RIKSGÄLDEN
SWEDISH NATIONAL DEBT OFFICE

30 september 2020

CENTRAL GOVERNMENT DEBT MANAGEMENT

Proposed Guidelines 2021–2024

The Swedish National Debt Office's mandate

One of the Debt Office's primary responsibilities is to borrow money on behalf of the central government and manage the central government debt. The objective is to minimise the cost over the long-term while taking account of risk. The management of the debt shall be conducted within the framework of monetary policy requirements.

At the general level, debt management is governed by the Swedish Budget Act and the Ordinance Containing Instructions for the Swedish National Debt Office. These statutes set out, for example, the permitted purposes of central government borrowing and the objective of the debt management. In addition, the Swedish Government adopts guidelines for this management that govern matters including the composition and maturity of the debt.

The Government adopts new guidelines each year no later than 15 November. This decision is taken after the Debt Office has submitted proposed guidelines on which the Riksbank has been given the opportunity to deliver an opinion.

The operational role of the Debt Office then includes borrowing the money required, in accordance with the framework set up, to finance deficits in the central government budget and replace loans that mature.

After the end of the year, the Debt Office submits a basis for evaluation of its debt management to the Government in February. The Government then presents an evaluation to the Riksdag (the Swedish Parliament) in April every other year.

The proposed guidelines and the basis for evaluation are published on riksgalden.se.

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Summary

- As a result of the economic impact of the coronavirus, and government support measures, the central government debt is expected to increase substantially in 2020 and 2021. Because the increase is assessed to be temporary, however, there are no proposed changes to the guidelines. The changes made to the guidelines in recent years have led to a more comprehensive approach to guiding the debt management, which now provides flexibility in meeting both a rapidly growing borrowing requirement and increased uncertainty.
- The Debt Office plans to meet the increased borrowing requirement mainly by increasing the short-term borrowing. The issuance volume of government bonds is also being increased and can be supplemented with bond borrowing in foreign currency, which in that case are hedged.
- Despite the supply being expected to increase relatively quickly, the market for government bonds has so far functioned well. There is great demand for Swedish government securities and the auctions have been oversubscribed. Even if the Riksbank continues its asset purchases, the net supply is expected to increase in periods ahead, which will hopefully contribute to improving liquidity in the government bond market. From a longer-term perspective, however, the problem remains and market liquidity will continue to be a factor to take into account in managing the central government debt.
- The review of the size of the foreign currency debt is still underway. It is proposed that the target value for the foreign currency exposure remain unchanged until the work of the ongoing review is completed. However, a clarification of the wording regarding the size of the foreign currency debt is proposed.

  The background to the proposed wording clarification is that the Debt Office must manage changes in the foreign currency exposure that arise on a continual basis. These entail, among other things, interest payments on foreign currency loans, coordination of payments for EU-payment transactions, other agencies' foreign currency hedges and the central government's multi-currency cash pool. The net deviation from the targeted exposure that arises is reconciled through currency exchange transactions in order to restore the central government's currency exposure to its long-term level. In the interest of the predictability of the Debt Office's foreign currency operations, the transactions are spread out over time instead of being made immediately when the deviation occurs. This, in turn, means that the foreign currency debt varies over the short term even as the long-term level remains unchanged. In order to clarify what is meant by the statement that the foreign currency exposure is to be unchanged, an slight amendment has been added to point 12 in the guidelines.

Proposed Guidelines 2021–2024

The proposed guidelines for central government debt management presented here are for 2021–2024. For the years 2022–2024, the proposal is for preliminary guidelines. Where there are proposed revisions to the current guidelines, the present wording is in the left column and the proposed new wording in the right column. In order to provide an overview of the framework that governs the debt management, the relevant parts of the Budget Act and the Ordinance Containing Instructions for the Debt Office are also included.

Objective of central government debt management

1. The objective of managing the central government debt is to minimise the cost of the debt over the long-term while taking account of the risk in its management. The central government debt must be managed within the framework of monetary policy requirements.
   Budget Act (2011:203).

Debt Office's mandate and purposes of the borrowing

2. The Debt Office is tasked with raising and managing loans for the central government in accordance with the Budget Act. *Ordinance (2007:1447) Containing Instructions for the National Debt Office*.

3. Under the Budget Act, the Debt Office may raise loans for the central government in order to:
   - finance current deficits in the central government budget and other expenditure based on decisions of the Riksdag (the Swedish Parliament)
   - provide such credits and perform such guarantees as decided by the Riksdag
   - amortise, redeem and buy back central government loans
   - meet the need for government securities at different maturities in consultation with the Riksbank
   - meet the Riksbank's need for foreign currency reserves

Guidelines process

4. The Debt Office shall submit proposed guidelines for central government debt management to the Government no later than 1 October each year. *Ordinance Containing Instructions for the National Debt Office*.

5. The Government shall request an opinion from the Riksbank on the Debt Office's proposal. *Budget Act*.

6. The Government shall adopt guidelines for the Debt Office's management of the central government debt no later than 15 November each year. *Budget Act*.

7. The Debt Office shall submit information for the evaluation of the management of central government debt to the Government no later than 22 February each year. *Ordinance Containing Instructions for the National Debt Office*.

8. The Government shall evaluate the management of the central government debt every other year. The evaluation shall be presented to the Riksdag no later than 25 April. *Budget Act*.

9. The Debt Office shall establish principles for the implementation of the guidelines for central government debt management adopted by the Government. *Ordinance Containing Instructions for the National Debt Office*.

10. The Debt Office shall establish internal guidelines based on the guidelines from the Government. These decisions are to concern the use of the mandate for position taking, the term to maturity of individual debt types, the currency distribution of the foreign currency debt, and principles for market support and debt maintenance.

Composition of the central government debt – debt shares

11. The proportion of inflation-linked krona debt is to be 20 per cent of the central government debt over the long term. The shares of the debt types in the central government debt are to be calculated as nominal amounts at the present exchange rate including accrued inflation compensation.

Present wording:

12. The foreign currency exposure of the central government debt is to be unchanged. The exposure is to be calculated in a way that excludes changes in the krona exchange rate.

Proposed new wording:

12. The foreign currency exposure of the central government debt is to be unchanged. The exposure is to be calculated in a way that excludes changes in the krona exchange rate. *The foreign currency exposure may, however, vary as a result of the Debt Office making currency exchanges in accordance with point 36.*

13. The Debt Office shall set a target value for the distribution of the foreign currency debt among different currencies.

14. In addition to inflation-linked krona debt and foreign currency debt, central government debt is to be composed of nominal krona debt.

Term to maturity of the central government debt

15. The term to maturity of the central government debt is to be between 3.5 and 6 years.

16. The Debt Office shall determine a term-to-maturity interval for the nominal krona debt, the inflation-linked krona debt, and the foreign currency debt.

17. The term to maturity of the central government debt may deviate temporarily from the maturity interval stated in point 15.

18. Term to maturity is to be measured as duration.

Cost and risk

19. The trade-off between expected cost and risk is to primarily be made through the choice of the composition and term to maturity of the central government debt.

20. The main cost measure is to be the average issue yield. The cost is to be calculated using the valuation principle of amortised cost taking into account exchange rate changes and accrued inflation.

21. The main risk measure is to be variation in the average issue yield.

22. The Debt Office shall take account of refinancing risks in the management of the central government debt, including by issuing instruments with more than twelve years to maturity.

23. Borrowing is to be conducted in a way that ensures a broad investor base and diversification in a range of funding currencies in order to maintain good borrowing preparedness.

24. Positions are not to be included in the calculation of debt shares and term to maturity.

25. When taking positions, market values are to be used as the measure of cost and risk in the management of the debt.

Market support and debt maintenance

26. The Debt Office shall contribute, through its market support and debt maintenance, to the effective functioning of the government securities market in order to achieve the objective of long-term cost minimisation while taking account of risk.

27. The Debt Office shall establish principles for market support and debt maintenance.

Position taking

28. The Debt Office may take positions in foreign currency and the krona exchange rate.

    Positions in foreign currency may only be taken using derivative instruments. Positions may not be taken in the Swedish fixed income market.

    Positions refer to transactions that are intended to reduce the costs of the central government debt while taking account of risk, or to reduce the risks for the central government debt while taking account of cost, and that are not motivated by underlying borrowing or investment requirements.

    Positions may only be taken in markets that permit the management of market risk through liquid and otherwise well-developed derivative instruments that are also potentially a borrowing currency in the context of debt management.

29. Positions in foreign currency are limited to SEK 300 million, measured as daily Value-at-Risk at 95 per cent probability.

    The Debt Office shall decide how much of this scope may be used at most in day-to-day management.

31. Positions in the krona exchange rate are limited to a maximum of SEK 7.5 billion. When the positions are built up or wound down, this is to be done gradually and announced in advance.

    The Debt Office shall decide how much of this volume may be used at most in continuous management in connection with exchanges between the krona and other currencies. This volume is to be of a limited size and the positions do not need to be announced in advance.

Borrowing to meet the need for central government securities

32. The possibility of raising loans to meet the need for government securities under Chapter 5, Section 1 of the Budget Act may only be exercised if necessary in the event of a threat to the functioning of the financial market. The Debt Office may have outstanding securities with a maximum nominal value of SEK 200 billion for this purpose.

33. Investment of funds raised through loans to meet the need for government securities should be guided by the principles set out in the Preventive Government Support to Credit Institutions Act (2015:1017).

Management of funds etc.

34. The Debt Office shall place its funds, to the extent that they are not needed for disbursement, in an account at the Riksbank, a bank or a credit market company, or in government securities or other debt instruments with a low credit risk. Investments may be made abroad and in foreign currency. *Ordinance Containing Instructions for the National Debt Office*.

35. The Debt Office shall cover the deficits that occur in the government central account. *Ordinance Containing Instructions for the National Debt Office*.

36. The management of exchanges between Swedish and foreign currency (currency exchanges) is to be predictable and transparent. *Ordinance Containing Instructions for the National Debt Office*.

Consultation and collaboration

37. The Debt Office shall consult with the Riksbank on matters concerning the components of its borrowing operations that can be considered of significant importance to monetary policy. *Ordinance Containing Instructions for the National Debt Office*.

38. The Debt Office shall collaborate with the National Institute of Economic Research and the National Financial Management Authority on matters concerning the Debt Office's forecasts of the central government borrowing requirement. *Ordinance Containing Instructions for the National Debt Office*.

39. The Debt Office should obtain the Riksbank's views on how the funds borrowed to meet the need for government securities under the Budget Act are to be invested.

Evaluation

40. Evaluation of the management of the central government debt is to be carried out in qualitative terms based on the knowledge and information available at the time of the decision. Where possible, the evaluation is to also include quantitative measures. The evaluation is to cover five-year periods.

41. The evaluation of the operational management is to include borrowing in and management of the different types of debt, market support and debt maintenance measures, and management of currency exchanges.

42. For inflation-linked borrowing, the realised cost difference between inflation-linked and nominal borrowing is to be reported.

43. For retail-market borrowing, the cost savings compared with alternative borrowing is to be reported.

44. Gains and losses are to be recorded continuously for holdings within a position-taking mandate and evaluated in terms of market values.

Basic premises of the guidelines proposal

As a result of the economic impact of the coronavirus, and government support measures, the central government debt is expected to increase substantially in 2020 and 2021. Because the increase is assessed to be temporary, however, there are no proposed changes to the guidelines. The changes made to the guidelines in recent years have led to a more comprehensive approach to guiding the debt management, which now provides flexibility in both meeting a rapidly growing borrowing requirement and increased uncertainty.

The objective of the debt management is to, in accordance with the Budget Act, minimise the cost over the long term while taking risk into account. A long-term perspective requires guidelines that are designed to achieve the lowest possible cost of the debt as a whole over time, as opposed to during certain periods or for individual issues or instruments. The guidelines are therefore established on the basis of structural circumstances that have a systematic effect on the cost of the central government debt or the risks in its management.

One of the reasons a long-term perspective is important is that the central government is a major participant in the domestic fixed income market, which means that borrowing requirements and strategies affect the pricing of government securities. This places other demands on the debt management than would be the case for a smaller participant whose actions do not have an effect on pricing.

An essential factor to consider in developing the guidelines is how the debt portfolio is to be structured by maturity and composition of the different types of debt, but there are also other factors affecting the potential for keeping the borrowing cost low over the long term. Those include safeguarding a well-functioning government securities market and maintaining confidence in the Swedish state as an issuer.

The risk stated in the objective refers primarily to the degree to which the cost of the debt is expected to vary. The significance of this risk depends on the size of the central government debt. If the debt is large, high cost variation can lead to major fluctuations in central government finances, whereas a small debt carries a lower risk of impact from variation in cost. Although the central government debt is now expected to increase, it is from a low level and the cost will still form a small part of the central government budget, mainly because interest rates are very low. Cost variation is therefore less significant than it has been historically, such as after the crisis of the 1990s.

There are also other risks that the Debt Office must take into account in the operational management, which become more significant when the debt increases rapidly. These include maintaining a low level of funding risk, i.e. having good preparedness to borrow large amounts at reasonable cost when necessary. Above all, for the central government, an initial position of high creditworthiness and lower debt is what facilitates borrowing large sums without interest rates rising sharply. But it is also important to have access to various lending channels and investors. The central government debt should thus not be so low as to make it difficult to maintain this preparedness.

The Government's guidelines limit the central government debt's exposure to different risks, but they do not govern how the actual funding is to be conducted. Therefore, the Debt Office can borrow in the debt instruments and maturities that best suit the conditions and then use derivative instruments to keep the risks low within the parameters of the guidelines. This flexibility is especially important in a situation such as the present one in which the Debt Office needs to conduct borrowing in all debt instruments in order to meet the growing borrowing requirement. The changes made to the guidelines in recent years towards steering the debt at a more general, overarching level have also helped increase flexibility. These have given the Debt Office greater opportunities to adapt the borrowing to demand and thereby keep the borrowing costs low.

The central government debt is rapidly increasing as a result of the coronavirus pandemic

The coronavirus pandemic that affected Sweden and the rest of the world in spring 2020 has had a significant impact on the economy. Extensive measures have been taken around the world to curb the spread of infection, and these have led to large drops in output and demand. To limit the damage from the virus, the Riksdag, the Government and authorities in Sweden have taken decisions on a number of measures to both reduce contagion and mitigate the financial impact on businesses and private individuals. These include aid to regions and municipalities, lowering costs for, and providing liquidity support to, affected companies as well as revised rules for sickness and unemployment insurance.

In addition to the direct fiscal effects of the decisions taken, central government finances are also affected by expenditure and reduced income through what are called automatic stabilisers. When the economy is poor, taxes paid in by households and companies decrease. At the same time, expenditures such as those for various labour-market-policy support measures increase.

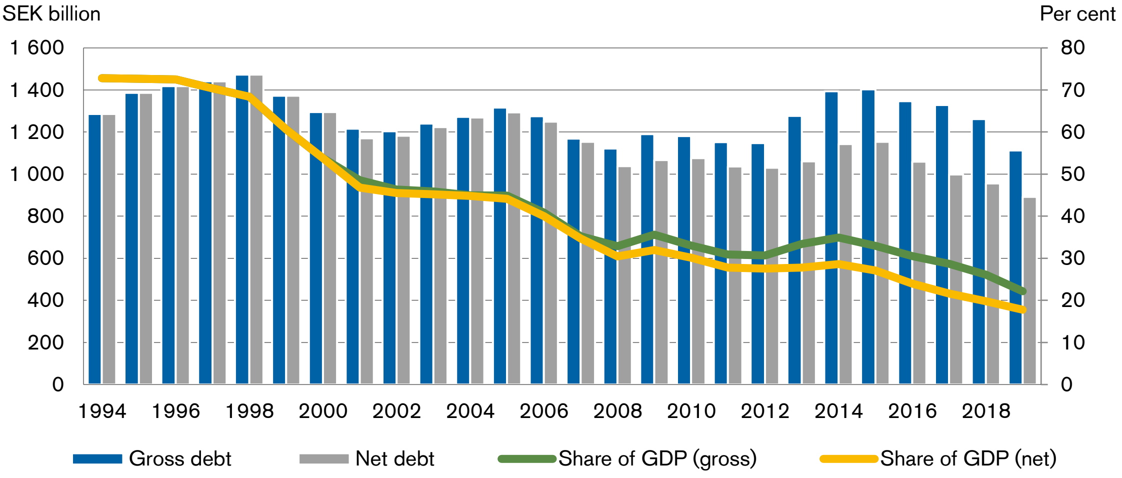
Altogether, the coronavirus pandemic leads to a significantly increased borrowing requirement for the central government, even though it is difficult to estimate an exact number. The central government debt is therefore expected to increase in the next few years from the current historically low level of approximately 25 per cent of GDP. The low level of indebtedness at the outset, however, means that preconditions are good for raising a relatively large amount of debt if necessary.

The trend of declining debt nonetheless continues in the long term

The central government debt as a share of GDP has declined since the mid-1990s. The current level is low, both from an international and historical perspective. Figure 1 shows the debt in kronor and as a share of GDP, gross and net respectively. As shown in the figure, net debt has also decreased in absolute terms. Gross debt is the official measure comprising the sum of all outstanding loans. Net debt is derived by deducting the assets in the management. These assets mainly consist of claims on the Riksbank as well as short-term investments as part of liquidity management.

Both measures are relevant for central government debt management, although in different ways. The net debt is that which is used in the guidelines because its composition determines how high the cost will be and how much it will vary. But the gross debt shows how much the Debt Office has issued in total and provides a better indication of the potential for maintaining a presence in different markets. On-lending to the Riksbank has enabled the Debt Office to borrow relatively large amounts in foreign currency and thereby be able to maintain its presence in the international capital market, without this being at the expense of government securities issuance in kronor.

Figure 1. Development of the central government debt

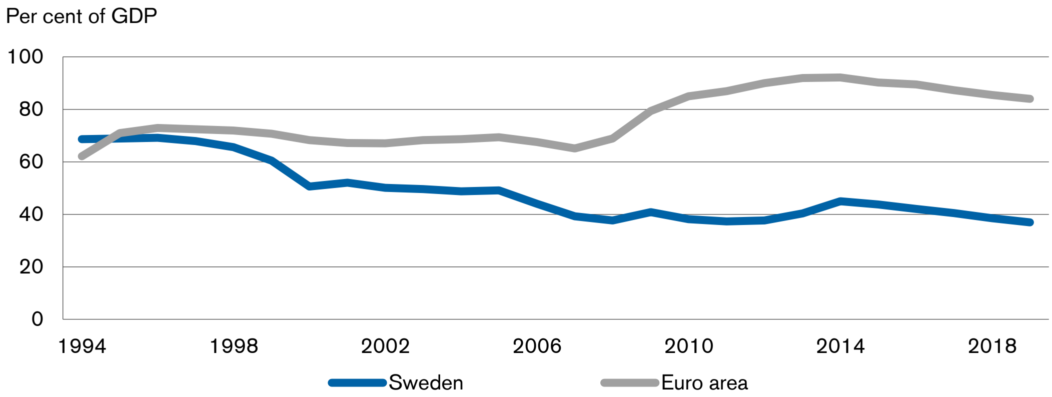


Note: Gross debt (official measure) and net debt after deduction of assets (exposure measure in the guidelines)

Source: The Debt Office and Statistics Sweden

In light of the fiscal policy framework, the starting point should be that the trend of a decreasing central government debt is continuing despite the temporary increase due to the coronavirus pandemic. The Riksdag has established that general government net lending is to amount to one-third of GDP over a business cycle. The surplus target is also supported by an anchor for the consolidated general government gross debt (Maastricht debt) of 35 per cent of GDP. In addition to central government debt, this measure includes local governments (municipalities), regions, and the national pension scheme. If the Maastricht debt deviates from the debt anchor by more than 5 per cent of GDP, the Government is to report to the Riksdag on why the deviation occurred and how it is to be dealt with.

Figure 2. An international comparison of Sweden's general government debt (Maastricht measure)



Source: IMF

The Debt Office expects a temporary increase in the Maastricht debt of around 45 per cent of GDP due the pandemic but that the decrease will then resume and the debt will again reach 35 per cent of GDP within 5–10 years, i.e. in line with the debt anchor. If the debt in the rest of the public sector remains at around the current proportion, this would entail a central government (gross) debt of around 25 per cent of GDP, or approximately SEK 1,200 billion at current monetary value. If the on-lending of around SEK 200 billion to the Riksbank remains at the current level, the net debt would amount to SEK 1,000 billion. This is a small central government debt both in historical terms and compared with other countries (see Figure 2).

If the central government debt is small and the borrowing requirement low, the risk from cost variation is less significant than if the debt corresponds to a large share of GDP. Then it is instead more important to focus on maintaining lending channels that can be used for a time when the borrowing increases again.

A rapid increase in the debt can temporarily make steering more difficult

As established above, there is great uncertainty about how the debt will develop in the next few years. The Debt Office plans to meet the increased borrowing requirement mainly by ratcheting up the short-term borrowing. The issuance volume of government bonds is also being increased and can be supplemented with bond borrowing in foreign currency, which in that case are hedged.

The unexpected and rapid increase in the net borrowing requirement to where it is now may affect the steering of the debt. The high proportion of short-term borrowing means that the term to maturity of the central government debt is shortened. The Debt Office's assessment is, however, that it will be possible to manage the term to maturity within the framework of the existing guidelines, owing to the changes implemented in recent years that have created greater scope for flexibility. The guidelines currently steer the term to maturity of the central government debt as a whole, and previous specific target values have been replaced by intervals.

The share of inflation-linked debt also goes down when borrowing in nominal instruments increases, and it is expected fall below the target value. It is assessed that the market for inflation-linked bonds is not able to accommodate a rapid increase in the issuance volume because the depth and the liquidity are worse in that market. Within a few years, the debt is expected to go down again and if the stock of inflation-link bonds has grown large by then, the share may instead become too high. Because the share of inflation-linked debt is difficult to steer in the short term, the target value in the guidelines is also formulated from a long-term perspective.

Strained liquidity in the government bond market

Liquidity in government securities markets, in Sweden as well as internationally, has deteriorated gradually since the global financial crisis of around ten years ago. Liquidity refers here to the possibility of buying or selling large volumes quickly without affecting market price. When conditions for trading in government securities worsen, the liquidity premium can increase. This means that investors demand a higher return to buy a government security as compensation for the worse liquidity. There is also a risk that investors will abandon the market altogether in favour of other investment alternatives. Investors who have chosen to leave may demand higher returns to re-enter the market.

The regulations implemented after the financial crisis – mainly higher capital requirements and requirements on liquidity buffers – are probably the most important cause of the deterioration in conditions. The regulations have made it more difficult and more expensive for primary dealers of government securities to maintain their inventory and quote prices. Another important explanation is that there has been a central government budget surplus for a number of years, which has meant that the supply of government securities has been small at the same time as the Riksbank has purchased an increasing large share of the outstanding stock. The Debt Office has worked in various ways to mitigate the negative effects described above. The issuance of government bonds has been given priority over other borrowing in order to preserve liquidity in the market. Government bonds are considered the most important channel for the central government in being able to ensure low costs over the long term. The issuance volume in the auctions has more often been divided among two different bonds in order to replenish in maturities when there is a shortage. The Debt Office has also reviewed and supplemented the facilities for market maintenance.

Now the borrowing requirement is expected to increase temporarily, but drastically, as a result of the coronavirus pandemic. Despite the supply having increased relatively quickly, the market for government bonds has so far functioned well. There is great demand for Swedish government securities and the auctions have been oversubscribed. Even if the Riksbank continues with its asset purchases, the net supply is still expected to increase in periods ahead, which will hopefully contribute to improving liquidity in the government bond market.

From a longer-term perspective, however, the problem remains and market liquidity will continue to be a factor to take into account in the debt management. The regulations will also remain in place and as a result of the surplus target, the supply of central government securities with remain limited in the long term.

Review of size of the foreign currency debt continues

Just prior to the guidelines for 2015, the Debt Office conducted an analysis that led to the foreign currency exposure of the central government debt being gradually reduced. The conclusion of the analysis was that no systematic cost advantage could be identified from the exposure in foreign currency at the same time as the cost variation was considerably higher for the foreign currency debt than it was for the krona debt. Accordingly, there were no grounds for retaining the currency risks without any cost savings to be had. The financial market developments in recent years have then raised the question of whether the conditions of that analysis may be viewed differently. Therefore, the Debt Office last year proposed that a new review of the foreign currency exposure of the central government debt be conducted and that the exposure be kept unchanged pending the new analysis. In light of this, the Debt Office has conducted the following two projects in the 2021 guidelines work in order to resolve the issue of what the exposure should be:

- An updated and augmented analysis of the foreign currency exposure based on historical data.
- A forward-looking analysis of whether the historical relationships can be presumed to apply in the future or if conditions are different.

Results of the first project are reported in this guidelines proposal. The second project is still underway and its results will be reported in the 2022 guidelines proposal.

Foreign currency debt remains unchanged for now

It is proposed that the target value for the foreign currency exposure remain unchanged until the work of the ongoing review is completed. However, a clarification of the wording regarding the size of the foreign currency debt is proposed.

As part of the review of the foreign currency exposure of the central government debt, the Debt Office has updated and augmented the previous analysis using historical data. The results of this analysis confirm the conclusions presented in the 2015 guidelines proposal, which formed the basis for subsequently reducing the exposure. In order to investigate whether the historical development can be presumed to be representative in future periods as well, the Debt Office has also initiated work on a further analysis. The results of that analysis will be presented first in the guidelines proposal for 2022. Pending those results, the Debt Office proposes that the foreign currency exposure of the debt remain unchanged.

The target value for the foreign currency exposure reflects the long-term level that the Debt Office plans to reach over time. Keeping the foreign currency exposure of the debt unchanged therefore does not mean that the exposure may not vary at around the desired level as a result of the Debt Office's operational management. In order to clarify this, a revision is proposed to the wording of the guideline for the foreign currency debt.

Clarification of the guideline for the foreign currency debt

The Debt Office must manage changes in the foreign currency exposure that arise on a continual basis. These entail, among other things, interest payments on foreign currency loans, coordination of payments for EU-payment transactions, other agencies' foreign currency hedges and the central government's multi-currency cash pool. The net deviation from the targeted exposure that arises is reconciled through currency exchange transactions in order to restore the central government's foreign currency exposure to its long-term level. In the interest of the predictability of the Debt Office's foreign currency operations, the transactions are spread out over time instead of being made immediately when the deviation occurs. This in turn means that the foreign currency debt varies over the short term even as the long-term level remains unchanged.

To clarify the statement that the foreign currency exposure is to be unchanged, an amendment has been added to point 12 in the guidelines:

Present wording:	Proposed wording:
The foreign currency exposure of the central government debt is to be unchanged. The exposure is to be calculated in a way that excludes changes in the krona exchange rate.	The foreign currency exposure of the central government debt is to be unchanged. The exposure is to be calculated in a way that excludes changes in the krona exchange rate. *The foreign currency exposure may, however,*

vary as a result of the Debt Office making currency exchanges in accordance with point 36.

Historical data in favour of reduced foreign currency exposure

The analysis of the foreign currency exposure presented in the proposed guidelines for 2013, 2014 and 2015 was initiated on the basis of a review of risk expressed as cost variation and of expected cost savings. While it can be said that the risk aspect has been clarified, there has been uncertainty regarding the expected savings potential. The new review therefore focuses on analysing the savings potential of the foreign currency exposure, because it is a prerequisite for being able to discuss a long-term level for the foreign currency exposure of the central government debt.

A strategic decision regarding the foreign currency exposure will not affect the Debt Office's opportunities to issue loans in foreign currency because the foreign currency exposure is managed with the help of derivatives. The analysis is therefore based on market quotes for exchange rates on spot and forward transactions.[1] The savings potential of the foreign currency exposure depends on the result of the transactions required to convert debt in Swedish kronor to foreign currency debt with an equivalent maturity. The choice between exposure in kronor and in foreign currency thus has no effect on the total term to maturity of the central government debt.

The analysis is based on monthly observations between 1993 and 2019.[2] The cost advantage in per cent for an individual month is described by the following equation:

$$\text{Cost advantage}_{t,t+1}^{k} = \frac{F_t^k - S_{t+1}^k}{F_t^k} = \underbrace{\underbrace{\frac{i_t - i_t^k}{1+i_t}}_{\text{interest rate differential}} - \underbrace{\frac{z_t^k}{1+i_t}}_{\text{CCS spread}}}_{\text{Carry}} + \underbrace{\frac{S_t^k - S_{t+1}^k}{F_t^k}}_{\substack{\text{Change in}\\ \text{the exchange rate}}}$$

where S_{t+1}^k is the spot exchange rate at the end of the month, F_t^k is the forward exchange rate at the beginning of the month and k refers to a specific foreign currency. Both spot and forward exchange rates are stated as price in SEK for a unit of foreign currency. The cost advantage can be described in three parts: The first part is the interest rate differential in where i_t represents the Swedish interest rate and i_t^k the foreign interest rate. The second part, which is represented by a cross currency swap (CCS) spread z_t^k, is an additional term added to the foreign interest rate so that the covered interest rate parity holds.[3] The third part stems from exchange rate fluctuations where the spot exchange rate change during the month is put in relation to the forward exchange rate.

A cost advantage can arise when the uncovered interest rate parity is not met. This is the case when that which is usually called carry, which is the interest rate differential plus the CCS spread, is not fully offset by the currency fluctuation. For there to be preconditions for such a savings potential, the

[1] The foreign exchange market is deep and liquid and the Debt Office's actions are therefore not considered to affect price formation as long as net exposure to foreign currencies is relatively constant over time.

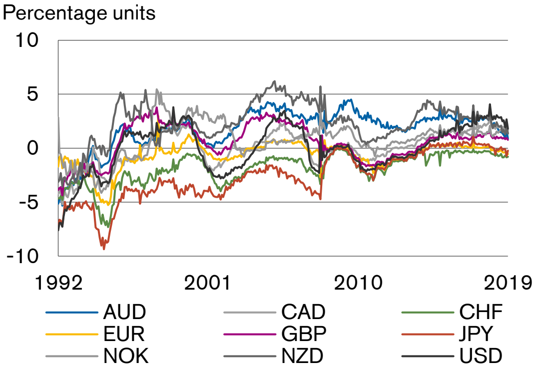
[2] Prior to the introduction of the euro in 1999, Deutsche mark is used as a proxy.

[3] The covered interest rate parity is represented by $1 + i_t^k + z_t^k = \frac{S_t^k}{F_t^k}(1 + i_t)$

implicit foreign short-term interest rate, which is determined by $i_t^k + z_t^k$, must be lower than the Swedish short-term interest rate.

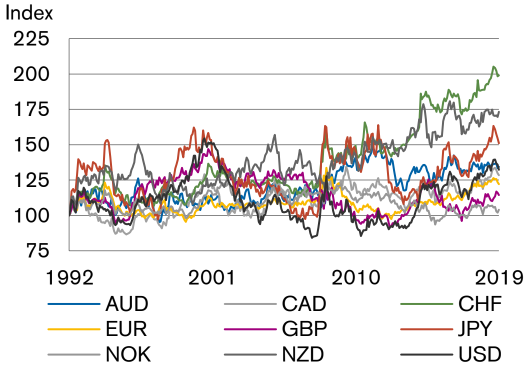
Figure 3 shows that previously there were significant differences in interest rate levels for several currencies but that both the magnitude and number of currencies with lower interest rate levels have decreased since 2013. Figure 4 indicates that currency fluctuations are volatile, which can lead to there temporarily being both large cost advantages and disadvantages. Trend-wise, however, all G10 currencies appreciated against the Swedish krona between 1992 and 2019. The interest rate differential must therefore be sufficiently large in order to compensate for the effect of a depreciation of the krona.

Figure 3. Interest rate difference in relation to Stibor



Note: The difference between implicit foreign one-month interest rates and one-month's Stibor.

Figure 4. Development of the Swedish krona exchange rate



Source: Macrobond

Note: Nominal spot rate indexed as at 31 Dec 1992.

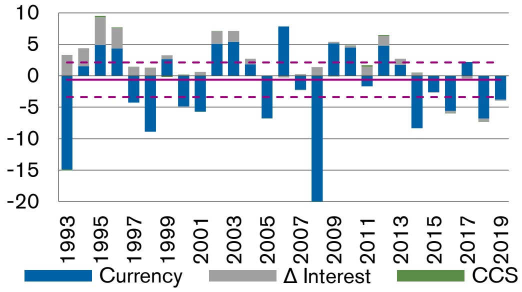
No systematic cost advantage of fixed currency composition

The analysis indicates that the foreign currency exposure does not systematically create savings, neither for individual foreign currencies nor for a portfolio of currencies.[4] As shown in Table 1, only the Japanese yen (JPY) has a positive average annual cost advantage at all. However, the variation is so high that no certain conclusions can be made about either the magnitude or even the sign for the annual cost advantage based on historical data. A 95 per cent confidence interval includes both positive and negative values for all currencies except the New Zealand dollar (NZD), for which the cost advantage is significantly negative.

[4] The portfolio corresponds to the foreign currency target value from 2009, which is the last that was established before the decision was made to reduce the exposure.

Figure 5. Savings with fixed composition

Percentage units



Note: The portfolio consists of 45% EUR, 20% CHF, 15% JPY, 10% USD, 5% CAD and 5% GBP.

The light purple continuous line shows the average cost advantage and the light purple dotted line corresponds to a 95% confidence interval for the average cost advantage based on annual observations.

Table 1. Historical cost advantage

Currency	Advantage	Conf. interval	Stdev
JPY	0.2%	(-5.5% ; 5.8%)	14.2%
EUR	-0.3%	(-2.8% ; 2.2%)	6.3%
Portfolio	-0.6%	(-3.4% ; 2.1%)	7.0%
CHF	-1.0%	(-4.4% ; 2.3%)	8.4%
NOK	-1.2%	(-4.0% ; 1.6%)	7.1%
CAD	-1.4%	(-5.5% ; 2.6%)	10.2%
GBP	-1.5%	(-4.7% ; 1.7%)	8.2%
USD	-1.6%	(-6.4% ; 3.2%)	12.2%
AUD	-3.3%	(-7.0% ; 0.3%)	9.2%
NZD	-4.9%	(-8.3% ; -1.6%)	8.5%

Note: The portfolio consists of 45% EUR, 20% CHF, 15% JPY, 10% USD, 5% CAD and 5% GBP.

Advantage: average annual cost advantage
Conf. interval: 95% confidence interval for the average cost advantage based on annual observations
Stdev = Standard deviation in annual cost advantage

Figure 5 shows how the different subcomponents contribute to the cost advantage during individual years for a portfolio of foreign currencies. The figure is also representative of individual low-interest rate currencies such as the yen (JPY), Swiss franc (CHF) and euro (EUR). The interest rate differential (grey bars) has had a positive contribution up to and including 2013, but at the same time the currency fluctuations have been volatile and of a large magnitude (blue bars). It is not possible to observe a trend of systematic appreciation of the Swedish krona at the same time as the interest rate differential seems to have lost its potential for contributing positively. Therefore, it is difficult to see a structural cost advantage of a foreign currency exposure based on a specific fixed currency composition. To determine if savings can be achieved by utilising the variation in both the interest rate differential and the foreign currency development, the Debt Office has also analysed portfolios with a dynamic currency composition

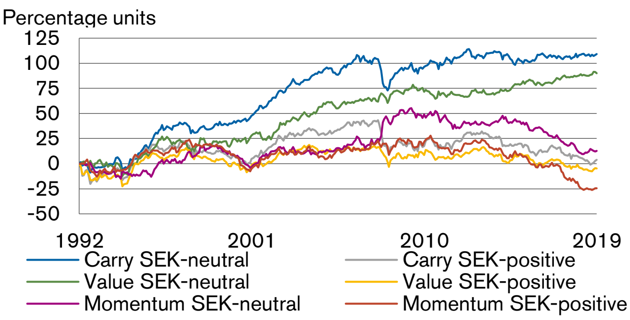
Dynamic currency composition offers same conclusion

Carry, value and momentum are three types of strategies whereby the composition is adapted dynamically to the existing market conditions. Carry is based on a composition that maximises the interest rate differential in the hope that currency fluctuations do not completely negate the positive contribution from the interest rate margin. Value is instead based on a positive exposure in currencies that are considered undervalued and a negative exposure in currencies considered overvalued in order to be able to benefit from a potential future exchange rate adjustment. In a momentum strategy, the composition is based on the assumption that currency fluctuations have a tendency to follow trends.

The strategies are implemented in two different ways. The first of these has equally large positive and negative weights in foreign currencies so that there is no net exposure against the Swedish krona initially. The strategies implemented in this way are therefore designated SEK neutral. In the second option, the positive exposure is limited to only Swedish kronor while the negative weights are the same as in the first case. This alternative is called SEK positive and represents the way in which the strategy would be implemented to achieve a foreign currency exposure in the central government debt. Consequently, the first alternative is not relevant for the analysis of the size of the foreign currency exposure but functions as a reference because it represents how this type of strategies are usually implemented in the foreign exchange market.

Figure 6 shows the accumulated cost advantage for the dynamic strategies and indicates that SEK-neutral strategies have performed better than SEK-positive ones. Additionally, the cost advantages of SEK-neutral strategies have been shown to be more independent of each other than those of SEK-positive ones.[5] All SEK-positive strategies have also had a high correlation (between 0.93 and 0.69) with the portfolio presented in Figure 5. The results show that the value of the Swedish krona is a critical factor for SEK-positive strategies. The historical cost advantage of these is in line with a portfolio with a static currency composition (see the result in Table 2). The choice of dynamic or fixed currency composition is thus inconsequential to the conclusion that currency exposure has not provided any systematic cost savings.

Figure 6. Results, dynamic composition



Note: Accumulated cost advantage of strategies with dynamic currency composition

Table 2. Historical cost advantage

Strategy	Advantage	Conf. interval	Stdev
Carry SEK-neutral	0.2%	(-5.5% ; 5.8%)	14.2%
Value SEK-neutral	-0.3%	(-2.8% ; 2.2%)	6.3%
Momentum SEK-neutral	-0.6%	(-3.4% ; 2.1%)	7.0%
Carry SEK-positive	-1.0%	(-4.4% ; 2.3%)	8.4%
Value SEK-positive	-1.2%	(-4.0% ; 1.6%)	7.1%
Momentum SEK-positive	-1.4%	(-5.5% ; 2.6%)	10.2%

Note:
Advantage: average annual cost advantage
Conf. interval: 95% confidence interval for annual savings
Stdev = Standard deviation in annual cost advantage

The results above confirm the previous analysis that formed the basis for the foreign currency debt being reduced between 2015 and 2019. The analysis in the proposed guidelines for 2013 showed that the foreign currency exposure unequivocally leads to an increase in cost variation. At the same time, if the foreign currency debt does not lead to savings, it can be concluded that there is no justification for any foreign currency exposure in the central government debt's long-term composition.

Based on the result of an backward-looking analysis, the conclusion is that the foreign currency exposure should continue to be reduced. The issue is then whether the history can also be assumed to be representative of the future. In certain time periods, the foreign currency exposure can create both major advantages and disadvantages for the cost of the central government debt depending on whether the Swedish krona is strengthened or weakened during the period. However, such effects can be taken advantage of in the position taking. The most extensive example of this occurred after the financial crisis, with the total realised gain reaching SEK 8.1 billion.

[5] The correlation of cost advantage measured on a monthly basis between SEK-neutral carry and value is only 0.23 compared with 0.83 for SEK-positive carry and value.

Further analysis remains

As is evident by this point in the report, there are several aspects of central government debt management that include using currency as a means for reducing costs in the management, for example within position taking and foreign currency exposure. However, these different aspects have distinctly different characteristics and they should ideally be described in consistent terms including how they relate to each other.

The Swedish National Debt Office is the central government financial manager and the national resolution and deposit insurance authority. The Debt Office thereby plays an important role in the Swedish economy and the financial market.

RIKSGÄLDEN
SWEDISH NATIONAL DEBT OFFICE

Visiting address: Olof Palmes gata 17 | Postal address: SE-103 74 Stockholm, Sweden | Phone: +46 8 613 45 00 E-mail: riksgalden@riksgalden.se | Web: riksgalden.se