



Staff Memo

Does central bank equity matter for monetary policy?

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Staff Memo

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Summary

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The question of whether a central bank's financial results and equity matter for the formulation of monetary policy is not new but has been discussed from time to time. This report summarises some of the literature in this area. Both theoretical arguments and practical experience suggest that neither financial results nor equity limit the scope of monetary policy, at least not in the short term. Central banks, unlike private banks and other commercial activities, are not at risk of bankruptcy and can normally generate the resources they need to meet their obligations.

However, if the central bank is unable to cover its costs and maintain sufficient financial buffers in the longer term, it may find itself in a situation where it needs capital injections from the national budget. This could affect the independence and credibility of monetary policy. A high degree of financial independence is important to maintain confidence in an independent monetary policy that is not subject to political pressures.

A comparison of a few central banks shows that the Riksbank's situation is not unique in terms of the size of the losses in relation to the size of the balance sheet or economy.

Do a central bank's financial results and equity matter for its ability to conduct monetary policy? This is not a new question but one that has been discussed from time to time. However, it has taken on new relevance because several central banks are now making financial losses on their asset holdings as interest rates rise. This report summarises some of the literature in this area.

Both theoretical arguments and practical experience suggest that financial results or equity do not limit the scope of monetary policy, at least not in the short term. In particular, this is based on the fact that central banks, due to their ability to issue money, can generate the resources they need to meet their obligations. We will review the arguments usually put forward to support this conclusion in Section 1. At the same time, there are both economic and political mechanisms that limit independence. For example, a central bank cannot create unlimited amounts of resources because an excessive supply of liquidity affects interest rates and inflation in a way that may be incompatible with the central bank's objectives and mandate. In a small, open economy, the

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central bank's room for manoeuvre and need for buffers are also affected by the level of financial integration with other countries. To maintain sufficient confidence in monetary policy and central bank independence, a certain degree of financial independence needs to be maintained over time. These arguments are presented in Section 2. In Section 3, we present some arguments as to why the level of equity might affect monetary policy; arguments that add nuance to the view presented in Section 1. It is a question both of a weak financial position influencing the central bank's decisions, for example its risk tolerance, and of trust in the central bank being affected. However, how the credibility of the central bank is affected by its financial position also depends on how stable the economic policy regime is perceived to be in other respects, for example regarding fiscal policy.

While the first three sections provide a broad literature review, the fourth section focuses on the more concrete policy issue of whether central banks, given the losses now expected, are sufficiently financially independent. More precisely, it is a question of whether their earning capacity is sufficient to provide a low probability that they will need a capital injection from the national budget. The Riksbank's situation is compared with that of other central banks.²

² More questions about the central bank's need for equity, how earning capacity depends on the composition of the balance sheet and how the Riksbank's situation compares with that of other central banks are addressed in detail by Kjellberg and Vestin (2019), who also provide a literature review. In this Staff Memo, we focus on the issue of the importance of equity for monetary policy.

1 Why monetary policy is not constrained by the central bank's financial results or capital

Central banks do not have a profit motive but instead have other objectives and mandates. Those objectives and mandates are more important than the financial results, and therefore the bank's decisions should ideally not be influenced by the financial position. Neither is this normally the case, since central banks, unlike private banks and other commercial activities, do not have to risk bankruptcy. They can normally generate the resources they need to meet their obligations as they have a monopoly on issuing a "base money", i.e. central bank money for the public (cash) or for the banking system (so-called reserves); see, for example, Buiters (2008).³

Broadly speaking, the central bank's objective can be said to be to contribute to a well-functioning economy that leads to benefits for citizens. This objective has usually been operationalised by legislators as the central bank maintaining price stability, financial stability and a high and stable utilisation of resources, which it does by controlling the supply of "money" to society, i.e. means of payment in the broad sense; the liquidity supply.⁴ This work also involves the central bank taking on financial risks. This may include, for example, interest rate or credit risk in connection with lending to banks, as part of normal monetary policy or in special crisis situations, or currency risk through the holding of foreign exchange reserves. The fact that taking on risk is part of the task of central banks became particularly clear in the context of the 2008 financial crisis (see again Buiters's contribution from 2008). In a recent review published by the central bank of the Netherlands, Wessels and Broeders (2022) stress that central banks have to manage both calculable risks, which the balance sheet is associated with at any given moment, and latent risks, which are associated with drastic measures that may have to be taken in the future.⁵

Making losses may be perfectly compatible with a central bank's remit of ensuring the smooth functioning of the economy. It contributes to a well-functioning economy by maintaining confidence in the financial system and by stabilising inflation and economic activity. The relevant "profit" against which the central bank is to be evaluated is its contribution to the public good in terms of the efficient use of resources. In con-

³ However, this traditional argument is affected by the fact that financial innovations create competing means of payment, which affects the value of the "base money" monopoly. The effects can be expected to be greater for small countries than for larger countries whose currencies are also in demand internationally (such as USD and EUR).

⁴ See Bertsch and Molin (2016), Bindseil (2016) and Wessels and Broeders (2022).

⁵ Their descriptions of the risks are consistent with the structure of the risk reports to the Executive Board of the Riksbank, as an example. Wessels and Broeders argue that the latent risks can be estimated by examining longer historical data (e.g. 50 years back) for several countries, as well as through scenario analyses (stress tests), preferably linked to the central banks' financial stability reports. However, Archer and Moser-Boehm (2013, p. 45, p. 54) argue that developments from the 2008 financial crisis onwards have involved so many highly improbable events that they were hardly possible to capture in stress tests in advance.

trast, a positive financial result is not a target for the central bank and, on the contrary, losses may be a natural consequence of its operations and therefore not a sign that it needs to change.

With its ability to issue money, the central bank has no liquidity problems in the short term.⁶ However, even if the central bank, unlike private commercial activities, cannot go bankrupt, the financial position of the central bank is not completely irrelevant to its ability to carry out its tasks. It should have its own sufficiently large earning capacity to cover its costs in the long term. The central bank should be able to act independently and not have to request funds from the national budget - something that has also been very unusual in a historical and international perspective. Financial independence is created by the central bank's access to funding (balance sheet liability items) that is largely cost-free. It consists not only of banknotes and coins, but also deposits from the banking system at (partly) zero interest, equity and buffers in the form of retained earnings or revaluation accounts.⁷ Normally, the central bank's operations generate a surplus which results in the transfer of funds to the national budget. Although temporary losses may occur, the expected present value of the return on cost-free capital, mainly the surplus from the monopoly of issuing money (so-called seigniorage), is usually greater than the expected financial losses.

However, the objective of stable and low inflation has contributed to lower interest rates and to lower seigniorage for central banks (Klüh and Stella, 2008).⁸ In Sweden, moreover, the amount of banknotes and coins in circulation has declined as cash has been replaced by other means of payment, and this has happened at a quicker pace than in other countries (see, for example, Kjellberg and Vestin, 2019). This raises the question of whether earning capacity will continue to provide sufficient financial independence in the future.

⁶ As Buiter (2008) points out, this concerns the liquidity in the domestic currency. However, a central bank may have problems with a lack of liquidity in foreign currency, for example if it tries to control the exchange rate to a certain value, or if private banks need liquidity support in foreign currency.

⁷ Moreover, a central bank, as part of the state, can be said to have an implicit state guarantee. However, Wessels and Broeders (2022) do not consider that state guarantees provide as effective an independence as equity.

⁸ See also Del Negro and Sims (2015) and Wessels and Broeders (2022) for discussions of how seigniorage depends on the design of monetary policy. The converse may also be true. Too low seigniorage and earning capacity can put pressure on the central bank to pursue policies that lead to higher inflation than desired.

2 Why central bank independence may require a certain level of equity

Although the financial position of the central bank has no immediate impact on its ability to pursue the policies it deems appropriate, its equity and its earning capacity should be high enough over time to ensure that it is sufficiently financially independent. This may mean, for example, that there shall be a low probability of it requiring any funding from the national budget, at least in the near future. In this section we will present arguments for this.

It is generally accepted that central banks should have a high degree of independence, mainly to design monetary policy with the aim of maintaining low and stable inflation.⁹ Experience shows that inflation is lower and more stable in countries and periods where the central bank has a relatively high degree of independence. While there may be many factors behind such a correlation (Klüh and Stella, 2008), one theoretical explanation that has been offered is that a central bank with high independence may reduce the credibility problem (time inconsistency) that economic policy otherwise has and that may lead to undesirably high inflation (Rogoff, 1985).

Wessels and Broeders (2022) specify the implications of the central bank needing to make a profit on average and have a certain amount of capital to be permanently independent and credible:¹⁰

- The central bank needs to be independent, including financially independent, in order to have the credibility to take on necessary risk in financial crises (as lender of last resort, through quantitative easing, etc.)
- The central bank needs income to cover its costs, as well as buffers to absorb losses, in order to be financially independent

Archer and Moser-Boehm (2013) point out that the central bank should have an earning capacity large enough to cover not only its normal running costs, but also for when it needs to act in a crisis. This means that the earning capacity shall be sufficient to cope with a latent risk in the terms of Wessels and Broeders (2022). However, Archer and Moser-Boehm note that it may be difficult to gain acceptance in normal times for the need for sufficient buffers to cover such latent risks.

The central bank always having sufficient financial independence is not a given. One reason is that the central bank's financial position needs to be strengthened over time as the financial system grows and the scope of the central bank's operations and balance sheet grows with it.¹¹ This may mean that financial risks and hence buffers also grow over time. Consequently, a level of equity and other cost-free funding deemed

⁹ See Dincer and Eichengreen (2014), who also show how the degree of independence differs across countries.

¹⁰ See also Kjellberg and Vestin (2019) for similar reasoning and further references to relevant literature.

¹¹ Note that the central bank's balance sheet may need to grow faster than GDP if the financial system is growing faster than GDP.

sufficient in one situation may not be sufficient in another.¹² However, the earning capacity from the amount of banknotes and coins (which contributes to the seigniorage) does not obviously grow over time, but rather may shrink as a result of financial innovations and the undermining of the rule of central bank money as legal tender.¹³ In some countries, but not in Sweden, there are rules requiring banks to have interest-free reserves placed with the central bank, which may contribute to the earning capacity.

It is something of an irony that the safety net created by central banks and other government measures around the financial system can contribute to *greater* risk-taking by financial market participants. This, in turn, can affect both the central bank's need for financial resources and its measures. Bindseil (2016, p. 192) articulates that a lesson from the 2008 financial crisis is that "The design of the OF [operational framework] would ideally be supportive to the banking system's ability to provide maturity and liquidity transformation at the service of society, while not going as far as facilitating *excessive* leverage and moral hazard". However, even with the best possible crisis prevention, financial crises cannot be avoided entirely. Once such crises occur, it may be difficult for the central bank to obtain capital injections in this situation, as the national budget tends to be burdened in other ways at the same time. This is another reason why the central bank needs to have a certain level of equity and a good earning capacity of its own.

In principle, the central bank's equity can also be too high. The return on equity and other buffers, once cost-free funding has reached a certain level, could provide greater social benefit elsewhere. In this case, politicians may decide on discretionary capital transfers from the central bank to the national budget, which are not governed by a predetermined rule. In such a process, it is not implausible that other policy decisions will also be taken that may affect the central bank's independence (Berriel and Bhattarai, 2009). For this reason, among others, many central banks have predetermined rules on the share of central bank profits to be delivered to the national budget.

It is important to understand that central banks can never be fully independent. Independence is not a matter of zero or one, but a matter of degree. It also has different dimensions, both economic and political. On the one hand, there are several economic mechanisms that restrict independence. Reis (2013), for example, stresses that the central bank cannot create an infinite amount of financial resources, despite its monopoly, because there is a limit to how high demand for liquidity can be. An excessive supply of liquidity affects interest rates and inflation in a way that may be incompatible with the objectives and mandate of the central bank. Financial flows between

¹² For example, Ernhagen, Vesterlund and Viotti (2002) estimated that the Riksbank needed equity of SEK 35-55 billion. At this point, equity amounted to EUR 71 billion and banknotes and coins to EUR 107 billion, which together accounted for 75 per cent of total funding (balance sheet total). In 2000 and 2001, extra dividends were paid from the Riksbank to the national budget totalling SEK 40 billion. At the turn of the year 2021/22, equity amounted to EUR 66.5 billion and banknotes and coins to EUR 61.5 billion, which together corresponded to only 8 per cent of total funding.

¹³ Del Negro and Sims (2015) emphasise that the central bank's need for capital depends on how demand for money develops.

countries also affect the central bank's ability to design an independent monetary policy in an open economy. Traditionally, the view, based on the so-called Mundell-Fleming model, has been that as long as the exchange rate is flexible, monetary policy is not constrained by free capital movement. Rey (2015) states, however, that because of the development towards today's global financial markets, a flexible exchange rate no longer gives the same high degree of independence as the traditional Mundell-Fleming model implied. There is also a large literature on how the design of fiscal policy can affect the central bank's ability to achieve the objectives of monetary policy. It is not only about the experience that unsustainable public finances can lead to hyperinflation, but also about how more normal fiscal policy rules can affect the central bank's prerequisites (see Leeper and Leith, 2016, for a review). If the situation regarding public finances is difficult, it may also limit the ability of the central bank to retain any profits or to obtain a capital injection if needed.

In addition to such economic mechanisms that may limit monetary policy's room for manoeuvre, and also affect the need for financial buffers, there are obviously political mechanisms that restrict central bank independence. The legislation defining the objectives and mandate of the central bank is determined through political decisions.

Wessels and Broeders (2022) stress that no central bank can be considered fully independent in the longer run, especially because politicians can influence the basic legislation that regulates and defines the central bank's operations. However, even if a certain degree of dependence cannot be avoided in the longer term, central banks should be sufficiently independent not to be affected by political control in the short term. Wessel and Broeders argue that financial independence needs to be sufficiently high for a period longer than the current government's term of office; suggesting five to ten years. Equity that is temporarily below the target level need not be a problem in this case, as long as there is a low probability of having to request capital injections earlier than five to ten years ahead.¹⁴

The conclusion of the above reasoning is that the central bank's equity and its earning capacity should be high enough in the long run to ensure that the bank is sufficiently financially independent and should not need any funding from the national budget, at least not in the near future.

The principled reasoning above does not provide more precise guidance on when, or under what circumstances, a central bank may need to request capital injections from the national budget. If the central bank is incurring losses that are unlikely to be covered by future profits, and if its equity is expected to shrink, the level of cost-free capital may be so low that the probability of needing a capital injection becomes too high. However, precise critical levels of equity or probability are difficult to establish.

At the same time, political decisions on whether to actually inject capital obviously need to be based on some notion of how large the equity should be. For example, the

¹⁴ Kjellberg and Vestin (2019) present a similar idea, that financial independence can be measured by the probability that a capital injection will be needed in 10-20 years. In the Riksbank's decision on profit distribution in 2021, an ambition was expressed that capital and earning capacity should be large enough to recover a loss of SEK 10bn within five years (Sveriges Riksbank, 2022).

new Sveriges Riksbank Act sets a limit on how large, or how small, the Riksbank's equity shall be. It also specifies the conditions under which the Riksbank's equity is so small that it must apply for a capital injection from the Swedish parliament, the Riksdag. In the Riksbank's consultation response to the proposal for a new Sveriges Riksbank Act, the Executive Board of the Riksbank stated: "Moreover, the Riksbank considers that the adopted target level of SEK 60 billion jeopardises the Riksbank's possibilities for self-financing over a longer perspective. It does not ensure the Riksbank's long-term earning capacity and does not take enough account of variations in the size of the balance sheet and the financial risks entailed by the Riksbank's operations."¹⁵ In connection with the decision on profit distribution in January 2022, it was further stated that "the risk buffer needs to be increased by SEK 15 to 40 billion in order for the Riksbank to be able to maintain its financial independence in the long term" (Sveriges Riksbank, 2022).

The next section looks at why and how a weak financial position could affect monetary policy, both via policy expectations and through actual central bank decisions.

¹⁵ Sveriges Riksbank (2020). See Kjellberg and Vestin (2019) for a discussion of principle concerning the Riksbank's balance sheet and capital requirements and Ernhagen, Vesterlund and Viotti (2002) for an earlier assessment.

3 Why monetary policy could be affected by the financial position of the central bank

This section presents arguments that lead to the conclusion that there is a risk that a weak financial position of a central bank may have consequences for monetary policy, although these need not arise in the short run.

The independence of the central bank is a matter of degree and is not constant over time. For example, political decisions on the appointment of central bank management or changes in legislation could be influenced by the central bank's financial results. This in turn could have implications for monetary policy.

In principle, if a central bank incurs large financial losses, this can affect both public confidence in the central bank's operations in the short term and legislation in the longer term, depending on the reasons for the losses and how well the central bank manages to explain them. Partly, the losses may affect the central bank's reputation and confidence in its operations in general. Also, it may be perceived as becoming less independent if it has to negotiate with the government and parliament.

The financial position may also affect financial market confidence in central bank policy and thus have an impact on the functioning of financial markets. This, in turn, affects the impact of monetary policy on inflation and the real economy - even if the lack of confidence on the part of financial market participants is not well-founded.¹⁶ There is an extensive literature on how expectations can make it easier for the central bank to achieve its monetary policy objectives, i.e. on how good confidence increases the central bank's ability to achieve its objectives. Thus, if the central bank experiences financial problems that affect the level of confidence in it, this may have implications for its ability to achieve its monetary policy objectives.

Although the above arguments seem intuitively plausible, one also needs to explain why a lack of confidence in the central bank could be well-founded. That is, why a weak financial position could actually affect the central bank's monetary policy decisions and its risk tolerance, for example as lender of last resort or through quantitative easing. Theoretical analyses point in slightly different directions here. Del Negro and Sims (2015) provide some examples of how a central bank may be forced to abandon a policy of low inflation if its equity becomes too low, making it difficult for it to finance its operations without capital injections. Thus, there is a risk that the central bank would pursue an overly expansionary monetary policy leading to high inflation if it needs to generate more revenue and own profits. Klüh and Stella (2008) have pre-

¹⁶ Archer and Moser-Boehm (2013, p. 48) cite experiences in Japan and the euro area as examples of this. Del Negro and Sims (2015) present theoretical arguments concerning how expectations regarding the central bank can become self-fulfilling.

sented empirical studies, based on a large number of countries, which show a link between high inflation and a weak financial position of the central bank.¹⁷ Both Del Negro-Sims, who focus on the Federal Reserve, and Klüh-Stella argue that the central bank's position needs to be significantly weakened in practice for such a conflict to arise.

However, the risk that equity may become too low could affect monetary policy even before such a situation arises. For example, in contrast to Klüh-Stella and Del Negro-Sims, Berriel and Bhattarai (2009) argue that the central bank's consideration of its budget constraint and its equity may lead it to act more forcefully against increases in inflation than it otherwise would, so that inflation rises less and does not erode real capital.¹⁸

How the credibility of the central bank is affected by its financial position may depend on how stable the economic policy regime, in a broad sense, is perceived to be in other respects (Archer and Moser-Boehm, 2013). This applies not only to the degree of independence of the central bank, but also to issues such as the overall success of stabilisation policy, the (perceived) sustainability of fiscal policy, the rules governing profit distribution and capital injections into the central bank, etc. The stronger the support for central bank independence provided by the institutional framework and not least fiscal policy, the lower the need for equity. Archer and Moser-Boehm cite Chile, the Czech Republic, Israel and Mexico as examples of this. In these countries, central banks have operated with negative equity.¹⁹

Although financial losses and low equity do not affect the technical ability of central banks to conduct monetary policy, at least not in the short run, it may affect how they need to communicate about their monetary policy and financial results in order to maintain the confidence of their principals (politicians), market participants and the public at large (English and Kohn, 2022). Recently, several central banks have explained that they will incur financial losses and why, including: the US Federal Reserve (Bonis et al., 2018, and Anderson et al., 2022a and 2022b), the Reserve Bank of Australia (Bullock, 2022), the Reserve Bank of New Zealand (2022), De Nederlandsche Bank (Knot, 2022) and Sveriges Riksbank (Kjellberg and Åhl, 2022).

In conclusion, this literature review shows that it is certainly not desirable for the central bank to need to request a capital injection from the state, as such dependence could affect monetary policy. At the same time, there are also risks associated with

¹⁷ Adler, Castro and Tovar (2012) also find that observations of unusually expansionary policies are associated with the central bank having a relatively weak financial position. This relationship is significant for emerging market economies but not for developed economies. The authors interpret this as reflecting weaker institutions in the former group but also that central banks in emerging market economies have greater exposure to currency risk. Goncharov, Ioannidou and Schmalz (2021), examining different issues and using different methods and data, come to a different conclusion. Interest rates are lower and inflation higher when central banks make small profits, because the central bank is able to choose whether to recognise a loss or a profit and, in difficult situations (with high inflation and low interest rates), the central bank becomes reluctant to recognise a loss.

¹⁸ Del Negro and Sims (2015) also point to this possibility.

¹⁹ Archer and Moser-Boehm also point out that accounting rules can affect the need for equity and possibly also the behaviour of the central bank. Chaboud and Leahy (2013) also discuss the experiences of Chile and the Czech Republic, as well as some other countries.

operating with a permanently low level of capital, such as that it could, in the worst case, influence the central bank's decisions, making it more risk-averse, for example. Another risk is that it affects market participants' expectations about future policy decisions.

A weak financial position of a central bank can thus have implications for monetary policy, even when there is no need for capital injections in the near term. Therefore, if earnings capacity is low, so that the probability of needing a capital injection at some point in the foreseeable future is high, it may be better to request a capital injection at an early stage. This could reduce uncertainty about the independence of monetary policy, which could affect market participants' confidence in the central bank's ability to meet its objectives. The central bank is normally well placed to finance its day-to-day operations and cannot go bankrupt. Still, its ability to cover its costs and, in addition, to maintain financial buffers over the longer term is nevertheless important for independence and policy credibility.²⁰

²⁰ The emphasis on own earnings means that legislation, or agreements with the government, on more or less automatic capital injections in the event of losses or low equity does not obviously provide sufficient financial independence. This conclusion is in line with Wessels and Broeders' (2022) conclusion on guarantees (see footnote 7). However, whether this theoretical reasoning is consistent with practical experience is something that would be worth exploring further.

4 Are central banks sufficiently financially independent?

According to Wessels and Broeders (2022, p. 20), the financial independence of the central bank should extend beyond the term of the current government, so that no capital injection needs to be requested for five to ten years at the earliest. This section presents data from a few different central banks to illustrate how well this criterion is met.

Comparisons of financial losses and equity for different central banks are difficult to make, partly because of different accounting principles. Officially available information on financial losses also differs in terms of the periods referred to, for example whether they are losses incurred to date or expected losses in the future. The figures presented in this section should therefore be interpreted with great caution and be seen as illustrative examples. Nevertheless, we believe that they provide a sufficiently accurate picture to serve as a basis for a discussion of similarities and differences between countries.

Current forecasts suggest that the Riksbank's *reported* financial losses in 2022 may well mean that the Riksbank's reported equity will be negative after closing of the 2022 annual accounts.²¹ Forecasts of future profits and losses are of course uncertain, but if the Riksbank's results over the past five years can be taken as a measure of a normal level of profit, averaging around SEK 6 billion per year, it would take around ten years to recoup the losses that are being made now.

However, it can be argued that the Riksbank's financial results over the past five years are not a good benchmark, partly because developments in the financial markets can hardly be considered normal in a longer perspective (see Kjellberg and Åhl, 2022). Over the previous ten years, 2007-2016, profits averaged SEK 4.6 billion per year.²² The expectation that equity could be restored in around ten years may therefore be an overly optimistic calculation.

The Riksbank's situation is not unusual, in terms of the size of losses, in an international perspective - see Table 1.²³ The losses have essentially the same cause: central banks have purchased assets at a lower long-term interest rate than the cost of funding, which is at short-term rates and has risen sharply. Table 1 is based on officially

²¹ The Riksbank's reported results include unrealised losses in the asset portfolio, as bonds are reported at market value. If the market value of a bond is less than its acquisition value at the end of a financial year, the difference in value is recognised as a loss in the year's results and the acquisition cost is written down to current market value. However, if the market value of an asset exceeds its adjusted acquisition value, the year's reported results are not affected, i.e. unrealised profits do not affect the reported results. Instead, the assets are still marked to market on the balance sheet but a corresponding entry is made on the liability side in the form of a so-called revaluation account. There is thus an asymmetry in how changes in market values affect the Riksbank's financial results. See Kjellberg and Åhl (2022) for more details.

²² For the twenty-five years from 1997 to 2021, the profit averaged SEK 6 billion per year. All of these figures are affected by rules on how various unrealised profits and losses are treated using revaluation accounts.

²³ The selection of countries in Table 1 has been guided mainly by where it has been possible to find officially available information on actual or expected losses.

available sources, but it should be stressed that the data on expected losses are not fully comparable, as central banks have presented losses according to different definitions. Nevertheless, our assessment is that Table 1 gives a fair picture of the Riksbank's expected financial losses being somewhat smaller, relative to the size of the bank's balance sheet and the country's GDP, than those of the central banks of the United States, New Zealand and Australia. Compared to the situation in the Netherlands, the Riksbank's expected losses are smaller in relation to GDP, but larger in relation to the size of its balance sheet because the central bank in the Netherlands (DNB) has a larger balance sheet. It should also be noted that the projected losses for the Dutch central bank relate to a longer period than the figures for the other central banks.

There are large differences across countries, both in terms of the level of the central bank's equity, the rules for recapitalisation (see Chaboud and Leahy, 2013) and long-term earning capacity. Earning capacity relates to the levels of equity, banknotes and coins and other cost-free funding (see Kjellberg and Vestin, 2019). In Sweden, the Riksbank has so far delivered 80 per cent of a five-year moving average of profits to the national budget.²⁴ According to the new act that will enter into force on 1 January 2023, the target level for the Riksbank's equity is SEK 60 billion. The target level will be adjusted for inflation and if the equity is higher than the target level, the surplus will be delivered to the national budget. If equity falls below one third of the target level (that is SEK 20 billion in the initial situation), the Riksbank shall request a capital injection. The level of the Riksbank's equity at the end of 2021/22 was approximately the same, in relation to the size of the balance sheet and if revaluation accounts are included, as for DNB. This was also true for the euro area average.²⁵

In New Zealand, the central bank and the government agree every five years how much of the bank's income will be used to cover the bank's costs and how much will be remitted to the government. The level of equity is relatively low by international standards. When the Reserve Bank of New Zealand (RBNZ) decided to stimulate the economy through asset purchases during the pandemic, it had agreed with the government that any losses associated with this would entitle the central bank to an indemnity from the national budget.

The Federal Reserve in the US also has low equity and transfers virtually all profits to the national budget. Instead, when the Federal Reserve makes losses, these are recorded as a deferred asset, which means that the bank does not have to make any profit transfers to the federal state until the losses have been recovered through new profits. If one does the same calculation for the Federal Reserve as for the Riksbank and uses the profits of the last five years as a measure of normal profits (on average USD 79 billion per year), it will take just over nine years for the Federal Reserve to recoup its losses. Unlike the Riksbank, this calculation does not change if the average profits from 2007 to 2016 are used instead. The Federal Reserve also has a greater

²⁴ Since 2002, the Dutch central bank has delivered an average of 72 per cent of its profits to the national budget (see Wessels and Broeders, 2022).

²⁵ However, the levels of central bank equity in different countries are difficult to compare, for example because they follow different accounting rules and different principles for financial provisions.

chance of recovering losses, as the volume of banknotes and coins represents a much more important source of income than for the Riksbank.

For DNB, the ratio of losses to average profits five or fifteen years back looks similar to that of the Federal Reserve, i.e. the outlook is better than for the Riksbank. For the Reserve Bank of Australia (RBA), the reverse is true; the ratio of current losses to historical profits is much higher than for the Riksbank.

What, then, can be said about how well the central banks in Table 1 meet Wessels and Broeders' (2022) criterion of sufficient financial independence? If future profits are at historically normal levels, the Federal Reserve and DNB can be expected to recover losses in slightly less than ten years. This could be interpreted as a low probability that they will need a capital injection within the next ten years. For the Riksbank and the RBA, it is likely to take longer to restore the level of equity through operating surpluses. Instead, the RBNZ has a previously established guarantee from the state, which according to Wessels and Broeders does not provide as effective financial independence as a sufficiently large equity does.

The ability of central banks to cover their own operating costs and also to generate surpluses to create buffers also depends on the availability of cost-free funding other than equity, such as banknotes and coins and various buffers in the form of revaluation accounts and the like. As shown in Table 1, the sum of banknotes and coins and total capital (equity plus provisions and revaluation accounts) is at a similar level in relation to the balance sheet total at the Riksbank as at the RBA and the RBNZ. However, this level is about half of the levels of the Federal Reserve and DNB, which in particular have larger volumes of outstanding banknotes and coins.

In the case of the Riksbank, the probability of a need for a capital injection is thus increased by the fact that the monopoly on banknote issuance generates relatively low income - a relatively low volume of banknotes and coins is currently used and the outstanding volume is expected to develop weakly in the future as well. Kjellberg and Vestin (2019) point out that the Riksbank has a level of interest-free capital that is low from both a historical and international perspective, mainly because the amount of banknotes and coins has not grown in line with the rest of the economy but rather shrunk. The Riksbank's own conclusion has also earlier been that its equity has been too low (see Sveriges Riksbank, 2020, and Sveriges Riksbank, 2022).

Taken together, these figures suggest that the Riksbank's financial losses are not remarkably large from an international perspective. However, the probability of a need for a capital injection is greater in Sweden than in the United States and the Netherlands, countries where the central bank's earning power through banknotes and coins is considerably greater.

According to the reasoning in this report, a weak financial position does not impose any constraints on monetary policy in the short term, while a high degree of financial independence in the longer term is needed to maintain the credibility of an independent monetary policy. Finally, we would also like to repeat the arguments (see for example Archer and Moser-Boehm, 2013, and Leeper and Leith, 2016) that the credibil-

ity of the central bank is affected not only by its own independence and financial position, but also by the stability of the broader economic policy regime, including fiscal policy. Thus, what constitutes a sufficient degree of financial independence cannot be determined solely on the basis of such discussions of central banks' balance sheets and profit and loss accounts as presented in this paper. The question of whether central banks are sufficiently financially independent therefore has no clear-cut answer. However, the Riksbank is more likely to need to seek a capital injection than some of the other central banks in this sample, mainly due to the relatively low level of banknotes and coins outstanding and hence weaker earning power.

Tabell 1. Comparison with foreign central banks, a sample

In local currency

	The Riks- bank	RBA	Fed	RBNZ	DNB*
Estimated loss, bn	65	45	720	9	9
Total capital, bn	161	-12.4	59	3	43
Banknotes and coins	61	102	2,232	9	83
Balance sheet total, bn	1,564	626	8,890	94	510
GDP, bn	5,457	2,309	22,996	360	856
Estimated loss/GDP (%)	1	2	3	2	11
Estimated loss/balance sheet total (%)	4	7	8	6	2
Total capital/balance sheet total (%)	10	-2	1	3	8
Banknotes and coins/balance sheet total (%)	4	16	25	10	16

Note. *DNB reports its expected loss over a long period of time. Other central banks report estimated loss at present.

Measurements, measurement methods, time of measurement and intended period all differ in this comparison and should therefore be interpreted with great caution. Estimated loss is based on the latest available estimate published by the respective central bank. Total capital refers to equity plus provisions and revaluation accounts. Total capital, banknotes and coins and balance sheet total are based on the central banks' annual accounts for 2021 (for RBA and RBNZ annual accounts 2021/2022). GDP refers to GDP in current local currency for 2021 (for Australia and New Zealand 2021/2022). For details, see appendix.

Source: Source: national central banks and national statistical databases

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APPENDIX - Sources for comparison of central banks

Sources, Table 1

Estimated loss

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De Nederlandsche Bank (DNB): Knot, Klaas (2022), "DNB's capital position", letter to the Ministry of Finance, De Nederlandsche Bank, ref T045-1095693089-2814, 9 Sept 2022.

GDP

Sweden: Statistics Sweden

Australia: Australian Bureau of Statistics

United States: U.S. Bureau of Economic Analysis

New Zealand: Stats NZ Tatauranga Aotearoa

The Netherlands: Centraal Bureau voor de Statistiek

Total capital, Balance sheet total and Banknotes and coins

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