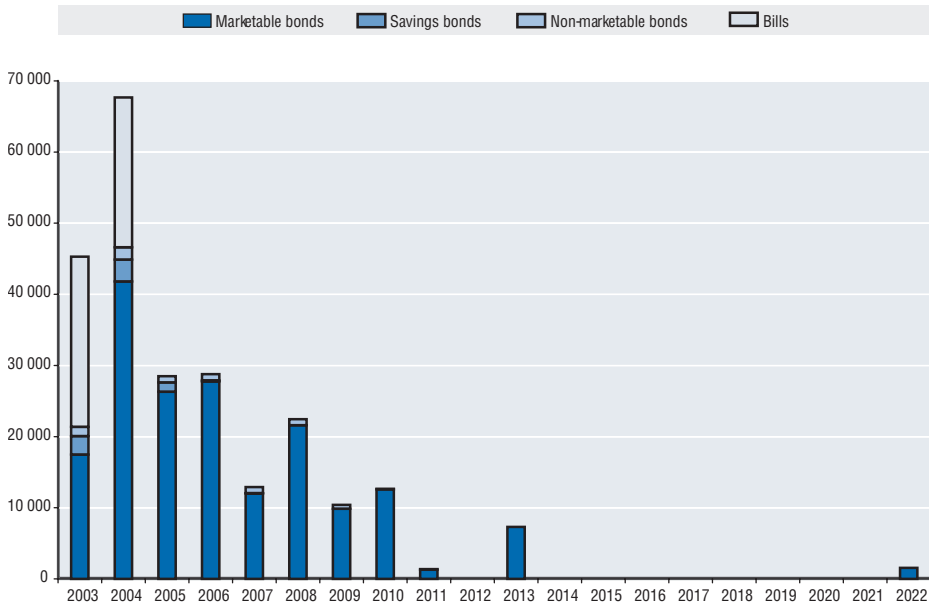
- continuation of the policy rule to borrow abroad mainly to refinance the existing foreign debt;
- using loans from international financial institutions for financing investment and restructuring projects as well as for the pre- and co-financing of European Union projects;
- using other non-marketable sources for financing special purposes projects of particular importance for Poland.

The maturity profile of the State Treasury domestic debt is presented in Figure 17.1.

Foreign currency refinancing risk

The main risk measure is average maturity of foreign debt. It is relatively high (6.0 in mid-2003 for the whole portfolio), although there has been a decreasing trend in recent years. This is mainly the result of the long original maturities of Paris Club loans and Brady bonds, which were designed to help restructuring the Polish economy after the fall of communism. There will be significant changes in the maturity profile in coming years, as the peaks of Paris Club debt that needs to be refinanced will be in the years 2004-2009. As

Figure 17.1. **Maturity profile of State Treasury domestic debt, as of mid 2003**
 PLN million, 1 USD = 3.90 PLN



preparation, starting in 1995, the Polish state is present in crucial⁸ foreign markets. At first, small issues were executed once a year; subsequently, the volume and frequency of issues increased. In the coming years, at least 2-4 issues per year will be executed in international markets.

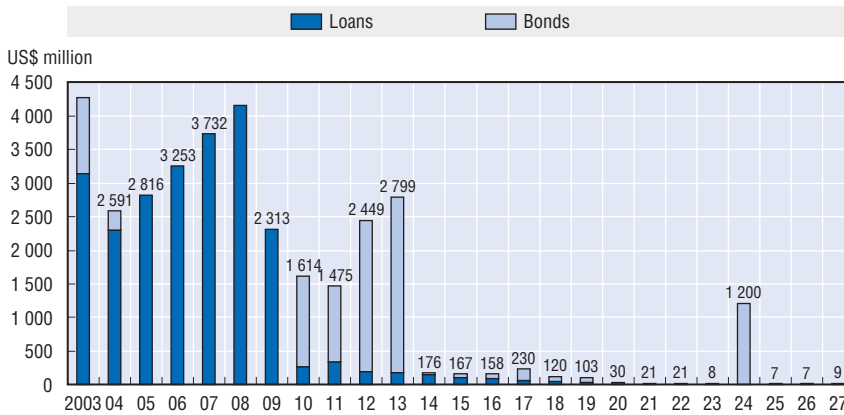
In the debt strategy for years 2004-2006, the following guideline was adopted to manage the foreign currency refinancing risk: the maturity dates of the existing foreign debt will be taken into account, while issuing new foreign debt in other currencies than euro.

The maturity profile of State Treasury foreign debt is presented in Figure 17.2.

Interest rate risk

The main interest risk measure applied for domestic debt is average duration of debt, which is a measure of sensitivity of debt servicing costs to changes in interest rates. In mid-2003, the duration of marketable debt stood at 2.32 years (a rise from 1.55 years at the end of 1999; see details in Table 17.1). The improvement was the result of developing new segments of the yield curve and introducing fixed rate instruments with longer maturities, while moving the bulk of borrowing to the longer end of the maturity spectrum. Currently, the most important instrument is the 5 year fixed rate bond, with

Figure 17.2. **Maturity profile of State Treasury foreign debt, as of mid 2003**
 USD million



2 year zero-coupon bonds the second most important one, while treasury bills still constitute a considerable portion of domestic debt (18.5 per cent in mid-2003).

The interest risk measure applied for foreign debt is the share of debt with interest rates that need to be refixed within a year (that is, the sum of floating rate debt and debt maturing within a year). Such debt accounted for 43.1 per cent of foreign debt (of which 40.2 per cent was a floating rate debt). This generates considerable interest rate risk, but not as significant as exchange rate risk generated by the high volatility of exchange rates (influenced by changes on the Polish currency market and from cross-currency changes).

In the strategy for 2004-2006, the following policy targets were set to reduce the interest rate risk:

- increasing the duration of domestic debt in line with market conditions, in particular the demand for fixed rate bonds with medium- and long-term maturities and further convergence of domestic interest rates to European levels;
- the issuance of mainly fixed rate debt in foreign markets.

Liquidity risk

The main instrument for managing this risk is holding sufficient liquid assets to shield the state budget from temporary market distortions that

would prevent the state from acquiring funds at reasonable cost. There are two main aspects of liquidity management:

- Setting the volume of liquidity at the lowest prudent level (due to alternative costs of keeping liquid assets) through careful planning and monitoring of cash flows via improving the technical infrastructure (which includes government plans for introducing a unified budget account for all public sector entities as well as monitoring the sub-accounts in an on-line mode).
- Managing liquid assets in a most profitable way, which includes government plans for widening the instrument range (deposits in commercial banks and other transactions on the money market).

In 2002, the average amount of liquid assets at the end of a month was 96 per cent of monthly gross borrowing needs. Liquid funds assured financing for 9 to 31 days in particular months (on average 25 days). There was no need to issue short-term treasury bills (with maturities below 13 weeks). Switching auctions were used to reduce both the liquidity and refinancing risks, thereby significantly decreasing volumes of bonds outstanding with closest maturities. In 2002, a system for managing foreign currency liquidity was introduced. This system has a foreign account of state budget and revolving credit facilities, allowing short-term (bridge) financing until the proceeds from a foreign bond issue or privatisation (in foreign currencies) become available.

In the debt strategy for 2004-2006, the following objectives were set for managing liquidity risk:

- maintaining a prudent level of state budget liquidity, while ensuring the efficient management of liquid assets;⁹
- further development of the system of foreign currency liquidity management.

Credit risk

Currently, there are no sources of credit risk related to debt or liquidity management. But the framework of credit risk management will need to be prepared as new instruments are planned to be implemented. This includes deposits in commercial banks (and possibly repo transactions) for state budget liquidity management¹⁰ as well as derivatives for interest rate and foreign exchange risk management, especially interest rate- and currency swaps. The system for credit risk management is likely to include the creation of lists of approved counter-parties for entering into transactions with the State Treasury, as well as setting limits on volume of transactions, depending on the counter-party's rating and risk involved in a particular kind of transaction.

In the strategy for 2004-2006, the following policy guideline was formulated to manage credit risk: only transactions with foreign and domestic entities with a high credibility are allowed.

Operational risk

Operational risk is the least quantitative of all risks considered. Increasing complexity and sophistication of debt management instruments, as well as the international integration of markets, necessitate adjusting the institutional and organisational structure of debt management so as to reduce operational risk. Actions include the creation of a more robust infrastructure of the market but also adjustments in the organisational framework of debt management such as closer co-ordination between the domestic- and foreign debt units. The development of the market creates new challenges to operational risk management that require the use of more sophisticated methods, as well as a more flexible and active approach to debt management using a technical infrastructure compatible with that of market participants. It is also important to avoid possible conflicts between the short-term objectives of the fiscal policy and long-term strategy of debt management.

Operational risk can further be reduced by developing a more sophisticated methodology for supporting key debt management decisions. The Polish Public Debt Department is currently working on the introduction of a benchmark methodology for assessing the volume and structure of debt. Another project is the implementation of an IT system for increasing the safety and integrity of data bases, for strengthening our analytical capabilities, as well as for supporting middle office functions.

In the debt strategy for 2004-2006, the following objective was formulated to reduce operational risk related to the technical infrastructure and organisational structure of debt management.

Other risks

Other risks include the risk of changes in debt volume and structure originating from legal obligation to take over the debt of other entities than State Treasury or meeting the obligations of State Treasury resulting from other reasons than financing the borrowing needs. Clearly, legal and political sources of risk are hard to predict and therefore difficult to manage. However, procedures are in place for converting this type of debt (usually non-marketable) into treasury securities, since such operations were already executed in the past.¹¹ Another risk of a similar nature is related to possible financial operations on assets, liabilities or future proceeds of State Treasury, such as securitisation.

The distribution of debt servicing costs over time

Debt servicing costs should have a smooth distribution over time, in order to avoid distortions in constructing the state budget. In budgets prepared using cash-based budgetary accounting rules,¹² the debt servicing costs of securities issued with deep discounts are concentrated at their future maturities. Issuing them might be tempting to policymakers because they reduce current debt costs (but, of course, their debt servicing costs are higher in the future). Since these securities were issued in the past, they are likely to increase our debt servicing costs in the coming years. In order to smooth their distribution over time, the use of debt management instruments such as buy-backs and switches is required. In the future we plan to use derivatives as well, especially interest rate swaps.

In the debt strategy for 2004-2006, the objective is to better manage and distribute debt servicing costs (as a ratio of GDP¹³) over time. For domestic debt, we aim at a decrease in the cost to GDP ratio, as a result of the decrease in interest rates and growth of GDP, despite the projected increase in debt volume. This should reinforce issuing bonds of medium and long maturities with payments smoothly distributed over time. In contrast, an increase in the cost to GDP ratio is possible for foreign debt, due to the need of refinancing maturing non-marketable debt (which is relatively cheap), at market rates. Issues with substantial discounts will in the future be avoided.

Risk related to sureties and guarantees granted by the State Treasury

The State Treasury granted more sureties and guaranties recently. Accordingly, the risk that potential debt will become actual debt has increased. Expected payments associated with guarantees and sureties as a percentage of GDP rose from 1.3 per cent in 2001 to 1.6 per cent in 2002. The following rules are to be followed in order to reduce or contain the risk related to sureties and guaranties while retaining their advantages:

- Focus on selected sectors crucial for sustained economic development such as infrastructure and protection of the environment (including projects co-financed by the European Union).
- An overall limit of expected payments of 2 per cent of GDP. This includes avoiding that sureties and guaranties will generate substantial risk, especially the ones granted via special (political) “sector” Acts.
- But sureties and guaranties to support traditional sectors of the economy should not be granted either.

IV. Assessment of the current quantitative risk management framework

The simulation model

Efficient management of public debt requires taking into account cost and risk considerations. This in turn calls for a formal modelling framework. Currently, we use a simulation model, which includes the modelling of the impact of various issuance strategies¹⁴ (under different budgetary and market scenarios) on the volume and structure of debt as well as the implications for the debt servicing costs. The model allows for stress testing and sensitivity analyses.

The annual plan of financing the borrowing needs is translated into monthly plans and adjusted monthly to the market and budgetary situation, while assuring the coherence with the state budget act and the overall Debt Strategy. Various cost and risk measures are currently in use to support the debt management decisions. The current framework, although quite comprehensive, has many limitations. The most important ones are:

- Lack of an integrated database (data is either fragmentary or highly aggregated; no straight-through processing takes place, resulting in high operational risk).
- A low degree of automation of data processing. This means that more sophisticated analyses would be very time consuming, thereby limiting the capacity and scope of the analyses currently carried out (for example in terms of the number of different scenarios).
- The framework lacks quantitative targets which makes assessing compliance with debt objectives difficult.
- There are no formal procedures for linking the outcome of analyses with decisions.
- Every non-standard project requires a separate model, usually using simulations.
- The lack of a generally agreed theoretical methodology hampers the development and use of mathematical support models.

Conclusions and plans for the future

Against this backdrop, a more formal approach to public debt management should cover the following elements:

1. Quantitative targets for debt parameters (for translating qualitative strategic objectives into detailed, operational targets).
2. A solid theoretical framework (for determining the desired values of debt parameters).

3. Formal procedures for decisions and evaluating (the formalisation of debt and risk management on the operational level).
4. An efficient infrastructure (an information system with an integrated database that can provide the information needs of debt managers).

The following projects are based on the above diagnosis:

- The implementation of an IT system (the implementation of a front and middle office system customised to specific needs of public debt management was completed in September 2003).
- The introduction of a benchmark portfolio (a pilot version is to begin this year).
- The development of a debt management model (planned).

V. Risk management based on benchmarks

In order to introduce more formal debt and risk management procedures, the Public Debt Department of the Ministry of Finance is working on the introduction of a benchmark portfolio. The benchmark methodology consists of:

- a set of (quantitative) parameters of the State Treasury's debt; a target steady state benchmark (the desired values of debt parameters);
- a path for reaching the benchmark (consistent with the time horizon of the debt strategy);
- limits on the values of the debt parameters (these are quantitative bands reflecting risk preferences); and
- a periodical revision of the benchmark portfolio, to adjust for new information in the environment.

Unresolved questions concern the level of acceptance of a benchmark portfolio and whether it should be announced to the market. The benchmark could consist of the following *parameters*: duration (for domestic debt, EUR denominated debt, other debt); average maturity; share of debt maturing within 1-, 2-, 3 years; share of foreign debt (or possibly currency distribution); share of floating rate debt; share of retail instruments.

Two *benchmark portfolios* would be distinguished: a medium term reference benchmark corresponding with a 3 year horizon of the strategy and a long term steady state target benchmark. Reference benchmarks would be subject to annual adjustments to new information in the environment, while target benchmarks would be adjusted rarely (for example as new research knowledge would become available). An *integrated debt model* is to be developed as a conceptual framework for decision-making. An important question to be addressed is whether to develop a model using in-house resources or external expertise. On the basis of the experiences from other debt offices, the best solution seems to be a compromise between these two options: the

development of an in-house model in close co-operation with external experts; the latter experts need to have excellent knowledge of modelling techniques and financial markets.

Implementation of an *integrated IT system* is a *sine qua non* for the development of a more advanced methodology for supporting debt management decisions. This system should make available reliable data from an integrated database, automatically calculate cost and risk measures, as well as create reports.

The main objective of the new system is to support front- and middle office functions, budgetary planning, and reporting functions. The new system will enable strategic planning functions and scenario analyses of both existing debt and simulated transactions. It is envisaged that the data generated by this system will be used in the new debt management model.

Notes

1. As formulated for the years 2003-2005 and confirmed for the years 2004-2006.
2. The strategy and risk management unit is also involved in other responsibilities.
3. The Polish methodology of calculating public debt is more restrictive than the European Union methodology, resulting in a higher debt to GDP ratio. In 2002, this ratio was 47.2 per cent according to Polish methodology, in comparison with 41.6 per cent according to ESA 95 methodology.
4. For given borrowing needs, the nominal debt volume can to some extent be influenced by the use of debt management instruments such as buy-backs or derivatives. When such instruments are used, there is usually a trade-off between debt volume and debt servicing costs. Also an efficient secondary market can contribute to a reduction in debt servicing costs.
5. The State Treasury debt is directly managed by the Minister of Finance. Other government debt components, such as debt of the remaining central government sector (including health care units and social pensions fund) and of local governments, are subject only to indirect influence with respect to both volume and structure.
6. At the end of 2002, State Treasury debt stood at 93.0 per cent of public sector debt.
7. ATM was higher for overall treasury securities due to long maturities of non-marketable bonds issued on various occasions for special purposes. The importance of non-marketable domestic debt is decreasing, in mid 2003 it accounted for 5.0 per cent of domestic debt.
8. EUR and USD markets are considered crucial, although JPY, GBP and CHF are also of importance.
9. This includes the introduction of a unified account of the state budget, allowing for complete information on liquidity at the end of each day. An on-line system of monitoring and managing the accounts of all budgetary entities will be introduced after that.

10. Currently, liquid assets are invested in a form of short term deposits in the National Bank of Poland only.
11. Such as the restructuring of the debt of health care units.
12. Cash basis accounting rules are currently used in budgetary accounting, as well as in liquidity risk management. Accrual basis accounting rules are used simultaneously as they give a better measure of the distribution of the cost burden over time.
13. In 2002, this ratio stood at 3.1 per cent, of which domestic debt 2.7 per cent of GDP.
14. This also includes buy-backs, switches and swaps.

Table of Contents

Part I

Introductory Overview and Analytical Framework

Chapter 1.	Introduction to advances in risk management of government debt by Hans Blommestein	11
Annexe 1.A	Optimal Debt and Strategic Benchmark: the Risk Management Approach to Debt Sustainability	22
Chapter 2.	Overview of Risk Management Practices in OECD Countries by Hans Blommestein	27
Chapter 3.	Analytical Framework for Debt and Risk Management by Lars Risbjerg and Anders Holmlund	39
Annex 3.A.	Structure of Debt Simulation Model	54

Part II

Recent Developments in Managing Market Risk, Operational Risk and Contingent Liability Risk

Chapter 4.	Recent Developments in the Management of Market risk by Ove Sten Jensen and Lars Risbjerg	61
Chapter 5.	Management of Operational Risk by Sovereign Debt Management Agencies by Peter McCray	67
Annex 5.A.	Sovereign Debt Management Operational Risk Survey: Summary of Responses	72
Annex 5.B.	OECD Working Party on Government Debt Management Survey on Operational Risk 2002.....	80
Chapter 6.	Explicit Contingent Liabilities in Debt Management	89

Part III

Risk Management Practices in Selected OECD Debt Markets

Chapter 7.	Risk Management of Government Debt in Austria by Paul A. Kocher and Gerald Nebenführ	119
Chapter 8.	Risk Management of Government Debt in Belgium by Jean Deboutte and Bruno Debergh.....	129
Chapter 9.	Managing Risks in Canada’s Debt and Foreign Reserves by Pierre Gilbert, Zar Chi Tin and Mark Zelmer	139
Annex 9.A.	Investment and Credit Guidelines for the Exchange Fund Account	154
Chapter 10.	Risk Management of Government Debt in Denmark by Lars Risbjerg	157
Annex 10.A.	The Scenario and CaR Model	171
Annex 10.B.	Principles for Credit Risk Management.....	174
Chapter 11.	Risk Management of Government Debt in Finland by John Rogers	177
Chapter 12.	Risk Management of Government Debt in France by Bertrand de Mazieres and Benoit Coeure	189
Chapter 13.	Risk Management of Government Debt in Portugal by Rita Granger	199
Annex 13.A.	Benchmarking for Public Debt Management.....	210
Chapter 14.	Risk Management of Government Debt in Sweden by Per-Olof Jönsson	217
Chapter 15.	Risk Management of Government Debt in the United Kingdom by Toby Davies	231
Annex 15.A.	DMO Functional Structure.....	244
Chapter 16.	Risk Management of Government Debt in the Czech Republic by Petr Pavelek	245
Annex 16.A.	Government Debt Management Regulations	261
Chapter 17.	Risk Management of Government Debt in Poland by Arkadiusz Kaminski and Marek Szczerbak	263

List of boxes

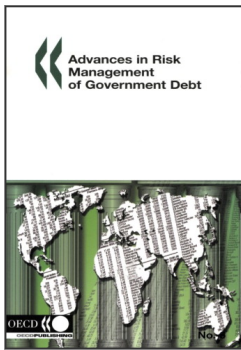
6.1.	Illustration of the risk of a loan guarantee	105
9.1.	Application of the model: finding a new balance	145

List of figures

3.A1.	Structure of government debt simulation model	54
6.1.	Probability distribution of net assets	105
7.1.	Currency value at risk	122
7.2.	Interest expense 2004-2011	123
7.3.	Value at Risk	124
7.4.	Current exposure in previous year	126
9.1.	Funds management governance framework	141
9.2.	Debt strategy framework	143
9.3.	Composition of EFA assets	149
9.4.	EFA assets by credit rating	149
9.5.	EFA funding composition	150
10.1.	Structure of Government Debt Management	161
10.A1.	Structure of simulation model	171
11.1.	Currency risk: composition of foreign currency debt	181
11.2.	Interest rate risk: share of floating rate debt	182
11.3.	Interest rate risk: modified duration	182
11.4.	Refinancing risk: redemptions within one year	184
11.5.	Refinancing risk: redemption profile	185
13.1.	IGCF organisational chart	200
13.2.	Refixing profile of the debt portfolio vs. the benchmark	203
13.A1.	DEM rate history	212
13.A2.	Strategies and scenario generators	213
13.A3.	Cost/Risk measure	214
14.1.	Central government debt, 1990-2003 (including derivatives)	219
16.1.	The Government Debt Management Unit at the MoF – Organisational structure in 2003	250
16.2.	Refinancing vs. redemptions and net issues, 1993-2003 (% of gross domestic product)	253
16.3.	Monthly refinancing vs. redemption profile of T-Bonds during 2002 and 2003 (CZK billion)	255
16.4.	State debt redemption profile vs. interest rate refixing profile (inc. swaps), September 30, 2003	256
17.1.	Maturity profile of State Treasury domestic debt, as of mid 2003	273
17.2.	Maturity profile of State Treasury foreign debt, as of mid 2003	274

List of tables

5.A1. Break-up of Staff involved with middle office functions	75
13.A1. Liability and asset management	211
16.1. Published strategic targets for 2003	248
16.2. Czech state debt portfolio in 2003	254
17.1. Average time to maturity and duration of PLN denominated marketable debt (in years)	270



From:

Advances in Risk Management of Government Debt

Access the complete publication at:

<https://doi.org/10.1787/9789264104433-en>

Please cite this chapter as:

Kaminski, Arkadiusz and Marek Szczerbak (2006), "Risk Management of Government Debt in Poland", in OECD, *Advances in Risk Management of Government Debt*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264104433-18-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.