Memorandum

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DEPARTMENT: Financial Stability Department/ Asset Management Department

SVERIGES RIKSBANK
SE-103 37 Stockholm
(Brunkebergstorg 11)

Tel +46 8 787 00 00
Fax +46 8 21 05 31
registratorn@riksbank.se
www.riksbank.se

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Annex A: The Riksbank's need of foreign exchange reserves

Summary

Access to foreign currencies plays a major role in the Riksbank's ability to safeguard the stability of the financial system by having the capacity to supply liquidity in foreign currencies in the event of a crisis.

At present the Swedish financial system is stable. The major Swedish banks are well capitalised in an international comparison and have only minor exposures to the euro area countries with sovereign debt problems. The banks' earnings capacity is good and their loan losses are small. These factors have contributed to boosting market confidence and to the banks thus having good access to wholesale funding. However, the Riksbank has noted earlier that there are increased risks linked to developments abroad.[1] There is still a possibility that negative developments abroad could subject the Swedish financial system to stress.[2] The role of the Riksbank in this type of situation is, if necessary, to provide emergency liquidity assistance in both Swedish and foreign currency. In addition, the Riksbank is facing increased commitments towards the International Monetary Fund (IMF). If part of the foreign exchange reserve is used to meet these commitments, the Riksbank's capacity to provide liquidity assistance will be reduced.

Given this, the Riksbank has calculated what it needs to hold in the foreign exchange reserve. The results show that there is reason to reinforce the foreign exchange reserve by SEK 100 billion to have a good margin for managing an improbable, but not impossible, scenario where the Riksbank need to supply the banking system in Sweden with liquidity in foreign currencies on a large scale, at the same time as a larger share of the Riksbank's IMF commitments is put into use.

Why does the Riksbank need a foreign currency reserve?

There are three main reasons why the Riksbank needs assets in foreign currencies:

[1] See *Financial Stability Report 2012:2*, Sveriges Riksbank and *Monetary Policy Report, October 2012*, Sveriges Riksbank.
[2] See *Financial Stability Report 2012:2*, Sveriges Riksbank pp. 69 onwards.

1. To be able to intervene in the foreign exchange market where necessary for monetary and foreign exchange policy reasons.

2. To maintain readiness to provide the financial system with liquidity in another currency than the Swedish krona. This is based on financial institutions having assets and liabilities in foreign currencies. The difference in maturity between these assets and liabilities entails a liquidity risk in foreign currency. The capacity to provide liquidity assistance is one of the Riksbank's fundamental tasks in its role of safeguarding a stable and efficient financial system. The Riksbank's capacity to provide liquidity assistance is also an important condition for being able to maintain price stability, as an efficient financial system is necessary for effective monetary policy.

3. To fulfil international commitments towards, for instance, the IMF, the European Central Bank (ECB) and other central banks. The Riksbank has commitments towards the IMF that function as credit facilities that the IMF can use when needed. If the foreign exchange reserve is used for this purpose, the Riksbank's capacity to provide liquidity assistance is reduced accordingly. On 31 July 2012, the Riksbank's total commitments to the IMF amounted to SEK 116 billion. The IMF has currently made use of SEK 11 billion of these commitments. In addition to the current commitments, the Riksdag (the Swedish parliament) gave its consent on 22 November 2012 to the Riksbank signing an agreement on credit that allows the IMF to borrow a further SEK 70 billion from the Riksbank.

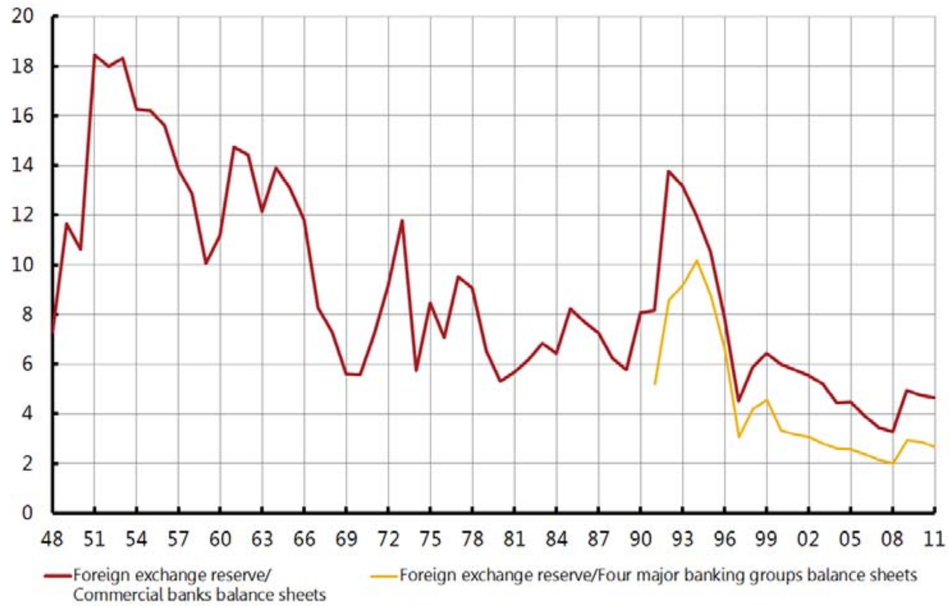
The major Swedish banks have since the 1970s increasingly funded their lending through wholesale funding, and during the 2000s wholesale funding in foreign currencies has grown particularly rapidly. This development reflects the Riksbank's need to hold foreign currency itself to be able to quickly contribute liquidity to the banking system in stressed situations and thereby safeguard financial stability and the functioning of the financial markets. This became particularly clear during the financial crisis 2008-2009, when the Riksbank lent US dollars to a value corresponding to SEK 240 billion to financial institutions. In addition to the Riksbank's lending, the Swedish National Debt Office (SNDO) guaranteed certain individual institutions' issues in foreign currencies. At most, the public sector's – the Riksbank's and the SNDO's – commitments in foreign currencies amounted to more than SEK 450 billion. With regard to the Swedish krona, there are no operational limits as to how much liquidity assistance the Riksbank can provide. However, there is no corresponding capacity to create liquidity in foreign currencies. The Riksbank's capacity to provide liquidity assistance in foreign currencies is limited by the Riksbank's own access to the currency concerned and by how quickly the currency can be acquired. In the event of an acute crisis, where liquidity assistance must be provided immediately, the Riksbank must have immediate access to sufficient foreign currency, for instance, in the form of very liquid and unutilised assets on its own balance sheet or – provided that this can be done quickly – by borrowing funds through existing agreements with external institutions (e.g. the SNDO, the Bank of International Settlements (BIS), the ECB or other central banks).

Deliberations regarding the size of the foreign currency reserve

From an historical perspective, the Riksbank's foreign exchange reserve has declined; both as a share of the banking system's balance sheet total and as a share of the banks' funding from abroad (see Figure 1 and Figure 2). Aggregate time series of this form are measured roughly, however, and cannot replace a more detailed analysis of the Riksbank's need for foreign exchange reserves. For example, some of the banks' increased borrowing abroad in recent years has been used to build up liquidity buffers, which reduces the banks' liquidity risks. Nevertheless, this fact does not refute the overall conclusion that the banks' liquidity risks in foreign currencies have been growing at a faster pace than the foreign exchange reserve for a long period of time.

Figure 1. The foreign exchange reserve as a percentage of the banks' balance sheets

Per cent

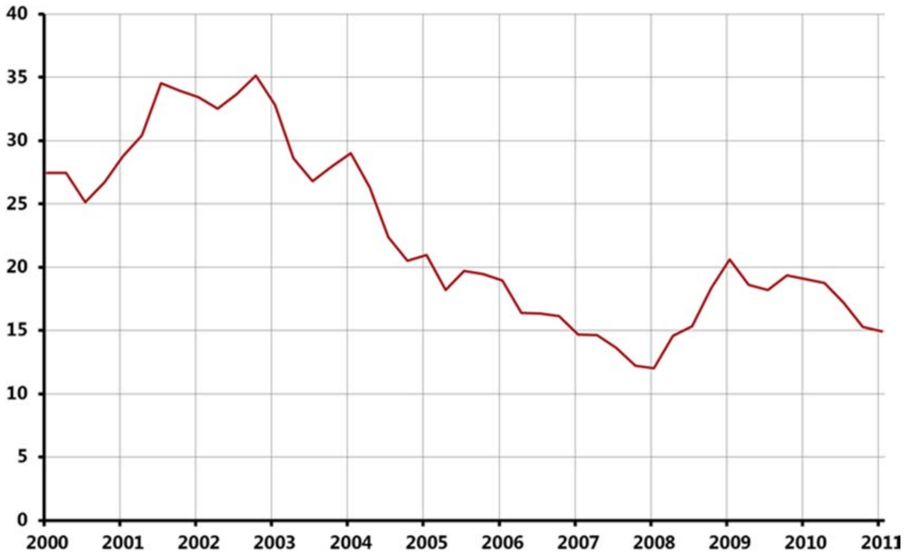


Note. Commercial banks refers to Swedish banks' domestic activities including foreign branches, while the four major bank groups only refers to Nordea, Swedbank, Handelsbanken and SEB, but includes their foreign subsidiaries.

Sources: Statistics Sweden, the banks' reports and the IMF

Figure 2. The foreign exchange reserve as a percentage of wholesale funding in foreign currencies

Per cent



Note. The figure refers to Swedish monetary financial institutions (MFI) and therefore does not include the Swedish banks' foreign subsidiaries. The part of the foreign wholesale funding that is assumed to be converted to Swedish krona via the foreign exchange swap market is excluded.

Sources: Statistics Sweden and the IMF

Overall considerations

It is difficult to calculate a suitable size for the foreign exchange reserve. One reason is that there have only been a few examples where the banking systems in developed economies have suffered such large currency outflows that the public sector has been forced to take over the private sector's commitments on a large scale. Most calculations are therefore based on assumptions that are difficult to prove empirically. But even if a decision-maker had full information on the probability of certain outflows occurring, there would nevertheless be no objectively correct answer to the question of an appropriate size for the foreign exchange reserve. This is because a foreign exchange reserve functions as an insurance against the economic consequences that ensue if the banking system suffers liquidity problems in foreign currencies. The view of what is a suitable size for the foreign exchange reserve thus depends on how negative a scenario the foreign exchange reserve is intended to insure against (i.e. the decision-makers' risk aversion), on the assessments of the probability of such a scenario occurring and on how great the economic consequences are estimated to be in this scenario.[3] Given the current crisis in the euro area, both the probability and consequences of a negative scenario ought now to be greater than normal. This justifies a larger foreign exchange reserve than would otherwise be the case.

[3] Expressed another way: "The optimal level of reserves [...] is based on various parameter assumptions. These include the size and probability of a sudden stop, potential loss in output and consumption, opportunity cost of holding reserves and the degree of risk aversion". "Assessing Reserve Adequacy", SM/11/31, International Monetary Fund (2011).

[3] 2009 the Riksbank decided to temporarily reinforce the foreign exchange reserve by the equivalent of SEK 100 billion by borrowing EUR and USD from the SNDO.

In addition to these aspects, there are also a number of factors that are partly specific to Sweden which should also be taken into account. All in all, these factors indicate that there should be margins in the foreign exchange reserve with regard to the scenario against which the decision-maker wishes to insure:

- There is probably a lower limit for how large a share of the foreign exchange reserve can be used for liquidity assistance without damaging confidence in the Riksbank's capacity to safeguard financial stability.
- It is not certain that, in a situation where the Riksbank uses its foreign exchange reserve as a general lending facility, the institutions with the greatest need will be able to borrow the money they need. Other institutions that do not really need to borrow may choose to do so to improve their liquidity situation. Similarly, in a crisis situation, foreign banks may use potential lending facilities in foreign currencies offered by the Riksbank.
- There is also a possibility that the number of counterparties allowed to bid in the Riksbank's auctions will be extended in a serious crisis.
- If a serious crisis occurs, it is possible that the Riksbank might need to take measures, in addition to lending to the major banks and the IMF to safeguard financial stability, which would make use of the foreign exchange reserve's resources.[4] Moreover, it is not certain that the public guarantee programmes would reduce the need for foreign exchange reserves "one on one".[5]

A quantitative analysis

Based on the information the major Swedish banks report regarding their Liquidity Coverage Ratios, LCR, the Riksbank has made calculations of the major banks' liquidity requirements in a stressed situation. [6,7] The results of the calculations show that the need for liquidity support in an improbable, but not impossible, base scenario amounts to SEK 336 billion (see Appendix). The scenario assumes that the Riksbank's IMF commitments increase at the same time and that the overall liquidity requirement amounts to SEK 371 billion.

The Riksbank's foreign exchange reserve amounted to SEK 270 billion on 31 July 2012, around SEK 90 billion of which was borrowed through the SNDO. If the gold reserve is included, the foreign exchange reserve amounts to SEK 314 billion.

If the foreign exchange reserve is to manage to supply the banking system with liquidity corresponding to the base scenario, it must be reinforced by at least SEK 57 billion. But if the purpose is to insure with a good margin against such a scenario, an increase of SEK 100 billion in the foreign exchange reserve would mean that it was on the "right" side of the base scenario with a margin of SEK 43 billion.

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[4] In addition to the lending to individual institutions during the crisis 2008-2009, the Riksbank also lent foreign currencies to Iceland's and Latvia's central banks.

[5] For example, the question of "timely payment" is important for securities guaranteed by the government to receive the highest credit rating, that is, how quickly the government can supply foreign currency to an investor that has bought the security.

[6] The reference to the four major banks here concerns consolidated balance sheets for Handelsbanken, Nordea, SEB and Swedbank.

[7] As of July 2011, the major Swedish banks have reported in detail on their liquidity situation in foreign currency and how this might be affected in times of stress to Finansinspektionen (the Swedish Financial Supervisory Authority). These reports form the basis for the banks' calculations of their Liquidity Coverage Ratios. See also http://www.fi.se/Regler/FIs-forfattningar/Forslag-nya-FFFS/Listan/Forslag-till-nya-regler-om-kvantitativt-krav-pa-likviditetstackningsgrad-och-rapportering/

However, the calculations are very uncertain. Firstly, the calculations are based on the outflows the banks may face during a 30-day period only. This relatively short period of time means that the results of the calculations vary from month to month. Secondly, the calculations are based on data that the banks report at individual points in time at the end of each month. This means that the banks' actual liquidity needs could very well be lower or higher than indicated by the results presented.

Methods to increase the size of the foreign exchange reserve

An important consideration is to what extent the foreign exchange reserve should be reinforced as a preventive measure or be reinforced when it needs to be used. A preventive reinforcement of the foreign exchange reserve entails higher costs for the Riksbank, but at the same time has a higher insurance value as it guarantees that the funds are available if the need arises. Events since 2008 have shown that "the impossible" can happen. The markets ceased to function entirely or partly, and this meant that countries and banks that previously had access to important funding markets experienced difficulties in issuing the necessary amounts within the set time. Given this, the Riksbank considers that the foreign exchange reserve should be reinforced as a preventive measure, as this creates the greatest confidence.

There are a number of methods of increasing the size of the foreign exchange reserve. The alternative that is currently preferable is to borrow foreign currencies through the SNDO. Increasing the size of the foreign exchange reserve will entail costs, as the SNDO's borrowing rate can be assumed to be higher than the return the Riksbank will have on the borrowed funds if they are invested highly liquid assets. At a rough estimate, an increase in the foreign exchange reserve of SEK 100 billion entails a cost of SEK 200 million, if the funds are borrowed through the SNDO. It may be appropriate for the Riksbank to investigate further ahead how the borrowing should be funded.

Appendix: The banks’ liquidity needs in foreign currencies under stress

This appendix describes the calculations made by the Riksbank to determine the size of the major banks' liquidity needs under stress. The Riksbank writes in the Financial Stability Report 2012:2 that the major Swedish banks on average can manage the minimum requirement set for the month-long liquidity measure (the Liquidity Coverage Ratio, LCR). However, structural liquidity risk in the banks is high. This is shown, for instance, in the one-year liquidity measure NSFR where the major Swedish banks are on average far from attaining the minimum criteria. This means that the major Swedish banks’ resilience to short-term liquidity problems is good, but that their resilience declines rapidly if the stress is prolonged. The calculations in this appendix are based on the information the banks report with regard to their own LCRs. Capturing a stress that persists longer than one month adds further assumptions to the different scenarios described below. This means that the banks’ actual LCR outcomes (which are referred to in Financial Stability Report 2012:2) and the results reported in this appendix should not be confused with one another.

The LCR measure shows the banks’ capacity to meet the liquidity requirements that arise during one month in a stressed scenario and describe a situation where the banks are unable to refinance the securities that mature and are moreover subjected to bank runs. In addition, their customers make use of credit facilities and some of the banks’ liquid assets also need to be pledged as collateral in financial contracts showing a negative development. However, the banks also have inflows of cash, for instance from loans that are repaid and derivative contracts that mature. The banks’ LCRs are calculated by putting the stressed net cash outflow (outflow minus inflow) in relation to the banks’ most liquid assets (the banks’ liquidity reserves). An LCR of 100 per cent thus means that the bank’s liquid assets fully cover the bank’s stressed liquidity requirement for 30 days.

The LCR is a good starting point for assessing the banks’ liquidity requirements, but describes a specific scenario based on certain assumptions. Other scenarios are also conceivable, for instance, a situation where the stress continues for a longer period of time than one month or where the banks are unable to sell all of the assets in their liquidity reserves. The scenarios below are designed to capture these aspects as well.

The calculations are based on consolidated balance sheets, that is, all foreign subsidiaries are included. To take Nordea as an example, this means that the needs of Nordea in Sweden, Finland, Norway and Denmark are all included in the calculations. The liquid funds that Nordea’s foreign subsidiaries hold have thus already been included in the consolidated figures and cannot be lent to Nordea Sweden as this would imply double counting. The calculations also assume that there is free mobility of liquidity between the different parts of the group (that is, no ring fencing).

They are also adjusted for foreign exchange swaps. Swedish banks borrow foreign currencies for two purposes: 1) to finance assets in foreign currencies, 2) to use foreign exchange swaps to convert foreign funding into Swedish krona to finance assets in Swedish krona. In both cases a bank may find it difficult to obtain refinancing if the capital markets suffer shocks, but it is only in the first case that the bank will suffer a shortage of foreign currency (shocks on the markets can, however, lead to other problems).[8] The calculations on which the banks’ need for foreign currency is based therefore only include the funding in foreign currencies used to

[8] In the event of the bank’s swap counterparty being unable to meet its commitments (what is known as counterparty risk), the borrowing abroad that is swapped for Swedish krona may nevertheless give rise to liquidity risk.

finance foreign assets and not that converted to Swedish krona through foreign exchange swaps. This ensures that the refinancing risk in foreign currency is not overestimated in the calculations.

Scenario description

By changing the assumptions on how much of the liquidity reserves the banks can convert on the market in a stressed situation, one attains an estimate of how the liquidity need varies in different scenarios. Three such scenarios ("min", "base" and "max") are described below. The difference between the scenarios lies in how much of the liquidity reserves the banks are assumed to be able to use in practice to meet outflows of cash. One of the reasons why parts of or all of the liquidity reserve are excluded in the base scenario and the max scenario is that the banks are not expected to turn to the Riksbank directly as soon as the stress occurs. In these two scenarios it is assumed that the banks will initially use parts or all of the reserve that can be converted into liquidity on the market to meet the liquidity outflows. As the Riksbank only becomes involved after a period of time in these cases, the two scenarios thus implicitly take into account the banks' liquidity requirements for a period longer than one month. The major banks' potential outflows decline somewhat after the first month, but the number of securities reaching maturity remains high during the following months. Moreover, it may be difficult to convert some parts of the liquidity portfolio into liquidity on the market, even if they are regarded as very liquid in accounting terms, such as some European countries' government bonds. In addition, the banks may face increased haircuts and margin calls, which also reduces the available liquidity buffer.[9] If the reserves are not sufficient to cover the banks' liquidity needs (net cash outflow), it is assumed that this need will be covered by loans from the Riksbank. The net outflow is the same in all scenarios.

In reality, the probability of any of the scenarios described below occurring is small, and this applies in particular to the more extreme max scenario. However, the scenarios are relevant because the foreign exchange reserve must insure against events that are improbable but not impossible.

Scenario 1 – "min scenario"

- This scenario assumes that the banks have a lower liquidity requirement as they can use all of their most liquid assets to meet a stress that lasts 30 days. It is assumed that other assets cannot be used on the market to create liquidity.
- This scenario can reflect a situation where the Riksbank's commitments to the IMF do not increase to any great extent.
- It is assumed in this scenario that some of the banks have the possibility to issue government-guaranteed securities, which reduces the need for liquidity.
- Only the need for EUR and USD is calculated.

Scenario 2 – "base scenario"

- This scenario assumes that the banks have already used, or are unable to convert half of their most liquid assets. One reason for this could be that they need to pledge parts of their liquid assets as collateral to counterparties as

[9] It was the counterparties' increased demands for collateral in derivative transactions that contributed to the failure of the major Belgian bank Dexia in 2011.

the market conditions are changing, for instance, in repo transactions and derivative contracts.

- The Riksbank's commitments to the IMF are used in this scenario to the equivalent of SEK 35 billion, in addition to what has already been used.
- It is assumed in this scenario that the banks do not have the possibility to issue government-guaranteed securities.
- Only the need for EUR and USD is calculated.

Scenario 3 – "max scenario"

- This scenario assumes that the banks have a higher liquidity requirement as they have already used their most liquid assets on the market, or alternatively are unable to use them on the market for the same reasons as in the base scenario. The scenario is based on the extreme liquidity stress being prolonged.
- It is assumed in the max scenario that the IMF uses all of the Riksbank's outstanding commitments (including the bilateral loans that have not yet been decided by the Riksdag) to a value of SEK 175 billion. The probability of this scenario occurring is very small. To use the entire IMF commitments would require compulsory purchases of SDR on a large scale (which has not taken place since 1986) and that a large number of countries that are currently lenders to the IMF also suffered problems.
- It is assumed in this scenario that the banks do not have the possibility to issue government-guaranteed securities.
- The need for EUR and USD and also the need for other foreign (primarily Nordic) currencies are calculated. Half of the need for the other Nordic currencies is met by other Nordic central banks.

The major banks' total liquidity requirement in the scenarios varies between SEK 123 billion ("min scenario") and SEK 746 billion ("max scenario") depending on the assumption of how large a share of their liquid assets they can use, whether the guarantee programme is available and which currencies are included. In the base scenario, where the banks only use half of their liquid assets and where no bank has the possibility to issue government-guaranteed securities during the stressed period, there is a liquidity need in EUR and USD corresponding to SEK 336 billion. In addition, there are the assumptions of an increased IMF loan use of SEK 35 billion.