Government decision

Guidelines for Central Government Debt Management in 2000

Decision taken at the Cabinet meeting 11 November 1999

REGERINGSKANSLIET

Ministry of Finance

Appendix

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1 Summary

The foreign currency debt is to be amortised by an amount equivalent to SEK 25 billion during 2000. The Swedish National Debt Office may deviate plus or minus SEK 15 billion from this amount. The chief reason for the increased flexibility is to avoid major shifts in the proportion of foreign currency borrowing. It is reasonable for the National Debt Office to report publicly its plans for the implementation of its mandate for foreign currency borrowing, as well as possible modifications to these plans.

The outstanding stock of inflation-linked borrowing will not be reduced in 2000. However, a reduction might be permitted for reasons of promoting more efficient markets.

The State's financing needs will otherwise be met by nominal kronor-denominated borrowing.

The average duration of the nominal kronor-denominated debt, inclusive of borrowing on the domestic retail market, and foreign currency debt, will be 2.7 years at the end of 2000. This implies some reduction in the average maturity of the central government debt. The National Debt Office in its management of the debt is allowed to deviate upward or downward from this benchmark by 0.3 years.

A maximum of 30 per cent of the entire debt will be allowed to mature within the next twelve months. However, the National Debt Office will manage the borrowing such that no more than 25 per cent of the debt comes due during this period.

2 Introduction

In spring 1998 the Government presented a proposal for a new decision-making structure and a new formulation of objectives for central government debt policy in the bill, the Management of the Public Debt (Government Bill 1997/98:154). The Sveriges Riksdag endorsed in all essentials the Government's proposal (bet 1997/98:FiU29, rskr 97/98:253) and thus legislated the overall goal for the management of the central government debt. This goal is the management of the central government debt in a way that minimises the long-term cost of the debt and at the same time takes into consideration the risk inherent in its management. Moreover its management must be within the framework imposed by monetary policy requirements.

Under the new decision-making structure, the Government will decide no later than November 15 each year on next year's guidelines for the management of the central government debt by the National Debt Office. The Government will receive proposed guidelines from the National Debt Office and the Sveriges Riksbank will be given the opportunity to comment on the proposal. The National Debt Office submitted a proposal for the guidelines on October 1 and the Riksbank's comments were received October 22.

3 The Basis for the Government's Guidelines [1]

3.1 The Structure of the Debt

The objectives for managing the central government debt are the minimisation of long-term costs together with due consideration for the risk inherent in management. Consequently the expected total costs must be weighed against the increased risk that the cost reduction might possibly entail. Furthermore the debt must be managed within the framework imposed by monetary policy requirements. This restriction means that higher costs for managing the debt can be accepted with a view to the requirements imposed by monetary policy.

The objective for the management of the central government debt means that it is the expected total costs and the overall risk in managing the debt that are of interest. Therefore in deciding on the guidelines for the management of the central government debt, it is important that the structure of the debt as a whole have the characteristics desired. It is especially important to take into account the interaction between the risks, as the total risk does not consist of the sum of the risks in the portfolios' parts.

The distribution among the three types of debt—nominal kronor-denominated borrowing, inflation-linked borrowing and foreign currency borrowing—together with the choice of maturity and a maturity date profile for the types of debt, are the main determinants of the debt's characteristics. Thus in principle it is simple to identify

[1] In Chapter 6, the Technical Appendix, a more detailed explanation of some central concepts is given.

what variables determine costs and risks in the management of the central government debt. However it is not so easy to state ex-ante what values should be assigned to these quantities in order to be able to achieve the objectives of central government debt management. For example, it is difficult to anticipate how the factors that determine costs (interest rates, exchange rates, borrowing requirements and so forth) will develop.

At the end of 1999 the central government debt was estimated to come close to SEK 1,400 billion (including derivative instru-ments), or about 71 per cent of GDP. The total central government debt is projected to decline by about SEK 80 billion or 5.5 per cent in 1999. Measured as a percentage of GDP, it is estimated that the debt will fall by over 7 percentage points. The distribution of the central government debt by type at year end, 1995 to 1998, and a forecast for the end of 1999 are shown in Table 1.

Table 1. Structure of the Debt Including the Value of the Derivative Portfolio 1995-1999, SEK billions

	1995	1996	1997	1998	1999
Nominal debt in kronor	978	919	912	920	890
percentage of debt	*70.1*	*64.7*	*63.4*	*62.5*	*63.9*
Inflation-linked-loans	16	74	91	94	97
percentage of debt	*1.2*	*5.2*	*6.3*	*6.4*	*7.0*
Foreign currency debt	402	426	436	459	405
percentage of debt	*28.8*	*30.0*	*30.3*	*31.2*	*29.1*
Total debt incl. derivatives	1 396	1 419	1 439	1 473	1 392
Total debt excl. derivatives	1 386	1 412	1 430	1 449	1 380

Note: The debt in foreign currency has been revalued at the exchange rates in effect at year end. The revaluation for December 31, 1999 is based on exchange rates forecasts in the Budget Bill for 2000.

Nominal kronor-denominated borrowing traditionally represents the most important source of financing for the National Debt Office. Most of the borrowing is done through treasury bonds (loans with maturities of more than one year) and treasury bills (loans with maturities generally less than one year). In addition borrowing in the Swedish domestic retail market—chiefly lottery bonds and National Debt Savings—is also included in this category. By the end

of 1999 it is estimated that nearly 64 per cent of the debt will consist of nominal kronor-denominated loans. Inflation-linked borrowing complements nominal kronor-denominated borrowing. This form of borrowing offers the investor the opportunity of protection against the risk of inflation. The issuance of inflation-linked bonds began in 1994. It is estimated that they will make up 7 per cent of the debt towards the end of 1999.

From the middle of the 1970s to the middle of the 1980s, foreign currency borrowing made up a growing percentage of the central government debt. In 1985 foreign currency borrowing constituted more than 20 per cent of the debt. The norm for foreign currency borrowing, which was in effect from the mid-1980s to 1992 and which meant that the central government would not finance net borrowing in foreign currency, led to a decline in the proportion of foreign currency debt to just under 10 per cent. The Government's decision on foreign currency borrowing refers to borrowing associated with foreign exchange exposure. Consequently borrowing in foreign currency by the National Debt Office also includes derivative instruments which are comprised of swaps between kronor and foreign currency[2] and of derivative positions that have been included for the purpose of adjusting the currency distribution of the foreign debt and interest rate risk in compliance with the target stipulated by the Government. The size of the central government debt, excluding the value of the derivative trans-actions, is shown in Table 1 above.

[2] The National Debt Office has, in order to reduce costs, chosen to borrow in Swedish kronor and then use currency swaps to convert the loans into foreign currency debts. This strategy has often proven to be cheaper than direct foreign currency borrowing

3.2 Measuring Costs

The Government's Assessment: Given the long-term nature of central government debt and the fact that the borrowing normally includes a large proportion of long-term loans that are held until they fall due, the costs of the government debt should be measured with the average running-yield-to-maturity. In evaluating the operational management against a benchmark portfolio market valuation of the debt should be applied.

The law (1988:1387) on central government borrowing and debt management does not explicitly define how cost and risk in central government borrowing and debt management are to be measured. In the decision on the guidelines for 1999, the Government chose not to take a position on the absolute cost measure to be used in the management of the central government debt. However in the evaluation of the operational management, relative costs—costs in relation to a benchmark portfolio—should be used.

The objective of minimising the costs of central government debt management refers to the absolute costs of the debt rather than the costs relative to a benchmark. Absolute costs could be measured in SEK, for example, or as an interest rate. The absolute costs should therefore be used in order to determine the debt's foreign currency structure, the distribution between nominal and real loans and maturity. Benchmark portfolios intended to direct the day-to-day management of the central government debt should also be designed taking absolute costs into consideration. In evaluating two or more portfolios, the portfolio that is expected to give the lowest absolute costs, expressed either in kronor or as an interest rate, at a given level of risk should be chosen.

In the guidelines for 2000 the National Debt Office is proposing that the absolute costs in the management of the central government debt be measured as the average running-yield-to-maturity, defined as the volume-weighted average of the running-yield-to-maturity that the debt was issued at. The measurement can be interpreted as the average interest cost on the debt at each point in time.

Assigning weights for the volume enables the measure to take into consideration the size of the loans taken at a certain interest rate level and therefore these weights can be converted into kronor by multiplying them by the outstanding debt. The proposal is to replace the previous measure, periodicised interest payments, with this measure. Periodicised interest payments measure cost, that is, interest payments, that has been evenly distributed over time.

The Government shares the view of the National Debt Office that the average running-yield-to-maturity is a suitable measure for the absolute costs of central government debt management. The average running-yield-to-maturity constitutes a more unambiguous measure than periodicised interest payments as it is free of standardised assumptions for cost estimates. It can also be interpreted intuitively: the average interest cost on the debt for each point in time.

As the debt represents a long-term commitment with a large proportion of long-term loans that are held to maturity, the running-yield-to-maturity, that is the undertaking made at the time of issuance, is a good indicator of the actual costs. A market evaluation of the debt, which represents an alternative measure of the absolute costs, assumes that the entire debt, or a large part of it, can be amortised. Only then is a profit or loss realised. Since in principle a large part of the loan is held to maturity, costs measured using a market value would give misleading values for the relevant costs (and subsequently the risks). If a loan is held until it falls due, profits and losses expressed in terms of market values that occur in the course of the loan will offset each other. The cost of a loan held to maturity will be equal to the running-yield-to-maturity. A market evaluation also provides large variations in unrealised costs and thus a misleading picture of risk-taking in the management of the central government debt.

However in evaluating the operational management of the central government debt, the relative costs compared with a benchmark portfolio should be used. In the operational management of the debt, using the average running-yield-to-maturity could give the wrong incentives: the exchange of bonds with a high running-yield-

to-maturity for newly issued paper with lower rates in situations with falling interest rates normally does not reduce the costs, even if the average running-yield-to-maturity is lower. As a position against a benchmark in principle can always be closed, it is possible to realise a profit, for example, when compared with this portfolio. Such a profit or loss is comprised of the realised market value of the position being closed compared with the benchmark's market value. Thus it is also natural to measure the risk in the day-to-day management of the debt in terms of market value.

Accordingly the Government is of the opinion that in evaluating the operational management of the central government debt, a market valuation of the debt will also be applied from now on.

3.3 Measuring Risk

The Government's assessment: The preferred measure of risk should be the average running-yield-to-maturity, which takes into consideration the risk of variation in the absolute costs measured with the average running-yield-to-maturity. When evaluating the management of the central government debt according to a benchmark portfolio, the market value of the debt is to be applied.

There are good reasons why the starting point in examining the principal risk in central government debt management, is the variation in the real costs of the debt. Of course changes in the nominal costs do not always need to be regarded as a risk factor. In principle a correspondingly high nominal revenue can be expected to compensate for a high nominal cost of the debt as a consequence of unexpectedly high inflation.[3] However with a nominal approach to risk, variations in nominal interest costs always represent a risk,

[3] However in the event of supply-side shocks such as higher oil prices or a negative productivity shock, inflation can rise simultaneously with a fall in revenues.

even if they are due to unexpected high inflation at the same time that uncertainty about the future price level is creating nominal risks for real loans.

With a real approach, the risk of long-term real borrowing would be low as the running-yield-to-maturity is fixed for a long period. Accordingly a real respective nominal approach to risks may lead to different conclusions on the structure of the debt: real loans contribute to the nominal risk but limit the real risk.

In the Government Bill on the management of the central government debt and in this year's guidelines, the Government has observed that international knowledge of a real approach to handling risk in portfolio management and experience in using it are limited and therefore cannot form the basis for the Government's guidelines. However the Government intends to conduct a separate investigation of the possibilities of using the concept of real risk in the future management of central government debt. Therefore for the time being the Government is taking a nominal approach to risk.

The National Debt Office in its proposed guidelines discusses three concepts of risk that should be taken into consideration in deciding how the central government debt should be structured.

The primary measure of risk in managing the debt should, according to the National Debt Office, be linked to the measure selected for absolute costs and thus refers to the variability in the average running-yield-to-maturity. This measure could be called the average running-yield-to-maturity risk. The English concept, Running-Yield-at-Risk (RYaR) is customarily used. As the central government debt should be seen as a long-term undertaking, short-term borrowing creates a mismatch between debt and financing, which generates risk that is captured by RYaR. Short-term borrowing leads to a relatively larger borrowing requirement in each given period and greater uncertainty about the future average issuing rate for new loans. A larger gross borrowing requirement, resulting from bigger deficits and/or a higher volume of loans falling due, also gives rise to greater uncertainty about the terms and conditions of future borrowing and thus contributes to increased risk. In addition short-term interest rates are normally more volatile than

long-term rates. It is true that risk measured with RYaR thus rises the shorter the maturity chosen for the central government debt.

The risk that higher interest payments on the central government debt will negatively affect net lending should, according to the National Debt Office, also be taken into consideration when measuring risk. This measure is closely linked to RYaR, as higher RYaR at the same time increases the risk of a deterioration in net lending. In accordance with the practice of using English concepts, this risk can be called Financial-Savings-at-Risk (FSaR). Unexpected reductions in net lending affect both the domestic budget policy objective of a 2 per cent surplus in net lending in relation to GDP over one business cycle and the upper limit in the deficit permitted by the Stability and Growth Pact of 3 per cent of GDP. RYaR constitutes a long-term restriction whereas FSaR can be considered a restriction on an annual basis as the budget policy objectives are annual.

As previously mentioned, the risks measured by RYaR and FSaR decline with the time to maturity, which, all else being equal, implies that a longer average maturity is being chosen.

Finally, the National Debt Office is of the opinion, that a third risk measure should be taken into consideration, namely the risk of fluctuations in the market value of the debt, Value-at-Risk (VaR). If with longer maturities, the central government budget shows surpluses so big that they exceed the value of bonds then falling due, the State must then buy back the bonds that are outstanding. If the market value of the debt then rises (which implies a fall in interest rates), the buy back has to be done with a loss on exchange. The risk measure VaR thus implies, all else being equal, that a shorter maturity should be chosen.

The Government largely shares the conclusions of the National Debt Office. Given that the average running-yield-to-maturity is chosen to measure the absolute costs, it is natural to use the average running-yield-to-maturity risk as the primary measure of risk. With very short maturities on the central government debt, the risk is substantial that the interest costs will be fixed at a high level for a long time. The risks connected to net lending will also increase. This illustrates the matching risk between the debt's long-term character

and short-term financing. The market value risk will be low with short maturities and high with long maturities. However as previously noted, it is not especially relevant if the market value risk is high, considering that in principle a large part of the debt is held to maturity. These conclusions on risk measurement support the analysis when it comes to choosing measures of absolute costs. The financial-savings risk should be seen as a complement to the average running-yield-to-maturity risk.

However as the National Debt Office points out, there is reason to avoid very long average maturities on the debt. If the National Debt Office is forced to buy back bonds in situations of very large budget surpluses, profits or losses on exchange have to be realised. However this aspect of risk generally must be considered to be subordinate. Normally loans falling due also represent an adequate buffer for managing relatively large surpluses.

In the day-to-day management of the debt when a market valuation of the debt constitutes the relevant measure of costs, it is natural, in the opinion of the Government, to measure risk in terms of the market value risk. As observed previously, it is then a matter of positions that can be closed and profits or losses that can be realised. The risk of this happening is measured, for example, by the relative market value of the position taken compared with a benchmark.

3.4 Balancing Cost and Risk

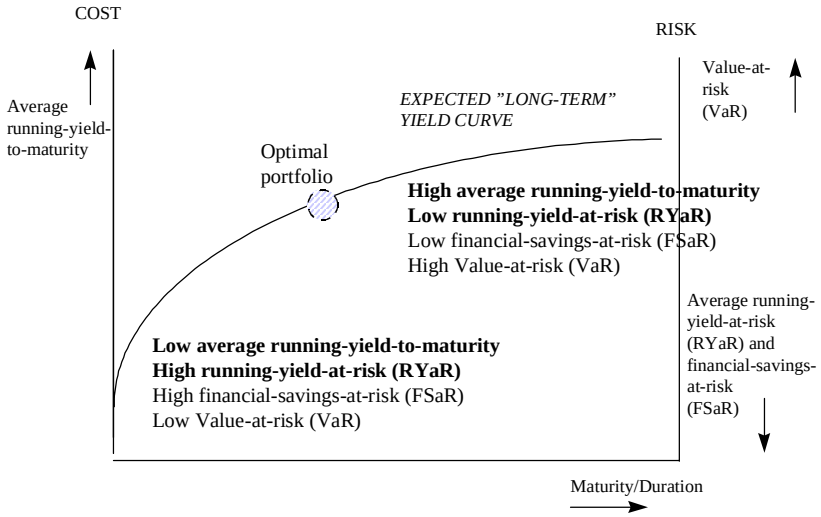
As previously pointed out, the costs of managing the debt will be minimised at the same time that the risk in its management is taken into consideration. It has also been pointed out that the primary measure of risk, RYaR, indicates greater risk the shorter the average maturity of the debt. The conclusion of the National Debt Office, based on international studies and its own modelling, is that nominal yield curves can on average be expected to have a positive slope. This means that a shorter maturity should lead to cheaper long-term borrowing. Accordingly cost minimisation points towards central

government debt with a relatively short maturity, whereas risk considerations taken as a whole argue for a relatively long maturity.

Figure 1 describes the basic connection between cost and risk. A central government debt with a short maturity leads not only to a relatively low expected average running-yield-to-maturity, but also to a mismatch between long-term debt and large refinancing needs. As a result, uncertainty as to the future average running-yield-to-maturity increases, that is RYaR rises. When net lending is affected by interest payments, the risk of a deterioration in net lending also increases, that is FSaR increases.

A long maturity means a better match between the long-term debt and a smaller refinancing requirement, which means less uncertainty about the future average costs of issuance, (that is RYaR and FSaR decline). The price of this reduced uncertainty is a higher average running-yield-to-maturity. In addition a longer maturity increases the value risk (VaR) in the central government debt, that is, the risk that with large budget surpluses, the State is forced to buy back outstanding bonds at a loss (if the market value of the debt rises owing to lower interest rates).

Figure 1. The Connection Between Cost, Maturity and Risk in Central Government Debt Management[4]



This means in principle that the cost minimisation and the three concepts of risk together produce a maturity interval for the central government debt, in which the balance between cost minimisation and an acceptable level of risk may be expected to lie. Therefore it could be said that the optimal maturity for the central government debt is decided by balancing a short maturity with the aim of minimising costs with the consideration that the risk of fluctuations in the average running-yield-to-maturity is not too large (see the "optimal portfolio" point in Figure 1).

[4] The left y-axis indicates rising costs in terms of average running-yield-to-maturity moving upwards in the figure. The right y-axis measures the risks and indicates an increase VaR moving upwards in the figure and an increasing RYaR and FSaR moving downwards in the figure respectively.

3.5 The Basis for the Decision on the Guidelines

The Government's assessment: There is still insufficient basis for establishing guidelines for the desired proportions of different classes of debt. Therefore the decision this year aims at maintaining the relative shares in the portfolio substantially unchanged.

There should thus be more flexibility in foreign currency borrowing so that fluctuations in net borrowing can be countered with both nominal kronor-denominated and foreign currency borrowing.

The decision on the guidelines for the year 2000 may be modified should there be a major change in the circumstances on which the decision is based.

It can be argued that a traditional perspective in portfolio selection should be applied to the guidelines on managing the central government debt. In such cases the guidelines should aim at stating the structure of the debt at each point in time, that is, stating how the debt should be distributed among the different classes of debt, and what mandate the National Debt Office should have to deviate from the proportions specified.

An analysis of how the structure of the debt affects the absolute costs while taking risk into account and that results in a relatively good understanding of the debt portfolio's optimal structure naturally leads to the decision that the guidelines should also be drawn up in a way that is consistent with such an analysis, that is, in terms of the proportions of the various classes of debt.

One advantage of such an effort would be that changes in the borrowing requirement could be matched with a proportional change in the borrowing in the different classes of debt without needing to change the debt's properties with respect to cost and risk. The formulation of this year's guidelines on the whole allows only changes in the nominal debt denominated in kronor, as the amortisation rate of the foreign currency debt is stated in kronor. Therefo-

re swings in the borrowing requirement that are difficult to predict, rather than well-founded policy decisions based on opinions on assessments of risk versus return, will change the properties of the entire debt.

Last year the Government commissioned the National Debt Office, in consultation with the Ministry of Finance, to develop a simulation model to analyse how alternative structures of the central government debt portfolio affect costs and risks. In June 1999 the National Debt Office submitted a report on what was required for such a model and how it could be established. The report stressed that the National Debt Office intended to develop a model meeting its own specific requirements and that work on the model would take some time. Therefore in the work to design a quantitative basis for the decisions on the guidelines for 2000, Morgan Stanley Dean Witter was engaged. However the National Debt Office points out that the quantitative calculations carried out did not provide entirely unambiguous and significant conclusions of a quantitative nature. Nevertheless the results obtained from the external simulations as well as from the National Debt Office's own simulations have provided an important basis for the proposed guidelines that it has submitted.

The Government observes that an ambitious piece of work has been done to develop a quantitative basis before the decision on the guidelines for 2000, even if this work still has generally provided only indicative results. As an adequate empirical basis showing how the changes in the structure of the debt affect expected cost and risk in the central government debt portfolio is still lacking, the Government's possibilities for making a long-term decision on the desired direction that the structure of the debt should take and its duration are also limited this year. Therefore this year's decision is essentially being taken with a one-year decision horizon. The National Debt Office should continue its work developing a simulation model with the aim of putting together a more adequate quantitative basis prior to the decision on the guidelines for 2001.

Another complication that occurs when the guidelines are set in terms of proportions is that risks may arise that the management of

the currency borrowing may become increasingly expensive. The National Debt Office could, for example, run the risk of systematically borrowing and then amortising in foreign currency at unnecessarily high costs (contrary to the cost objective). A weakening of the krona means that the foreign currency share of the debt increases and the National Debt Office could then be forced to amortise and thus realise exchange rate losses. There is a risk that a strengthening of the krona would lead to new borrowing in foreign currency in a situation in which the krona is strong. Thus the decision on the guidelines should, at least for now, refer to an amount in Swedish kronor for the foreign currency borrowing.

The process of developing an adequate basis for making decisions has thus not yet come far enough for it to be possible to establish the debt's optimal structure. At this stage it is not meaningful to formulate the guidelines in terms of proportions of the debt. Such an attempt could give the false impression that the decision rested on a firmer foundation than is now the case.

A strict application of the guidelines as previously formulated, for example, referring to an amount in Swedish kronor for the foreign currency borrowing, limits the possibilities of using foreign currency borrowing as a cushion if the forecast of the borrowing requirement needs to be revised. Given the relatively thin and illiquid market for inflation-linked bonds, it would probably not be appropriate to use real borrowing instead as a flexible source of financing. Thus there is reason for giving the National Debt Office greater flexibility in foreign currency borrowing. Otherwise only the nominal borrowing denominated in kronor would remain as a financing buffer. Increased flexibility in the currency borrowing would make it possible to avoid major changes in the foreign currency share of the total debt, if the net borrowing result were to deviate significantly from the forecast. Accordingly increased flexibility can be seen as a step in the direction of an increased role for a traditional portfolio approach in the work on the guidelines. There are grounds for continuing the analysis of what approach should be chosen in the formulation of the guidelines. The issue of a possible real ap-

proach to debt management should be seen as part of such an analysis.

To sum up, it is the Government's view that there are very good reasons as to why it is not yet possible to make a well-founded assessment of what the desired proportions of the various debt instruments should be. Therefore the decision on the guidelines this year aims at maintaining the relative shares in the portfolio substantially unchanged. The flexibility in foreign currency borrowing should, according to this basis for the decision, be increased so that fluctuations in net borrowing can be countered by both nominal kronor-denominated and foreign currency borrowing.

The overall objective and the decision-making procedure for central government borrowing and the management of the central government debt were established in spring 1998. This means that the guidelines proposed by the National Debt Office, the Government's decision on guidelines and the future evaluation of the management of the central government debt should be seen as part of a process aimed at gradually improving methods, analytical work tools and decision variables for governance of the management of the central government debt.

The guidelines for 2000 are based on a number of assumptions associated with uncertainty. If developments were to deviate from these assumptions markedly, a reconsideration of the decision on the guidelines might be necessary during the year.

4 Guidelines on the Management of the Central Government Debt in 2000

4.1 The National Debt Office's Proposal and the Riksbank's Comments

The Guidelines Proposed by the National Debt Office

Given present assessments of the borrowing requirement, the National Debt Office proposes that the allocation of various classes of debt remain in principle unchanged from the decision on the guidelines for 1999.

The National Debt Office is proposing an increase in the pace of amortisation on the foreign currency debt to SEK 35 billion (from SEK 25 billion in 1999). The result, at constant exchange rates, will be a marginal reduction in the percentage of foreign currency debt. As a consequence of the uncertainty in the central government borrowing requirement for 2000 and in order to achieve flexibility in the amortisation of the foreign currency debt, the National Debt Office is proposing an increase in the interval around the amortisation of ± SEK 15 billion (from ± SEK 5 billion in 1999).

The National Debt Office is also proposing a reduction in the total duration of the debt denominated in kronor and the foreign currency debt to 2.7 years with an interval of ± 0.3 years at the end of 2000. At the end of 1999 the duration was estimated at over 2.9

years. The proposal is based on qualitative arguments and indicative partial quantitative analyses in which the reduction is judged to generate substantial cost savings, but to have a negligible effect on the level of risk in the central government debt. The proposed guidelines for real and nominal borrowing in kronor and for the maturity date profile are unchanged from the decision on the guidelines for 1999.

The Riksbank's Comments

In the opinion of the Riksbank's Executive Board, the proposal of the National Debt Office on the structure, duration and maturity date profile of the central government debt does not conflict with any monetary policy requirements. The Riksbank is also of the opinion that an increase in the pace of amortisation of the foreign currency debt to SEK 35 billion in 2000 is reasonable.

The Riksbank notes that the proposed interval for the amortisation of foreign currency debt (± SEK 15 billion) is considerably wider than the current interval. The size of the interval could create uncertainty when the foreign exchange market is unsettled. However the Riksbank believes that the increased interval will not affect the krona's exchange rate on condition that the interval is managed in a transparent manner and that the Riksbank in future continues to follow current exchange procedures.

Furthermore the Riksbank assumes that the outcome of the central government budget will decide how much of the interval will be used and that unforeseen budget surpluses will be divided proportionately between the nominal kronor-denominated debt and the foreign currency debt. In the event that the interval is used, the Executive Board is of the opinion that it is necessary for the National Debt Office to supplement its public forecasts with revisions of the foreign currency amortisations.

4.2 The Government's Decision

The Foreign Currency Debt

The Governments decision: The foreign currency debt will be amortised by an amount equivalent to SEK 25 billion during 2000. The Swedish National Debt Office may deviate plus or minus SEK 15 billion from this amount. The main reason for the increased flexibility compared to the previous year is to avoid major shifts in the proportion of foreign currency borrowing owing to deviations from the borrowing forecast.

The National Debt Office should publicly report its plans for the implementation of its mandate for foreign currency borrowing, as well as possible modifications to these plans.

As mentioned above, a relatively large percentage of the central government debt consists of borrowing in foreign currencies. By the close of 1999 the foreign currency debt is estimated to amount to more than 29 per cent of the total central government debt, when the value of the derivative portfolio is included. The Government has decided annually since 1993 on the size of central government foreign currency borrowing. Table 2 shows the guidelines for foreign currency borrowing in the past few years.

The National Debt Office is of the opinion that there are grounds for a long-term drawdown of the foreign currency debt. One reason for this is that foreign currency loans have a higher risk than kronor-denominated borrowing, even though there is not any systematic cost difference in the long term. Foreign currency borrowing has a higher risk as exchange rate fluctuations directly affect the value of the foreign currency debt and thus the total debt and debt ratio. During periods of economic and political uncertainty, significant risk premiums may be associated with borrowing in the do-

mestic currency that make kronor-denominated borrowing more expensive. Even though there is still some difference in interest costs, the budget consolidation and low inflation have changed the picture.

Table 2. The Government's Annual Decision on Net Foreign Currency Borrowing, Outcome, Changes in the Foreign Currency Debt in Kronor (Including Valuation at Current Exchange Rates) and Net Borrowing, SEK billions

	1994	1995	1996	1997	1998	1999	2000	2001
Guidelines for foreign currency borrowing	25	>30	>20	0	-25	-25	-25	
Actual foreign currency borrowing, net	32.0	43.8	30.0	-2.5	-26.4	-25.0		
Foreign Currency Debt change in value	24.4	19.2	24.7	9.5	-23.6	-60.4		
Central government net borrowing	184.9	138.6	21.0	6.2	-9.7	-55.3	-82.5	-81.0

Note: Figures for 1999-2001 represent forecasts as per the 2000 Budget Bill. The change in the value of the foreign currency debt is comprised of foreign currency borrowing (net) and valuation of the debt including the derivatives portfolio at current exchange rates.

Foreign currency borrowing is a flexible instrument. As the Kingdom of Sweden is a small player in the international foreign exchange market, borrowing can be increased rapidly if required. However to be able to make use of this flexibility, the foreign currency debt must not be too big to start with.

In addition the National Debt Office states that the upcoming transfers from the National Insurance Pension Fund (especially in the form of bonds denominated in kronor) will raise the percentage of foreign currency debt. For these reasons and because of the budget surpluses anticipated for 2000 and 2001, the National Debt Office is of the opinion that the pace of amortisation should be increased from SEK 25 billion to SEK 35 billion.

Last year the Government's starting point for its decision on the guidelines was that the proportion of various types of debt in the central government debt portfolio would remain unchanged. The reason for this was that the basis for determining the optimal long-

term structure of the portfolio was insufficient and hence it was not possible to state the direction in which the share of the debt denominated in foreign currency should be developed.

The Government stated that the foreign currency debt would be amortised by SEK 25 billion in 1999. The reason for this was that transfers from the National Insurance Pension Fund to be carried out at the beginning of 2001 would push up the percentage of foreign currency debt. To counter this increase, it was proposed to begin the amortisation in 1999. In the 1999 Budget Bill net borrowing in 2001 was estimated at over SEK 200 billion. A similar estimate had also been made in 1998 prior to the 1999 guidelines on foreign currency borrowing.

The profile for central government net borrowing is now deemed to differ from the estimates prior to the decision on the guidelines for 1999. The amortisation of the central government debt in 1999 will be larger than previously forecast. At the same time the amortisation in 2001 will be substantially lower, one reason being that the transfer from the National Insurance Pension Fund will be less than previously expected. The need to reduce the foreign currency debt in order to counter an increase in the percentage of foreign currency debt in 2001 has thus diminished. According to current estimates, the increase in the pace of amortisation to SEK 25 billion a year that was introduced in 1998 is sufficient to counteract a rise in the percentage of foreign currency debt in 2001. The net borrowing forecast for 2002 points to a considerably lower budget surplus than those estimated for 2000 and 2001. This argues against an increase in the pace of the amortisation of the foreign currency debt.

As previously stated it is the Government's view that a basis for taking a position on the optimal long-term share of foreign currency borrowing is still lacking. Given constant exchange rates, a net amortisation of foreign currency borrowing of SEK 25 billion would result in the proportion of foreign currency borrowing in relation to the total central government debt remaining largely unchanged.

There are additional reasons why a reduction in the percentage of foreign currency debt is not obvious. The National Debt Office states that foreign currency borrowing permits more diversification

compared with kronor-denominated borrowing. Borrowing in several currencies implies that exposure to increases in the interest rate level in one particular country decreases. It is thus possible to take advantage of the fact that short-term interest rates on average are lower than long-term rates, that is, it is not necessary to pay the risk premium normally thought to be required in long-term borrowing. This indicates that, in principle, foreign currency borrowing is cheap in spite of the long-standing difference in interest rates–for example, between Swedish and German bond rates. However the risk premium that the National Debt Office normally is thought to need to pay for borrowing in kronor compared with certain other currencies and that is largely attributable to the exchange rate risk does not constitute a clear argument for preferring foreign currency borrowing. Foreign currency borrowing means that the State has to bear the increased risk of exchange-rate losses associated with loans in currencies other than the krona.

These arguments illustrate the uncertainty in determining the optimal percentage of foreign currency borrowing in the debt portfolio. Therefore the Government believes that there are convincing arguments for a rate of amortisation that in principle is expected to leave the percentage of foreign currency borrowing unchanged. However the Government is of the opinion that it is important to continue the analysis with the aim of creating a better basis for deciding the desired proportion of foreign currency debt.

As before, the Government is also of the opinion that it is appropriate to give the National Debt Office some flexibility in applying the decision on the amortisation of the foreign currency debt. The National Debt Office argues that the possibility for deviation upward and downward should be increased from SEK 5 billion to SEK 15 billion. The most important reason is the considerable uncertainty in the forecast for net borrowing in the year 2000. In the 2000 Budget Bill, net borrowing is estimated at SEK 82.5 billion. The sale of public enterprises is expected to account for the entire surplus of SEK 95 billion. Thus the forecast is to a large extent dependent on the sale of individual enterprises.

In hindsight the forecast for net borrowing in 1999 turned out to be very uncertain, partly as a result of the change in the assumption for the size of sales by the State. The National Debt Office points out that the forecast has varied between SEK 20 billion and SEK 90 billion in the course of only one year. If the amortisation of the foreign currency debt is fixed with only a little room for deviations, then kronor-denominated borrowing has to bear the entire weight of changes in the borrowing requirement. In order to avoid large fluctuations in the market for kronor, including risks for a deterioration in liquidity or major changes in volumes issued, there are grounds for letting both foreign currency borrowing and kronor-denominated borrowing fluctuate to counter unforeseen changes in the budget balance.

The Riksbank considers the greater flexibility proposed by the National Debt Office to be reasonable, but points out that transparency around this interval and the manner in which it is to be handled are important. The Bank assumes that it is the budget outcome that governs how large a part of the interval will be made use of and that the National Debt Office will supplement its public forecasts with modifications to the amortisation of the foreign currency debt, if any, at least semi-annually.

The Government concludes that a permissible deviation of SEK 15 billion from the target for the amortisation of the foreign currency borrowing is appropriate. The main reason for the greater flexibility is the uncertainty about the forecast for the budget balance, even though cost and risk considerations should also be able to be taken into account in the position taken by the National Debt Office on how large a part of the interval will be made use of. The benchmark of SEK 25 billion can thus be seen as dependent on the borrowing forecast. It is reasonable for the National Debt Office to report publicly on how the mandate on foreign currency borrowing is meant to be utilised, as well as possible modifications to these plans.

Inflation-Linked Kronor-Denominated Borrowing

The Government's decision: The outstanding stock of inflation-linked borrowing will not be reduced in 2000. However a reduction might be permitted for reasons of promoting more efficient markets.

The guidelines for the current year state that the stock of inflation-linked loans will not be reduced. However a reduction is permitted for reasons of promoting more efficient markets. In 1999 the National Debt Office has switched from so-called on-tap sales to auctions of inflation-linked bonds, which will contribute to an increase in the stock of inflation-linked loans. However the National Debt Office believes that the market is still small and the demand is uncertain at reasonable real interest rate levels in relation to prevailing nominal interest rates. Therefore inflation-linked bonds appear to be a relatively expensive form of borrowing at present. Hence the National Debt Office sees no reason for proposing changes to the guideline on inflation-linked borrowing.

The Government agrees with the National Debt Office's assessment and is of the opinion that the stock of inflation-linked borrowing should not decline in 2000. Therefore this year's decision on the guidelines, like last year's, establishes a floor for inflation-linked borrowing. However the Government considers it important to maintain the market for inflation-linked borrowing, especially given a possible future change-over to real risk measurement in the management of the central government debt. In order that the floor for inflation-linked borrowing does not constitute too much of a restriction, future consideration of a functioning market for inflation-linked bonds could therefore also mean that the reported inflation-linked debt will decline. However there is nothing to prevent the National Debt Office from increasing inflation-linked borrowing if the terms of issuance are favourable and if it is otherwise consistent with the cost minimisation objective.

Nominal Kronor-Denominated Borrowing

The Government's decision: The State's financing needs will otherwise be met by nominal kronor-denominated borrowing.

The Government shares the National Debt Office's view that in the future nominal borrowing will also represent a principal source of central government financing of its debt and that the National Debt Office, which is a dominant actor, is responsible for maintaining a well-functioning market for kronor-denominated borrowing. Therefore the principles of predictability and transparency in the National Debt Office's market interventions are also important components in the maintenance of the market for kronor denominated debt. In this year's decision on the guidelines, the nominal kronor-denominated debt also represents an important residual between central government borrowing requirements and borrowing in foreign currency and inflation-linked bonds.

However the Government thinks that the specified interval around the benchmark for the amortisation of the foreign currency debt increases the National Debt Office's possibilities for spreading the uncertainty in the central government borrowing requirement between the markets for kronor-denominated and foreign currency borrowing. Hence this flexibility furthers the National Debt Office's possibilities of acting predictably and transparently in the market for kronor and of conducting market maintenance. The Government is of the opinion that the guideline for the nominal kronor-denominated borrowing for the year 2000 can remain unchanged.

Maturity

The Government's decision: The average duration of the nominal kronor-denominated debt, inclusive of borrowing on the domestic retail market, and foreign currency debt will be 2.7 years at the end of 2000. The National Debt Office in its management of the debt is allowed to deviate upward or downward from this benchmark by 0.3 years.

The maturity for inflation-linked bonds should be a minimum of eight years, or longer.

The guidelines for 1999 stated that the maturity would be measured as the average interest fixing period for the nominal kronor-denominated debt and the foreign currency debt taken as a whole. In the benchmark portfolios for both classes of debt, the Board of the National Debt Office has chosen various maturities (approximately four years and 2.5 years for the kronor-denominated and the foreign currency debts respectively). Their motive is that there can be more diversification of the debt in foreign currency, which reduces the risk. In this way the National Debt Office thinks it can make use of the expectation that short-term interest rates will be lower than long-term rates in the long run. Accordingly reasons of cost explain the choice of different maturities.

Even though the National Debt Office has reasons for applying different maturities to the two classes of debt, it finds the arguments on balance speak in favour of the guidelines giving only a target for the kronor-denominated and foreign currency debts considered as a whole. It would be inappropriate to include too many details. The Government shares the assessment of the National Debt Office. The Government's decision on risk-taking in relation to expected cost should be given on an overall level and should refer to the debt as a whole in order to represent a balance between the objectives of minimising costs and taking risks into consideration. Guidelines that included several benchmarks would involve the Government in making a decision on the choice of portfolios at a relatively detailed level. Such decisions should be made by the National Debt Office

on the basis of a professional evaluation of costs and risks. Possible decisions by the National Debt Office on several benchmarks that differ with respect to maturity should be explained and evaluated in terms of cost and risk considerations.

Table 3 shows the average maturities for the nominal kronor-denominated debt and the foreign currency debt measured with two different measurements: duration and average interest fixing period. At the end of 1999 the average duration is estimated at over 2.9 years, of which the duration of the nominal kronor-denominated debt comes to 3.2 years and the duration of the foreign currency debt comes to 2.2 years.

Table 3. Remaining Average Maturity on the Nominal Part of the Central Government Debt at Year End

	1995	1996	1997	1998	1999
Duration	3.2	3.2	3.1	3.1	2.9
Average interest fixing period	3.8	3.8	3.7	3.5	3.5

The National Debt Office proposes that duration (measured in years) in the Government's guidelines should replace the average interest fixing period as the measure of maturity. Both represent measures of the average period of a bond's future cash flows (coupons and redemptions). The difference is that whereas duration is calculated by the time to each cash flow weighted for the present value of the cash flow, the average interest fixing period is estimated by the time to the cash flows weighted using nominal values without discounting. Thus the interest rate level affects the duration. The change in measures of maturity is warranted because the duration is a more practical work tool for determining the average maturity and interest rate risk. In addition it is made clear in a more explicit way that market value should be used in the evaluation of the National Debt Office's operational debt management in relation to defined benchmark portfolios. The market value of the debt represents precisely the present value of the cash flows. The Government shares the view of the National Debt Office that duration is a more suitable measure of the maturity.

The National Debt Office proposes a duration of 2.7 years (± 0.3 years) at the end of the year 2000 for the nominal kronor-denominated debt and the foreign currency debt combined. This implies some reduction in the forecast duration of over 2.9 years at the end of 1999.

The National Debt Office's proposal is based on the assumption that the long-term yield curve has a positive slope and that a reduced maturity thus lowers the expected costs of managing the debt. However this happens at the cost of a certain increase in risk, measured as increased volatility in the average running-yield-to-maturity. The National Debt Office views the increased risk as negligible. Also the model-based analysis that was used provides some support for the proposed reduction in the maturity. However the results obtained from the model should be interpreted with caution as the model only includes the nominal kronor-denominated debt and thus does not provide an analysis of the total risk in the portfolio.

According to the National Debt Office, there are additional reasons for reducing the maturity somewhat. A shorter maturity leads to a lower expected cost but the price is a higher risk. The improvement in central government finances means that the State could be prepared to increase the risk somewhat. Strong central government finances make possible a different balance between cost and risk in the central government debt. A second reason is that the larger surpluses expected will permit the acceptance of a larger decline in the debt without increasing the refinancing risk. A third reason is that the quantitative analyses done by the National Debt Office indicate that a reduced maturity may be effected with only a small increase in the risk. The model indicates that a higher risk in the form of increased fluctuation in the average running-yield-to-maturity would first be noticeable when a drop in the duration of the debt approached two years. A smaller drawdown of duration may thus take place without an obvious increase in the risk.

At the same time the National Debt Office stresses that some caution is called for. Expected cost savings as a consequence of a shorter duration have to be weighed against the need to preserve a

long-term borrowing strategy with the aim of promoting market liquidity and the way in which the market functions, among other things. The National Debt Office has taken these aspects into account in its proposal on duration.

The Government's view is that the stability of central government finances indicates that a limited increase in the risk may be warranted. The extension of the maturity implemented in 1993 and 1994 was warranted by such factors as the uncertainty created by the rapid rise in the borrowing requirement. The reduction in the maturity of the central government debt that the National Debt Office is proposing is small and therefore the increase in risk could be considered marginal. It can also be argued that such a reduction may lead to somewhat lower costs in the long term.

As to inflation-linked borrowing, the National Debt Office is proposing that the guideline for the current year should also apply from now on and that inflation-linked borrowing should take place with maturities of at least eight years. The Government's view is that there are no strong reasons for specifying a guideline for duration in inflation–linked borrowing. The market for inflation-linked bonds is still uncertain, a situation which may be expected to make the National Debt Office's possibilities of determining the duration of the inflation-linked debt more difficult. The Government shares the assessment of the National Debt Office that the maturity for inflation-linked bonds should be a minimum of eight years, or longer.

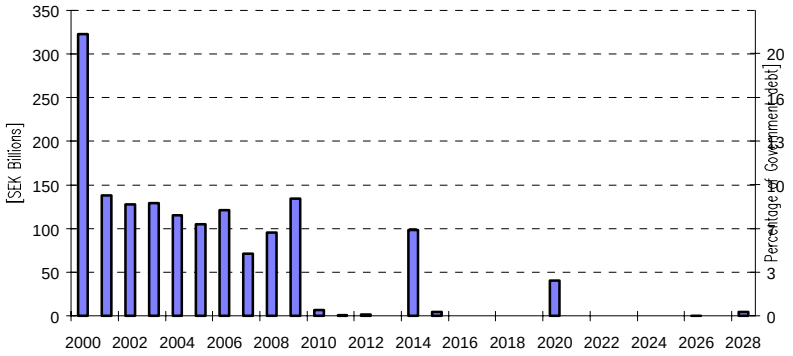
Maturity Date Profile

The Government's decision: A maximum of 30 per cent of the entire debt will be allowed to mature within the next twelve months. However the National Debt Office will manage the borrowing such that no more than 25 per cent of the central government debt comes due in the above-mentioned period.

As reported above the Government is of the opinion that the average maturity of the combined debt denominated in kronor and the foreign currency debt can be shortened compared with last year's decision on the guideline. However it should be pointed out that the measure of duration does not entirely capture the refinancing risk as a certain duration can in principle be achieved in an infinite number of ways (for example, by limiting the debt to a few maturities).

Diagram 1 below shows that part of the central government debt projected to fall due each year. The basis is the projected composition of the debt as of December 31, 1999. More than SEK 320 billion (over 21 per cent), which is a relatively large proportion of the debt, is estimated to fall due in 2000. The reason for this is that the National Debt Office has chosen to finance a part of the central government debt with short-term borrowing instruments denominated both in Swedish kronor (treasury bills) and in foreign currency (commercial paper). This strategy means that the percentage of the central government debt maturing in the next 12 months will always be larger than that maturing in subsequent years.

Diagram 1. Projected Maturity Date Profile of the Central Government Debt at Year End 1999 (SEK billions and as a percent of the central government debt)



The Government is of the opinion that it is reasonable to spread over time the refinancing of loans falling due in order to decrease the risk of having to refinance a large part of the debt when interest rate levels are high. Even from a market maintenance perspective, it is appropriate to spread the borrowing over several maturities. These guidelines can be seen as a complement to the decision on the duration's length. The guidelines for the maturity date profile for the year 2000 will thus remain unchanged so that a maximum of 30 per cent of the central government debt will be allowed to mature during the next 12 months. However the National Debt Office will manage the borrowing so that no more than 25 per cent of the central government debt comes due in the above-mentioned period.

5 The Evaluation of Central Government Debt Management in 2000

The Government's decision: The Board of the National Debt Office will establish benchmark portfolios for nominal kronor-denominated borrowing and for foreign currency borrowing. The choice of the benchmarks' duration will be evaluated quantitatively and qualitatively. The quantitative evaluation will refer to the differences in the absolute costs compared with the Government's guidelines. The evaluation will also take risk into consideration.

The day-to-day management of the debt will be evaluated quantitatively. The costs of managing the debt will in that respect be related to the hypothetical strategy that has been put into concrete form in the benchmark portfolios. The quantitative evaluation will also take risk into consideration. The quantitative evaluation will be supplemented by a qualitative evaluation, including the National Debt Office's market maintenance efforts.

Major deviations from the forecast for net borrowing should be taken into account in the evaluation of foreign currency borrowing.

In recent years borrowing and debt management on the part of the National Debt Office have been appraised with the help of two benchmark portfolios. The portfolios were established by the Board of the National Debt Office and refer partly to the nominal debt denominated in kronor and partly to the foreign currency debt. These benchmark portfolios reflect a hypothetical, standardised bor-

rowing strategy. In evaluating the results obtained by the National Debt Office, the actual costs of the debt and the hypothetical costs estimated for the benchmark portfolios are compared. There has not been any evaluation of the decisions on the formulation of the benchmarks.

The law on central government borrowing and debt management stipulates that every year the Government will evaluate the management of the central government debt in a written communication to the Riksdag. The evaluation aims at providing control over the actual conduct of central government debt management and making an assessment possible. An evaluation provides guidance for future decisions. Therefore it is also important in a forward-looking perspective. In addition regularly recurring evaluations provide good incentives for efficient debt management. The evaluation will be done using a long-term perspective. As stated in the Government Bill (prop. 1997/98:154) on the management of the central government debt, this means that the National Debt Office's management will from now on also be evaluated over moving five-year periods. The Government's evaluation will concern both the decisions taken by the Board of the National Debt Office and the decisions taken at the operational level.

In addition to the Government's evaluation of the National Debt Office, the written communication submitted to the Riksdag will also include an evaluation of the Government's overall guidelines. It is the Government's view that such an evaluation should be based on the objective of minimising the costs in managing the debt while taking risk into account and having the absolute costs in view. The evaluation will include a comparison with (hypothetical) costs for several alternative guidelines. The comparison will be directed primarily towards costs and risk in an unchanged debt portfolio, as well as referring to dividing up the debt by class and by maturity. Finally the Board of the National Debt Office has the opportunity to evaluate the day-to-day management. Thus the evaluation of the central government debt policy will take place at several levels.

The decision on the guidelines for 1999 stipulated that the management by the National Debt Office would be evaluated against a

benchmark portfolio for the combined debt. As a starting point it was stated that the management of the central government debt will be seen as a whole and that it is therefore the total costs and the collective risk that will be taken into account. The National Debt Office was thus given the opportunity to redistribute costs and risks between different parts of the central government debt portfolio. The previous model did not provide room for sufficient flexibility and prevented a comprehensive view.

In the decisions on the guidelines proposed by the National Debt Office for 2000, it was stated that the evaluation of debt management by the National Debt Office should be done in two stages. On the decision on the guidelines, it is proposed that the Board of the National Debt Office distribute the duration decided by the Government between the two classes of debt: that denominated in kronors and the foreign currency debt. In the view of the National Debt Office, it is not appropriate to define a benchmark portfolio for the combined kronor-denominated and foreign currency debt and to evaluate the result in relative terms in the event that both classes of debt have the same duration. A decision to distribute the duration between the classes of debt by defining two separate benchmark portfolios should be evaluated based primarily on the effects on the absolute costs with consideration given to risk. In a second stage the deviations from the benchmarks established should be evaluated. The Government shares this view of the evaluation process.

The increased flexibility that the National Debt Office has received in the form of greater possibilities for deviating from the benchmark for amortising the foreign currency debt principally aims to parry deviations from the forecast for central government net borrowing. However the flexibility could also be utilised to improve compliance with objectives. An adjustment in foreign currency borrowing for major changes in the borrowing requirement should be taken into account in the evaluation. By way of example, this may be done by adjusting the guidelines to amortise SEK 25 billion of the foreign currency debt in an appropriate way with respect to deviations from the borrowing forecast.

Deviations from such an adjusted benchmark for the foreign currency borrowing can be evaluated in terms of differences in the average running-yield-to-maturity and can be expressed in kronor.

The greater flexibility that the preceding year's decision on the guidelines intended to create by commissioning the National Debt Office to design a benchmark portfolio for the combined nominal kronor-denominated and foreign currency debt can thus in principle be achieved both by the Board of the National Debt Office's discretionary decisions on the distribution of the combined duration among different benchmark portfolios as stated in the guidelines and by deviations from the benchmark for the amortisation of the foreign currency debt.

The benchmark portfolios established by the Board of the National Debt Office will govern the management of each portfolio. The outcome should then as usual be evaluated by comparing the costs of the actual nominal debt denominated in kronor and the foreign currency debt with the costs of each benchmark portfolio in terms of market value. The result measures the extent to which deviations from the benchmark portfolio lead to lower or higher costs in relative terms.

This evaluation should be complemented by a qualitative analysis that includes the market maintenance efforts made by the National Debt Office. Such measures aim at improving the functioning of the market and thus can be expected to lead to lower interest rate levels in the Swedish markets. Thus the value of the hypothetical benchmark portfolio is also affected, and therefore a quantitative relative cost comparison with respect to the market maintenance efforts is not possible.

6 Technical Appendix: Definitions of Main Concepts

Foreign Currency Borrowing

The mandate for foreign currency borrowing laid down in the guidelines on the management of the central government debt is defined in terms of flows. An amortisation of the foreign currency debt consists of the net of the amounts falling due and the amounts borrowed as regards both loans and derivative instruments, valued at the exchange rates in effect on the transaction day. This means that all foreign currency flows are included in the foreign currency mandate; for example, in swaps between kronor and foreign currencies, the foreign currency part of the swap is included in the foreign currency mandate, while the kronor part is included in the kronor-denominated debt. Unrealised revaluations of the debt owing to exchange rates are not counted in the amortisation of the foreign currency debt as stated in the guidelines. This means that an amortisation in terms of the foreign currency mandate does not ex post equal the change that can be measured in the value of the outstanding debt during the same period, as the outstanding debt also contains unrealised exchange rate revaluations.

Market Value Costs, Average Running-Yield-To-Maturity and Periodicised Costs per Period

The market value cost over a given period is defined as the difference between the debt's market value at the beginning and at the end of the period plus any interest coupons paid out in the period. It thus follows that the cost increases if the market value of the debt increases and decreases if the market value of the debt falls. The average running-yield-to-maturity is defined as a weighted average of the running-yield-to maturity rates in the debt portfolio. The weights are composed of the nominal value of the securities. The running-yield-to-maturity is the interest cost at which a security was issued. Thus according to this measure, the costs are stated in the form of an interest rate level expressed as a percentage.

Periodicised costs state the cost in kronor, when the interest payments for each instrument are evenly spread over the maturity for each instrument. Periodicised costs are the interest costs that are included in central government net lending. Included in this concept are the current interest payments on the central government debt and positive and negative price differences from par on the exchange rate in effect at issuance, evenly spread over the loans' time to maturity. However capital gains and losses at early redemption of loans and realised exchange rate gains or losses are not included in the periodicised costs that affect net lending. If the periodicised costs for a certain period are divided by the average nominal debt for the same period, a value close to the average running-yield-to-maturity will be obtained.

Risk Measures

For every measure of cost, there is a corresponding measure of risk. The risk of an unfavourable outcome in terms of changes in market value can be quantified using Value-at-Risk, VaR, which, somewhat simplified, is the maximum loss that could be suffered at a specified probability. For example for a particular borrowing strategy, it could be said that there was a 95 per cent certainty that the

largest market value loss during one year would be SEK 5 billion. Similarly Running-Yield-at-Risk can be defined as the highest possible average running-yield-to-maturity obtainable at a given probability and for a given borrowing strategy. Finally Financial-Savings-at-Risk is the largest cost that can arise, defined as the effect on net lending.

Average Interest Fixing Period and Duration

Both the average interest fixing period and duration are used to measure the length of the debt. In both measures the debt's average remaining time to maturity is calculated by multiplying the time to each cash flow (coupons and redemptions) by the size of the cash flow. The difference between the measures is that for duration, the time to the cash flows is multiplied by the present value of the cash flows, whereas in the case of the average interest fixing period it is multiplied by nominal amounts. As the present values of the future cash flows depend on the interest rate level, the duration is consequently dependent on the interest rate level, which is not true of the average interest fixing period.

For a zero coupon bond, the average interest fixing period is the same as duration, whereas for a coupon bond the duration is lower than the average interest fixing period. There are two different definitions of duration. The National Debt Office's target duration is expressed as Macauley duration, which means that the obligation's yield-to-maturity is used to calculate the present value of the future cash flows. Macauley duration is generally expressed in years.

Maturity Date Profile

The maturity date profile is defined in terms of how large a percentage of the outstanding stock at the time of measurement has maturities within the prescribed maturity interval. In practice the maturity date profile is measured at the end of each month. The cash balance, which shows levels that on a daily basis in individual months may

move from deficits of about SEK 35 to 40 billion to surpluses of the same magnitude, is estimated ex ante to be at an average level with a deficit of SEK 15 billion. However the cash balance changes in a predictable manner over the months. Accordingly it is known at what approximate level that amounts fall due for a twelve-month period on those days when the deficit in the cash balance is at its largest. For short-term borrowing (principally call loans and treasury bills with a maturity of less than 12 months), which are refinanced during the year, only the volumes that are outstanding at each time of measurement are included. The maturity date profile thus gives an on-the-spot account of the total outstanding volume that will fall due within 12 months of a particular day. The net maturities of derivative instruments have been estimated at zero in the calculations. The net values appear only as a result of exchange rate fluctuations, and as the exchange rates at the due dates are not known in advance, zero is a reasonable forecast.

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