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Sveriges Riksbank's Foreign Exchange Reserve, 1823–2023

Gustav Ingman*

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Abstract: Recently, there has been increasing research interest in the historical composition of central bank reserves. However, studies in this area is hindered by a lack of data, as such data spanning multiple centuries is only available for a small number of countries. This paper presents an empirical analysis of the development of the Swedish Riksbank's foreign exchange (FX) reserves from 1823 to 2023. It introduces two new datasets: a monthly time series with the composition of the FX reserve's components from 1908 to 2023, and an annual dataset providing the distribution of foreign currencies within the FX reserve from 1823 to 2023. This paper offers new insights into the long-run evolution of the central bank reserves of Sweden, contributing to the broader understanding of the trajectory of historical foreign currency reserves. It is published together with an appendix file containing the data.

Keywords: Central bank balance sheet; Reserve currencies; Currency composition

JEL: E58, F31, N23, N24

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1 Introduction

In recent decades, there has been a growing interest in the management and composition of central bank reserves. However, research in this area is hindered by a lack of long-run data. Comprehensive data spanning centuries is only available for a few countries. For example, Ferguson et al. (2023) utilizes balance sheet data for 17 countries dating back to 1587 to investigate the effects of liquidity provision during financial crises. However, their data varies in detail, and for some parts, they are unable to decompose the bank's holdings, thus restricting the analysis to the total size of the balance sheet.

This paper provides an empirical overview of the development of the Riksbank's foreign currency reserve over the past 200 years. It achieves this by introducing two new datasets. Firstly, it maps the trajectory of the Riksbank's exchange reserve and its components on a monthly basis for the years 1908-1923. This data is harmonized with the existing annual data series of the Riksbank balance sheet compiled by Fregert (2014). The compiled data offer an overview of changes in the FX reserve composition over 200 years, with more high-frequency data available for the last 115 years. Secondly, it presents annual data on the allocation of foreign currencies for the entire investigation period.

Some recent studies that have explored historical central bank balance sheets provide details about foreign reserves. Fregert (2014) provides balance sheet data for the Swedish Riksbank, spanning from 1668 to the present. This data offers information about the composition of FX reserve items but not their currencies. Maurer and Halbeisen (2007) presents assets and liabilities for the Swiss National Bank between 1907 and 2006, including information about the currency composition of FX reserves for the years 1987-2006. Balance sheet data for Danmarks Nationalbank is provided by Abildgren (2016), where the currency composition is broken down into euro and non-euro for the years 1989-2014.

Norwegian balance sheet and income data from 1818 to the present are found in Eitrheim, Bay Fevolden, and Hvidsten (2022). It is complemented by a special study on the FX reserve for the same period, which offers detailed information about its structure as well as currency composition. (Eitrheim and Bay Fevolden 2022) The Norwegian study has been an important source of inspiration for conducting the research presented in this paper.

Eichengreen and Flandreau (2016) summarizes the last 150 years of central bank currency reserve strategies. Their study emphasizes three developments in central banking. Firstly, how different foreign currencies has been instrumental for international trade. From the rise of pound sterling as the principal reserve asset before 1914, followed by periods of both US dollar and pound sterling dominance until the end of the Second World War, to the US dollar dominance. Secondly, the periods leading up to the First World War, the interwar years, and the era of financial liberalization during the late twentieth century are singled out as periods of more active and innovative foreign currency management. Thirdly, central banking is closely tied to countries geopolitical relations and aspirations. However, the authors assert that data is scarce. Future data collection might contribute to a clearer picture.

Studies that focuses on shorter time periods also have problems acquiring detailed country level data. The IMF has compiled data on the composition of foreign reserves for over 60 years in the so called *Currency Composition of Official Foreign Reserves* (COFER) database, but it is only published as aggregates for advanced and development economies. Researchers has historically been given opportunities

to use disaggregated data underlying the database. (Dooley, Lizondo, and Mathieson 1989; Mathieson and Eichengreen 2000) But access to such data is today more restricted. (Arslanalp, Eichengreen, and Simpson-Bell 2022) As an alternative, researchers has instead turned to data published by central banks. (Iancu et al. 2022)

Unfourtunately, official publications rarely provide detailed data before the 2000s. The Swedish Riksbank, for instance, started to disclose the targets for the currency composition of its foreign reserve in its annual report in 1999. First from 2011 is the actual composition disclosed in its annual reports. With this study, we will for the first time be able to assess the changing composition of the Riksbank's foreign currency reserve over the last 200 years. As well as study the monthly shifts of its components over 100 years. Something that is today only possible to do for a few countries in the world.

Following this introduction, the second section of this paper will discuss the definition of the foreign currency reserve and provide a brief overview of its main trajectories. These definitions will then be used as a framework in the third section, where the use of sources is critically discussed. In the fourth section, the composition of the foreign reserve is studied in more detail as the period of interest is divided into four sub-periods. This section also provides some historical context to better understand the observed changes.

2 The FX reserve

A traditional definition of an FX reserve is that it should meet the requirements of safety, liquidity, and return. That is, it should consist of instruments with low or non-credit risk. A central bank should be able to sell the instruments used, both fast and to a low transaction cost. If the two first requirements are fulfilled, and without undermining them, one should aim at maximum return. (Borio, Galati, and Heath 2008)¹ Besides these requirements, the Riksbank has historically tried to fulfill more general goals: currency convertibility, price stability, securing the financial system and, stabilize the business cycle. (Fregert 2014)

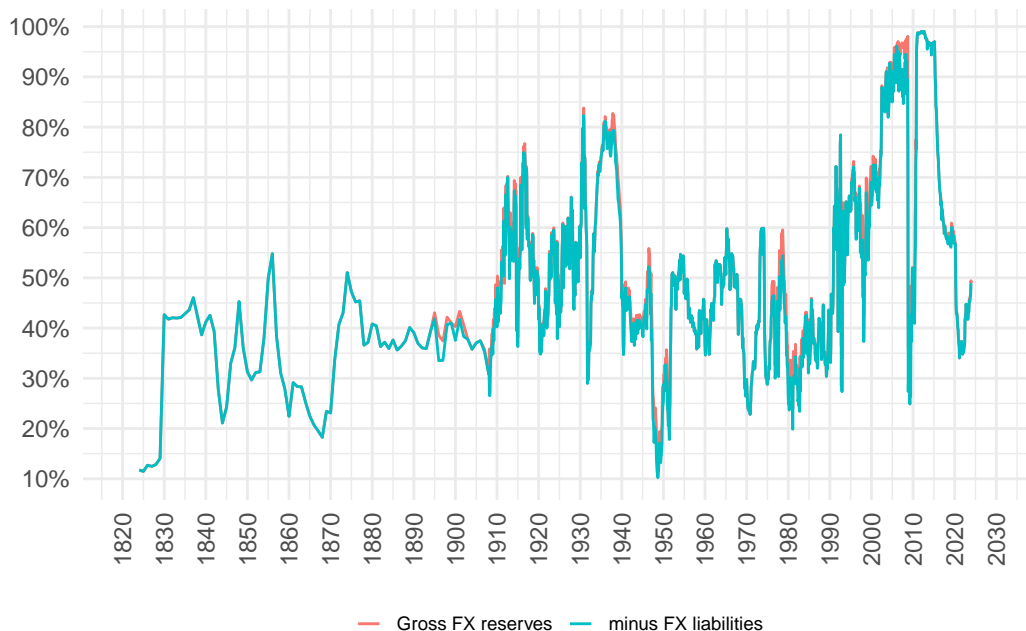
In the balance sheet of the Riksbank, numerous FX reserve items can be identified. These include: 1) metal reserves, i.e., gold, silver, and copper; 2) deposits, consisting of cash holdings in foreign banks or loans to foreign banks; 3) fixed-income securities, including bills of exchange and bonds; 4) claims on international organizations, such as the IBRD, BIS, IMF, and ECU; and 5) other assets.

Taken together, the above items constitute the gross FX reserve. By subtracting corresponding items on the liability side of the balance sheet, we arrive at the net FX reserve. This means accounting for liabilities to foreign banks and other foreign liabilities, as well as liabilities to international organizations. The currency composition of the FX reserve presented in this paper mainly corresponds to the net FX reserve.

¹These requirements have also been recognized by the Riksbank in its internal memos on the foreign reserve. See *Valutare-servens placering* 1989-01-30, in A 1 B: Bankofullmäktiges särskilda protokoll.

In Figure 1, the gross and net FX reserves in relation to total assets are compared. Two periods of relatively large FX reserves can be observed: one between the two world wars and another around 1990 until today. As can be seen, the gross and net series closely track each other throughout the entire period.

Figure 1: Comparisons of the Riksbank's gross and net FX reserve in relation to total assets.



3 Sources

This article explores two dimensions of the composition of the FX reserve of Sveriges Riksbank: its composition of items and its composition of currencies. Both dimensions build on information about reserves registered in the Riksbank accounts. However, information about them is not found in the same sources, and the data is not always structured in the same way.

3.1 Items

Information about the items in the FX reserve is gathered from reported balance sheets of the Riksbank. The Riksbank balance sheet from 1668 to 2011 has been compiled and described in Fregert (2014). For the years 1668-1924, his data builds on the compilation in the five-volume history of the Riksbank, which was published in celebration of its 250th anniversary. Its fifth volume consists of statistical tables, including end-of-year balance sheet data. (Simonsson 1931) This data provides information about the

asset size of foreign bonds, bills of exchange, and deposit. It has been utilized for the years 1823-1907 in this paper.

As noted by David Davidsson, one of the main contributors to the five Riksbank volumes, in 1931, the annual data comes with the problem that the effects of important events might not always be visible, and it is therefore mainly an indicator of longer trends. Higher frequency data might therefore be needed to catch important episodes in more detail.

From 1908 to 2001, the Riksbank published a statistical yearbook. This publication includes end-of-month tables of the bank's balance sheet for the years 1908 to 1986. Between 1986 and 2001, the data in the statistical yearbooks shows only numbers for each end-of-quarter. Therefore, the internal weekly report on assets and liabilities found in the archives has been used.² All this data has been gathered from 1908 to 1999. From the year 2000, the Riksbank publishes a weekly time series of its assets and liabilities available on its website. (Riksbanken 1999) Monthly data has been gathered from this report for years not covered in the yearbooks.

The categorization of assets in the balance sheets has changed over time. Ideally, one would like to take today's definitions as a point of departure and then use the same approach backwards. However, as some items are re-categorized over time, that has not been possible. For instance, for the years 1908-1951, foreign deposits are declared in gross terms on the asset side with corresponding liabilities on the liabilities side. After 1951, only the net position is reported in the balance sheets. However, until 1975, gross deposits are separately reported in the yearbooks. From 1976, only information about the net position is obtainable.

Foreign bills of exchange are included until 1975, but they are valued at 0 already from November 1969. Foreign bonds are separately reported until December 1983. After that, foreign bills, foreign bonds and net foreign deposits are compiled under one category and are no longer separable.

Lastly, in the weekly reports from 1999 onward, the category 'Claims on residents inside Sweden denominated in foreign currency' is introduced. Values for it only appear in 2008, 2009, and 2020. Following international practice, this data has not been included in the FX reserve. However, I do include it in the statistical appendix.³

Before 1844, the Riksbank did not formally hold any foreign currency assets. However, the reserves included precious metals such as gold, silver, and copper. Before 1829, the metallic reserve is reported as one item, and it has not been possible to decompose it for this study.

The valuation of the gold price can for some years be misleading. With the introduction of the gold standard, the gold value was set to 2048 kronor per kilogram. (Jonung 2000) The Riksbank continued to book gold at that value, even after the collapse of the gold standard in 1931, until the end of 1946. From December 1946 to December 1969, gold was divided into two items in the balance sheet: book value and surplus value (the difference between market value and book value). From 1971, gold was once again valued at a set rate. While the difference between book and market price is discussed in this

²See at Sveriges Riksbank: B4A Riksbankens publikationer: Statistisk årsbok and B4E Riksbankens publikationer. Översikt över Riksbankens tillgångar och skulder.

³Domestic claims denominated in foreign currency are discussed in Eitheim and Bay Fevolden (2022).

paper, I have followed the Riksbank's official valuation when illustrating the foreign reserve. Since December 1998, gold is valued at its market price. Therefore, during the years 1931-1946 and 1971-1998, there is a notable divergence between the officially reported value of the gold holdings and its estimated market value.⁴

3.2 Currencies

It has proven surprisingly hard to find detailed information on the currency composition of the FX reserve. For long time periods, the exact currency composition was classified information and not publicly disclosed. In the archives, information is neither found in a specific section nor uniformly categorized in compilations. A lot of work has been put into the identification and processing of relevant material.⁵

Table 1 shows the variety of sources used to decompose the foreign currency assets of the Riksbank. All information about the Riksbank's assets and their development on a daily basis should be possible to find in the account's general ledger. The problem is that the detail level of that data makes it very time-consuming to compile for longer time periods. Therefore, other sources have been utilized when possible. Only for the years 1844, 1854, 1856, 1857 and 1918 has it been necessary to turn to the ledgers.

In the period leading up to the First World War, the currency composition is disclosed in annual reports to the Riksdag. This data is typically divided into two sections: first, each bond is listed together with its book value. In another section, the so-called foreign activities (utrikesrörelsen) are described in nominal terms. Here, information on foreign deposits and bills of exchange are disclosed. Values has typically been recalculated from foreign currencies into Swedish kronor for the present paper. For the years 1912 to 1914, the foreign activities are described in the annual statistical yearbooks. However, the yearbooks lack detailed information about foreign bond holdings. Instead, these has been collected from separate, handwritten, summaries which were kept between 1899 and 1927.

Table 1: Sources to the currencies composition.

Period	Source	Items covered	Date	Archive
1823-	Accounts: General ledger			Riksarkivet, Riksbanken archive
1847-1866	Appendix to the minutes of the Riksdag of the Estates	Deposits, Bills of exchange, Metals	EOY	Kungliga biblioteket

⁴For further discussions on the bank's valuation practices of metal reserves, see Fregert (2014), p. 350.

⁵I am grateful to Mats Bay Fevolden from Norges Bank, who accompanied me for two full days in the archives, helping me locate source materials, and to Daniel Höffker, archivist at Sveriges Riksbank, who provided valuable assistance and guidance throughout the data collection process.

Period	Source	Items covered	Date	Archive
1866-1912, 1914	Appendix to the Riksdag minutes	Deposits, Bills of exchange, Bonds, Metals	EOY	Kungliga biblioteket
1912-1936	The Riksbank annual accounts	Deposits, Bills of exchange, Bonds, Metals	EOY	Riksbanken archive
1912-1914	Statistical yearbooks	Deposits, Bills of exchange	EOY	Riksarkivet
1899-1927	Summaries of foreign government securities and bonds	Bonds	EOM	Riksbanken archive
1933-1975	Statistical report on foreign currency assets	Reserves	EOM (some years EOW)	Bankofullmäktige Särskilda protokoll
1935-1945	Statistical report on foreign currency assets	Reserves	EOW	Riksbanken archive
1947-1958	Statistical yearbooks	Reserves	EOQ	Riksarkivet
1963-2023	IMF COFER	Reserves	EOQ	IMF
1987, 1988, 1990-1997	Report on the allocation of the foreign reserve	Reserves	EOY	Bankofullmäktige Särskilda protokoll
1990, 1993-1995	Statistical material	Reserves	EOY	Riksbanken archive
1999-2010	Riksbanken's Annual report	Reserves (target allocation)	EOY	Riksbanken
2011-2023	Riksbanken's Annual report	Reserves	EOY	Riksbanken

From 1915 to 1933, the currency composition could only be obtained from the annual accounts of the Riksbank. They consists of handwritten compilations of the Riksbank's assets and liabilities at each year-end. It is typically divided into bonds valued in kronor, deposits (or correspondents), and bills of exchange. In the latter two cases, the values are sometimes given in kronor, and sometimes in nominal values.

An example of how this material might look is given in Figure 2. The picture shows foreign correspondents, i.e., foreign deposits, at the end of 1916. I have assumed that the holdings are in the main currency of the country in which the bank is located if nothing else is stated. The gross foreign bank deposits in the balance sheet are equal to the sum of the positive net positions with each bank, the gross liabilities to foreign banks are equal to the sum of the negative net positions with each bank, and the net

foreign deposits are the sum of all net positions with each bank. For the specific year illustrated here, all amounts are given in kronor, so there is no need to convert the sums from their respective currency.

Figure 2: Example of source material. List of deposits in the Riksbank's annual accounts 1916.

23

Debet.

Utländska

In Rikens peni år 1915		Kredit	
Rekryterat i följande räkningar		i huvudsakligen	
A. A. Riksbankens bank	London	369	99 916 43
E. J. Hambro & Søn		370	15 446 285 01
Swedish Bank of Commerce		371	1 178 983 36
Swedish Bank of Commerce		372	1 759 51
Swedish Bank of Commerce		373	2 451 187 71
Swedish Bank of Commerce		374	307 01
Swedish Bank of Commerce		375	964 771 57
E. C. Bremer		376	484 57
E. C. Bremer		377	135 38
A. M. Warburg & Søn		378	5 751 536 53
Swedish Bank		379	481 33
Swedish Bank		380	11 537 637 43
Swedish Bank		381	11 833 613 15
A. M. Warburg & Søn		382	915 349 15
Swedish Bank		383	391 922 57
Swedish Bank		384	1 191 45
Swedish Bank		385	54 184 45
Swedish Bank		386	129 49
Swedish Bank		387	5 441 52
Swedish Bank		388	562 979 12
Swedish Bank		389	912 844 74
Swedish Bank		390	—
Swedish Bank		391	5 114 173 35
Swedish Bank		392	443 780 63
Swedish Bank		393	914 833 65
Swedish Bank		394	139 789 52
Swedish Bank		395	73 415 470 59
Swedish Bank		396	1 457 52
Swedish Bank		397	21 310 249 33
Swedish Bank		398	45 973 170 02
Swedish Bank		399	11 955 449 22
Swedish Bank		400	1 352 574 75
Swedish Bank		401	210 694 481 71
Swedish Bank		402	57 084 129 49

kontant

Korrespondenter

Kredit.

In Rikens peni år 1915		Kredit	
Rekryterat i följande räkningar		i huvudsakligen	
A. A. Riksbankens bank	London	369	10 545 80
E. J. Hambro & Søn		370	19 461 910 59
Swedish Bank of Commerce		371	1 661 348 33
Swedish Bank of Commerce		372	2 468 63
Swedish Bank of Commerce		373	2 162 510 91
Swedish Bank of Commerce		374	950 47
Swedish Bank of Commerce		375	531 475 32
E. C. Bremer		376	422 52
E. C. Bremer		377	532 35
A. M. Warburg & Søn		378	2 767 003 79
Swedish Bank		379	1 875 99
Swedish Bank		380	19 837 165 11
Swedish Bank		381	10 161 478 66
A. M. Warburg & Søn		382	397 501 56
Swedish Bank		383	1 044 439 43
Swedish Bank		384	— — 45
Swedish Bank		385	1 358 471 66
Swedish Bank		386	— — 30
Swedish Bank		387	227 100 23
Swedish Bank		388	120 494 60
Swedish Bank		389	1 021 539 21
Swedish Bank		390	1 436
Swedish Bank		391	4 420 814 04
Swedish Bank		392	443 780 63
Swedish Bank		393	921 304 13
Swedish Bank		394	139 789 52
Swedish Bank		395	73 415 470 59
Swedish Bank		396	1 457 52
Swedish Bank		397	21 310 249 33
Swedish Bank		398	45 973 170 02
Swedish Bank		399	11 955 449 22
Swedish Bank		400	1 352 574 75
Swedish Bank		401	210 694 481 71
Swedish Bank		402	57 084 129 49

the breakup of Austria-Hungary. In these cases, I have assumed that the conversion rate did not change, and instead, the last known rate has been used.

Even if most of the exchange rates are based on numbers reported by the Riksbank, it is not always the case that these rates were actually used by the Riksbank in its accounts. While the statistical yearbooks changed practice, from presenting annual averages to end-of-month and end-of-year rates. But, it has not always been possible to obtain the exchange rates actually utilized and, especially in times of turmoil, market rates might deviate from the booked rates.⁷

From 1933 to 1963, I have calculated the currency composition from a special report that was attached to the so-called special minutes of the Riksbank's board (*Bankofullmäktiges särskilda protokoll*). These reports were issued weekly and provided a summary of the foreign currencies held by the Riksbank. Between 1933 and 1945, this publication reports the estimated market value of the foreign reserve, which differs slightly from its book value. Before 1959, all the main currencies are summarized. From 1959 to 1975, only the holdings in dollars are explicitly given.

From 1963 to 2010, the IMF's database Currency Composition of Official Foreign Exchange Reserves (COFER) has been utilized. This database provides information about the net foreign holdings in US dollars, Euro, Chinese Renminbi, Japanese Yen, Pound Sterling, Australian dollar, Canadian dollar, and Swiss franc. Unfortunately, a large part of the Riksbank's FX reserve from the 1980s onwards was held in French franc and Deutsche mark. Although these two currencies were reported to COFER until 1999, it has not been possible to obtain their values. Instead, they are found together as a residual category. For the years 1990, 1991 and 1993-1995 it has been possible to complement the COFER-data with statistical material found in the Riksbank archive.

Between 1989 and 1998, the Riksbank produced several internal reports on the foreign reserves allocation. These were typically included in the Riksbank's board special minutes. In these reports, the end-of-year currency composition is disclosed. However, the calculated data includes futures contracts, which are not included in the reported FX reserve, and the numbers are therefore not directly comparable to the COFER data. Still, these reports do give us an indication of the composition of what is hidden behind the residual category in the COFER data.

From 1999 to 2010, the annual reports of the Riksbank provide information about the target allocation of the FX reserve. The actual allocation typically fluctuated closely around the target allocation.

Finally, the annual reports state the actual end-of-year currency allocation from 2011 onward. As this data is more detailed than the COFER data, but otherwise fully in accordance with it, it has been utilized in this paper.

There is a difference between the total sum of the foreign currency reserve found in the annual reports and the total sum obtained through the currency decomposition. The differences arise mainly due to two reasons: 1) different sources are used. Therefore, the numbers found in the annual reports might have been calculated differently than the ones used to obtain the currency composition and, 2) currencies are sometimes denominated in nominal values and must be converted into Swedish kronor.

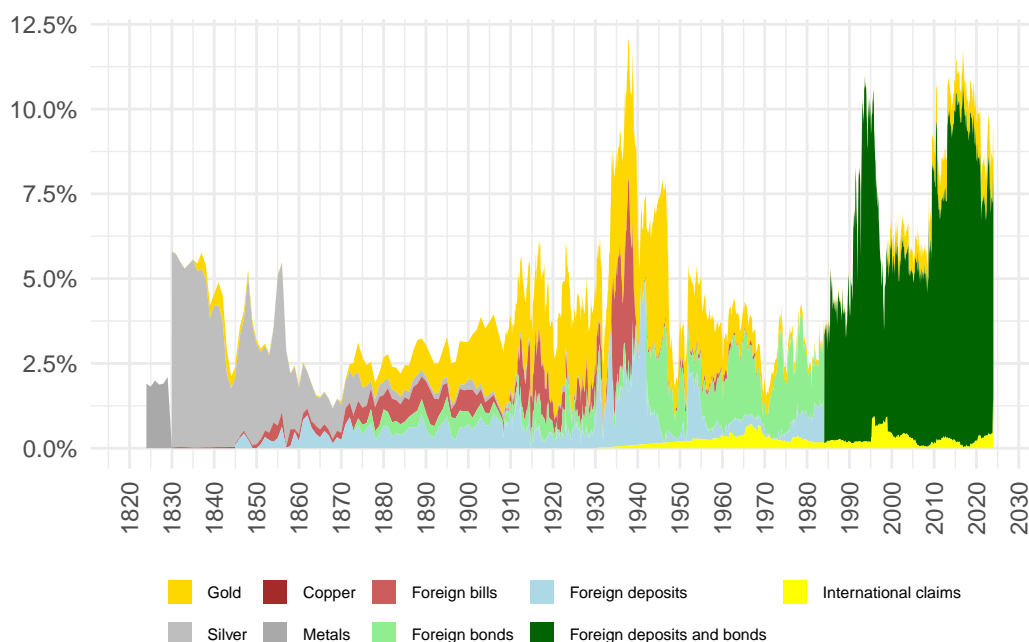
⁷A consequence of this was that assets could be sold under or over their values. The difference between the book value and selling price was summarized in a separate entry in the balance sheet until 1946.

Sometimes, it has not been possible to find the exact conversion rate used by the Riksbank. Instead, end-of-year market rates have been utilized. Similar kinds of problems have been observed in similar studies. (Eitrheim and Bay Fevolden 2022, 132)

4 200 years of FX reserves

Over the course of 200 years, the size and composition of the Riksbank's FX reserve have changed considerably. This is evident from figure Figure 3, which depicts the net FX reserve's size in relation to Sweden's GDP.⁸ At the beginning of the period, the FX reserve amounted to around 2 percent of GDP. By the end of 2023, its relative size had grown to around 9 percent. In between, it has fluctuated considerably. Three peaks are visible, after 1940, 1990, and 2008. The foreign reserve has increased since 1990, even when we disregard the spikes.

Figure 3: Net foreign exchange reserves relative GDP, 1823-2023.



If we now look at Figure 5 and Figure 6, the proportions of the foreign reserve's content are visible.⁹ In the allocation of items, some broad general trends emerge. In the beginning, precious metals were the most important FX asset; first silver and later gold. The Riksbank acquired its first foreign currencies

⁸GDP is here measured as GDP by expenditure, published by Edvinsson (2014).

⁹In some cases, foreign currencies has a negative net value. When proportions are shown, these values has been set to 0. Negative values are not common and typically small in relation to total foreign assets. They can be seen in the figures showing shorter time periods.

in Hamburg in 1844, and in the coming four decades it would grow in size until becoming equal in proportion to the metallic reserve.

Initially, the Riksbank only held deposits and bills of exchange denominated in Hamburger banco. But the reserves soon also comprised French franc and British pound sterling, along with smaller amounts of other currencies. In the second decade of the twentieth century, the US dollar became increasingly important. With the end of the Second World War and the introduction of the Bretton Woods system, the dollar became the most important currency.

Before WW2, gold, deposits, bills of exchange, and bonds were the most important FX items. After the war, bills of exchange were no longer used, and foreign bonds grew in relative size. After 1951, the Riksbank also acquires net positions in the International Bank for Reconstruction and Development (IBRD) and in the International Monetary Fund (IMF). During this period, the relative weight of gold decreased.

The relative stagnation of the size of the gold holdings after the end of the gold standard in 1931 and after the Second world war are, however, exaggerated. The Riksbank's accounting principles stipulated a set price for gold despite a fluctuating market value. Had one instead valued gold at its market price, another picture would emerge. This can be observed in Figure 4, where the estimated market value of gold relative total assets are plotted against the book value of gold relative total assets.¹⁰ Both in 1931-1946 and 1970-1998, there is a clear divergence between the two series. When the Riksbank changed its accounting principles in December 1998, its book value of gold increased from 909 million kronor to 13 834 million kronor.

In the 1980s, the Riksbank started to take measures to diversify its holdings away from the previous US dollar dominance. The proportion of Pound sterling rised together with the Japanese yen, French franc, and Deutsche mark, the latter two hidden behind the category "other". Also, the Euro was included after its introduction in 1999.

To better understand the changes in the FX currency allocation, the data will be divided into four time periods: 1823-1873, 1873-1920, 1920-1973, and 1973-2023. The periods are chosen a bit arbitrary, but roughly corresponds to major changes in the Riksbank's FX holdings.

4.1 1823-1873

The Riksbank started to collect a metal reserve already back in 1668 to back its deposits held under its lending operations. In 1777, the banking committee set a goal to cover notes and deposits at a rate of 75 percent, aiming to ensure convertibility between silver and notes and uphold the value of money. However, this goal of a three-quarter rate was never reached. Between 1808 and 1833, starting during the 1808-1809 war with Russia, a period of inconvertibility provoked the Banking Committee that run the Riksbank to set new goals to ensure the silver backing of notes. (Edvinsson and Ögren 2014; Fregert

¹⁰The market value of gold is estimated by dividing the book value of gold with its book price to arrive at the volume of gold held by the bank, and than multiply this number with the market price reported in the Riksbank's statistical yearbooks.

Figure 4: Gold assets in proportion to total net foreign assets, 1929-2023.

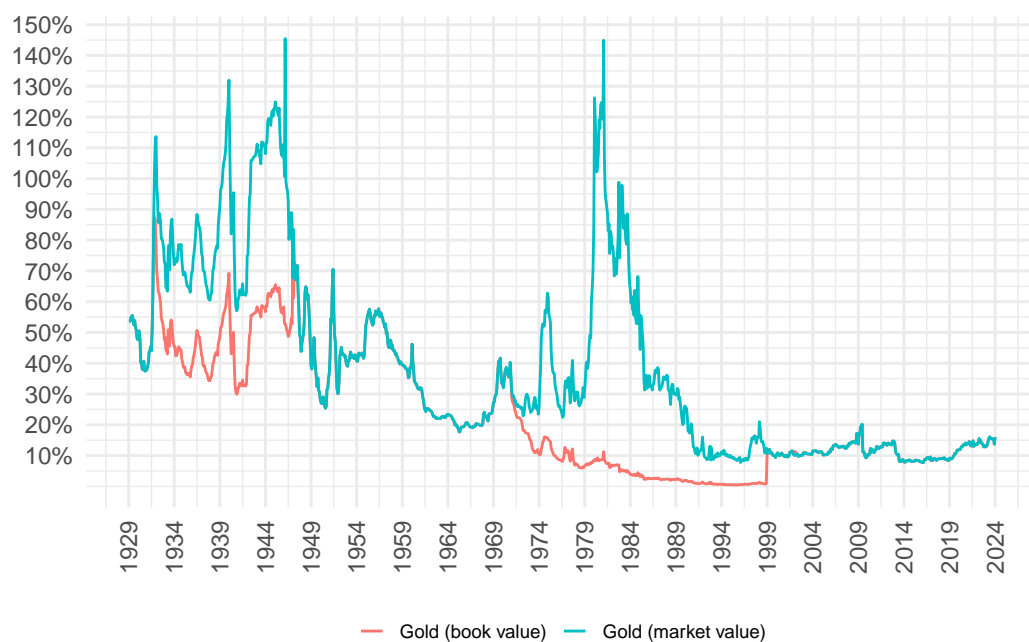


Figure 5: Net foreign exchange reserves by item, 1823-2023.

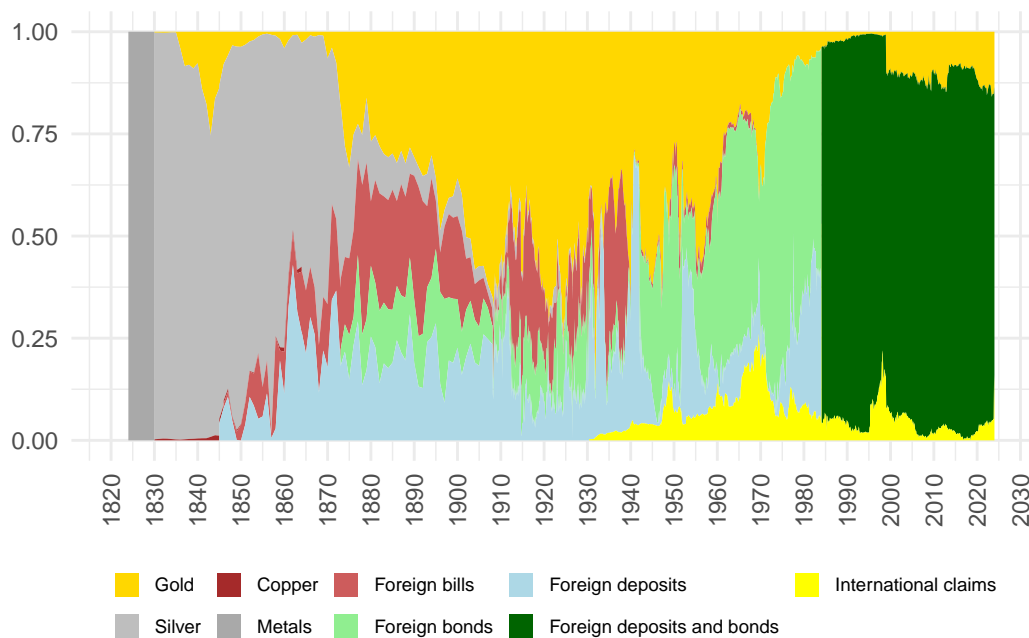
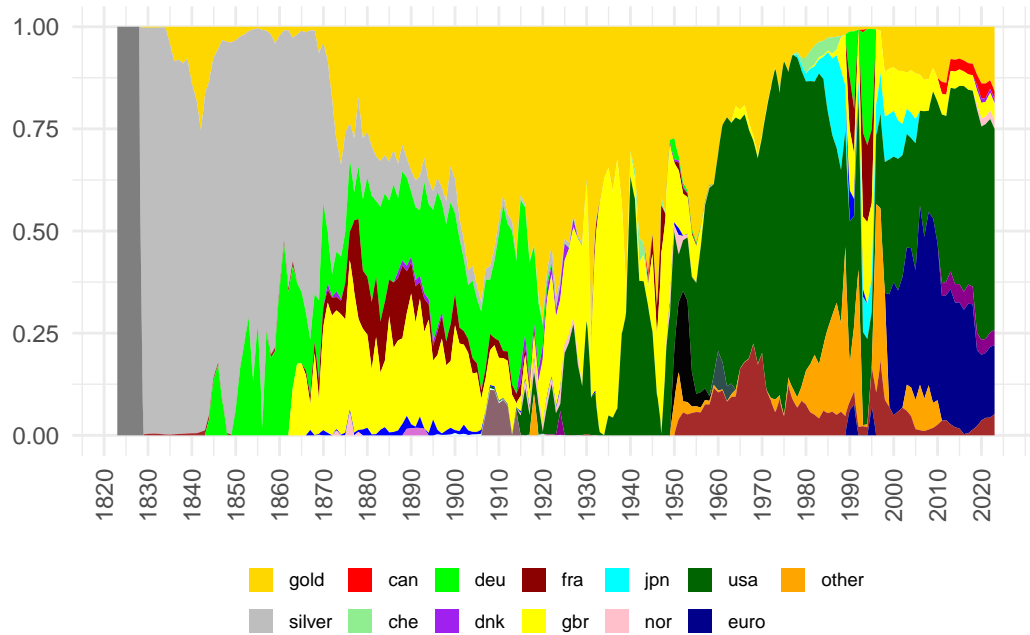


Figure 6: Net foreign exchange reserves by currency, 1823-2023.



2018) Even if silver was the main item in the metal reserve, the Riksbank also held small deposits of gold and copper. This is evident from Figure 7 and Figure 8.

In 1835, the so-called note-cover reserve requirements (*sedeltäckningskravet*) were introduced, setting a limit for notes in relation to reserves. In different forms, these requirements were in place until 1974. From 1835 to 1845, the required reserves only included silver. In 1845, it was broadened to also include gold, foreign bills, and credit at foreign banks. (Fregert 2018; Davidsson 1931) This theoretically meant that if reserves decreased, the Riksbank should lower the amount of base money in circulation. In practice, however, such measures were used to a small degree. Often, the Riksbank prioritized providing liquidity and credit instead of strictly adhering to the rules. The introduction of foreign reserves in 1844 provided the Riksbank with an instrument to adjust its reserves without importing specie. (Ögren 2012)

The Riksbank was initially forbidden to hold foreign reserve outside of Hambrug-Altona. Not only because Hamburg was an important financial center located near Sweden. Hamburg had its currency denominated in silver. In 1862, the Riksbank was allowed to hold foreign reserves in Berlin. A growing trade with Great Britain made these restrictions untenable. In 1863, the Riksbank became free to hold reserves wherever the bank wanted, and one quickly made arrangement with English banks in order to build up a reserve in Pound stearling. (Brisman 1931)

Figure 7: Net foreign exchange reserves by item, 1823-1873.

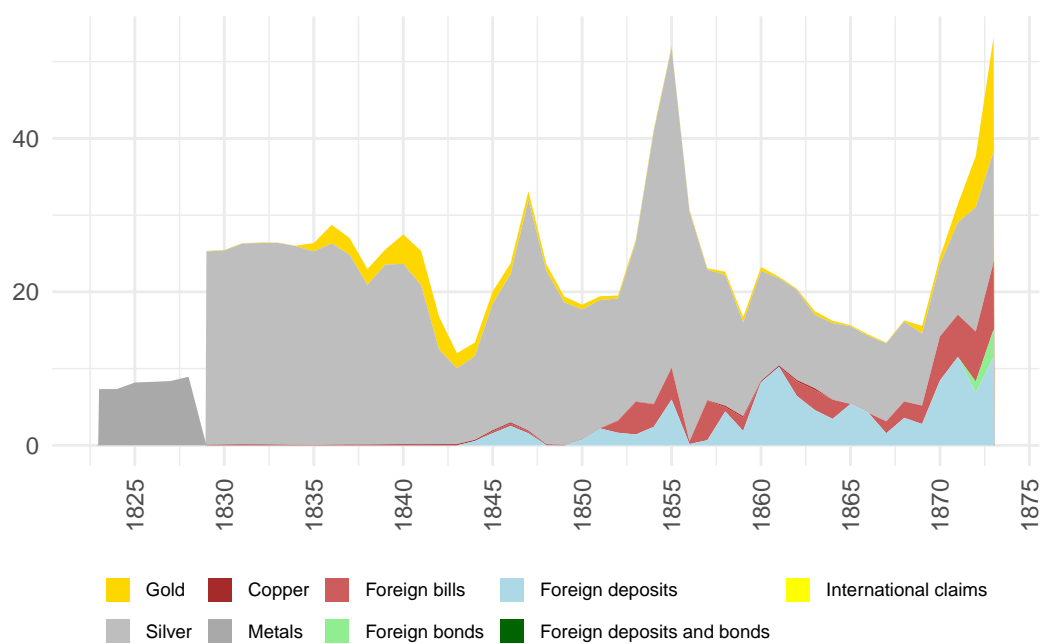
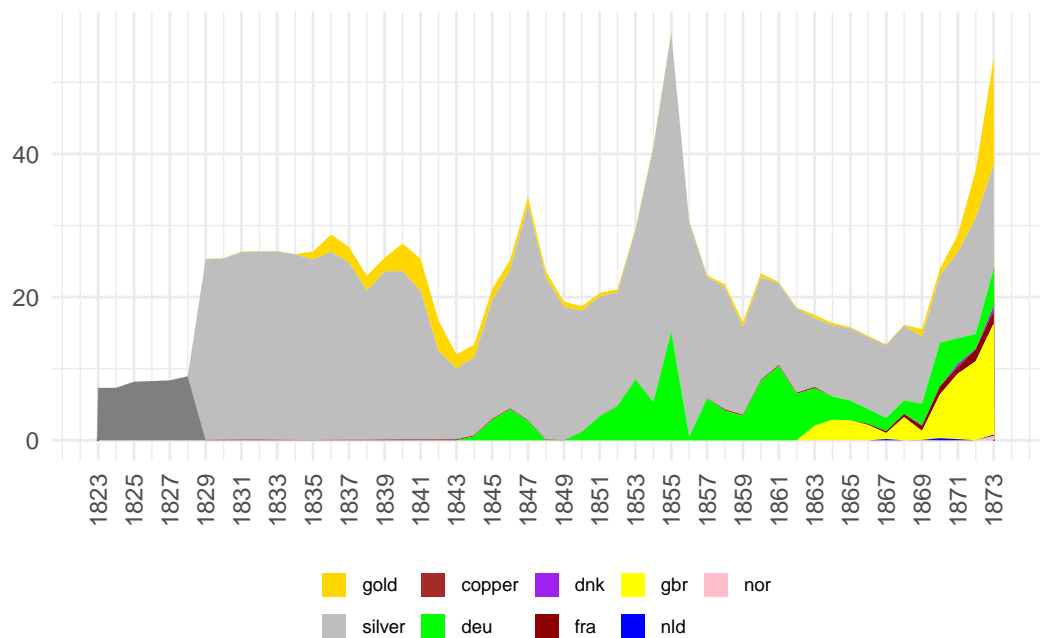


Figure 8: Net foreign exchange reserves by currency, 1823-1873.



4.2 1873-1920

With the introduction of the Scandinavian Monetary Union (SMU) in 1873, Sweden and Denmark, changed from silver to gold standard in 1874 and 1875 respectively. As a consequence, the bank started to increase its gold reserve in relation to the silver reserve. The Union stipulated that its member countries were to accept each others coins as legal tender, all denominated in the unit *krona*. Norway joined the union in 1875. This agreement was later complemented with a non-binding agreement to also accept notes. (Wetterberg and Hort 2009; Edvinsson 2010) At the same time, the note-cover requirements were set in gold only, not silver nor foreign holdings. However, the bank's right to hold foreign holdings was extended to also include bonds. The SMU are often thought to have ended in 1917, as gold exports between its members became prohibited. However, remaining clearing mechanisms as well as continued coordination attempts between the central banks indicate that the union, in practice, lived on until 1931. (Ögren and Trautwein 2022; Rongved 2024)

In Figure 9 and Figure 10, it is evident that the largest changes in the composition of the FX reserve started to happen in the 1900s. The gold reserve starts to increase faster by the end of 1900, and from around 1910 onward, the currency holdings grow in size. The Riksbank's holdings in Pound sterling increase, and in 1914, the US dollar is introduced into the foreign portfolio. After the end of the First World War, the Riksbank asserted that a strong balance of payments before and during the war led to an accumulation of metal reserves and foreign assets. Furthermore, the convertibility of gold was suspended in 1914, which decreased the outflow of gold from the country. (Fregert 2018)

Figure 9: Net foreign exchange reserves by item, 1873-1920.

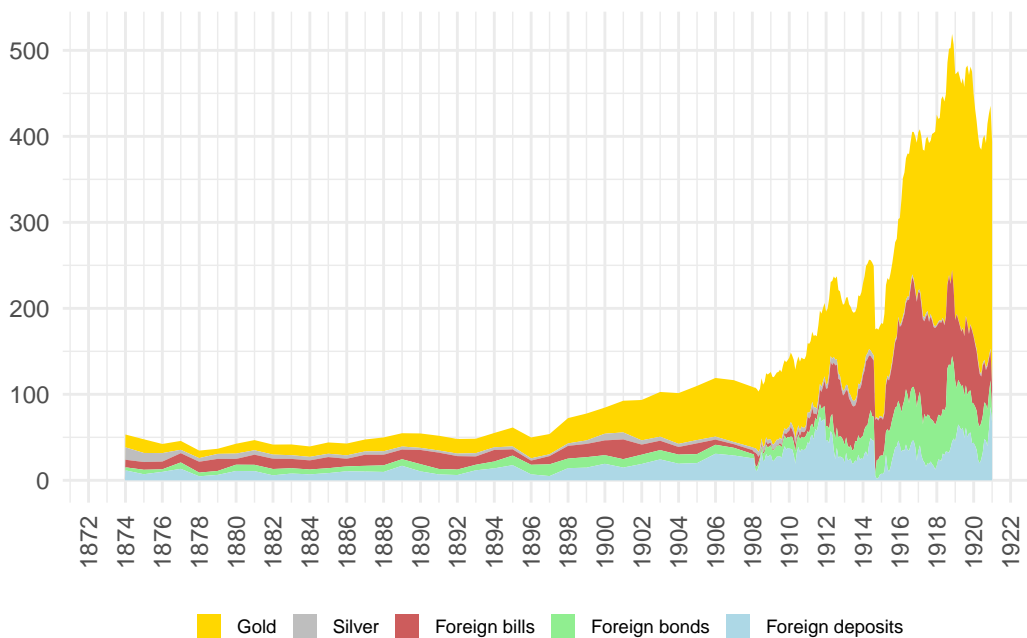
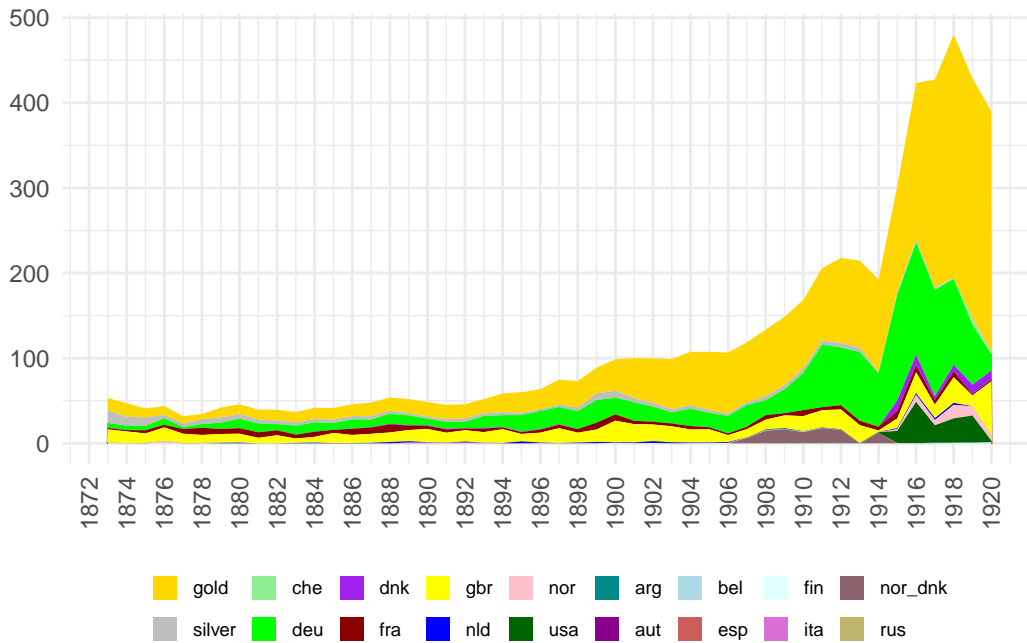


Figure 10: Net foreign exchange reserves by currency, 1873-1920.



4.3 1920-1973

In the interwar period, international studies has found that both US dollar and Pound sterling were aspiring to become the dominant international currency. The Pound sterling came to regain the top position after the 1930s crisis. But, as the US achieved a dominant economic position - at least in the West - after the Second World War, this was reflected in the dollar dominance in central banks foreign currency holdings. (Eichengreen and Flandreau 2016) Figure 12 shows that this narrative also applies for the Swedish experience. The Riksbanks came to accumulate relatively large dollar reserves before the crisis of 1930, but after the crisis it came to rely first and foremost on Pound sterling and gold until the outbreak of the Second World War.

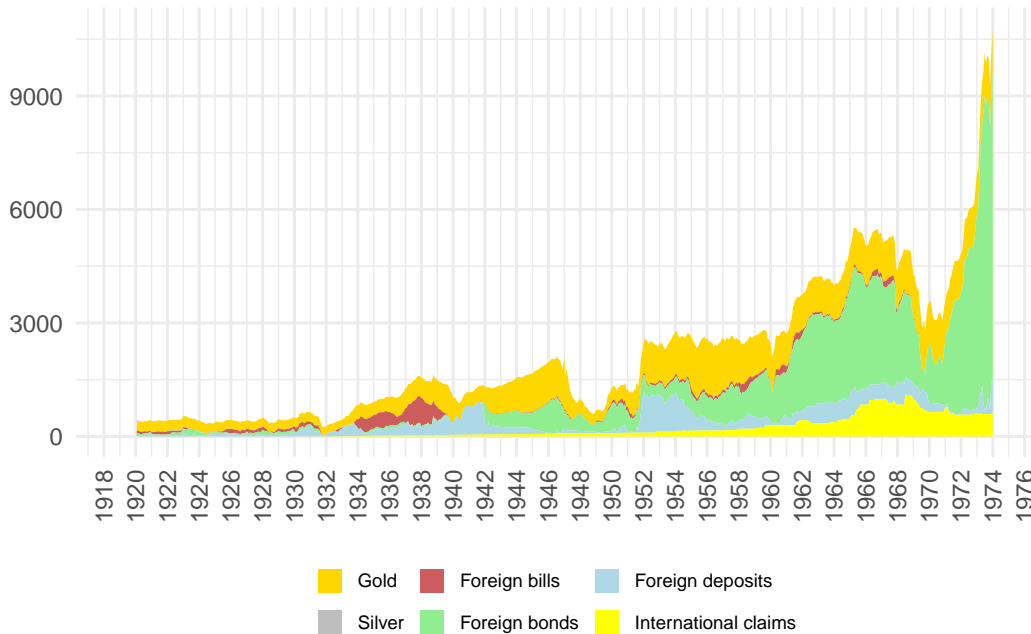
Interestingly, the crisis 1930 came to put pressure on the gold standard as norm. After England had abandoned the gold standard in September 1931, due to speculation against the pound, the Riksbank's foreign reserves quickly decreased as it tried to defend the Swedish currency in relation to the gold price. This can be observed in Figure 11. The Riksbank left the gold standard one week after Britain.

At the same time, Swedish authorities introduced a policy to defend the Swedish exchange rate, and therefore the Riksbank - for the first time - got price stability as an outspoken policy aim. The Riksbank tried to tie the krona to the Pound sterling in November 1931. However, due to a rapid outflow of foreign reserves, that experiment had to be abandoned only three days later. One lesson drawn by the Riksbank from this episode was that a future fixed exchange rate would probably require larger foreign holdings.

To increase the foreign reserves became a goal for the bank during the coming years. In the summer of 1933, the exchange rate against the pound started to stabilize. (Jonung 1979; Fregert 2018)

In the first years of the Second World War, the Riksbank countered mitigating liquidity with the buying of Swedish government bonds, and at the same time, the current account had a growing surplus. The latter led to an increase of foreign exchange reserves and in a growing gold reserve. The increase in foreign holdings continued after the war as Swedish exports grew. (Fregert 2018)

Figure 11: Net foreign exchange reserves by item, 1920-1973.

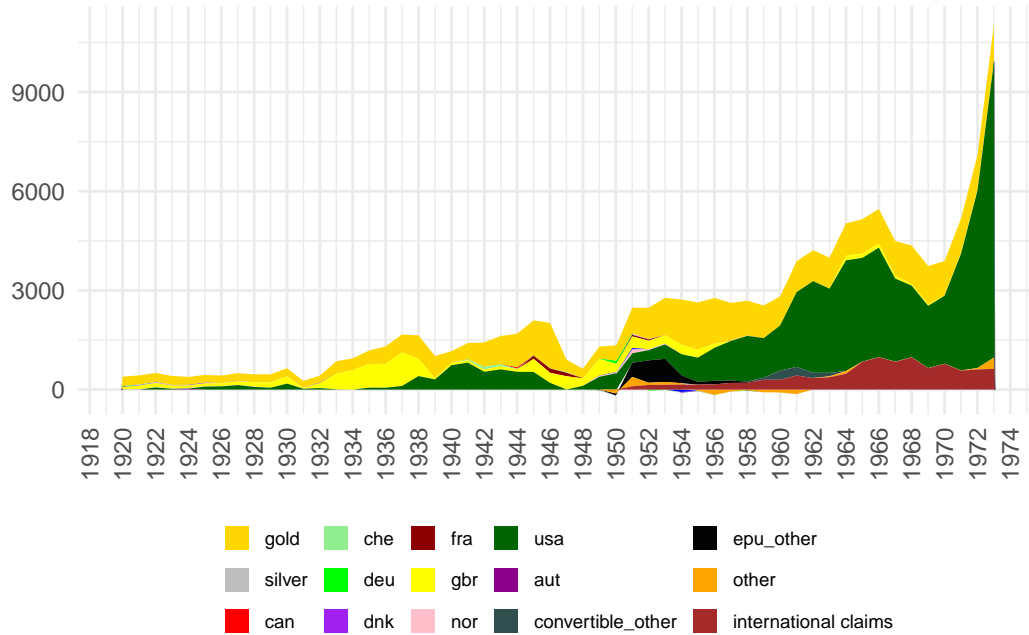


Two aspects that characterizes the development after the world war is the rise and growth of international organizations, and the predominance of the US dollar in the Riksbank's FX reserve.

As it became clear that Germany were to loose the war, the contours for the organization of the international community after the peace were beginning to be sketched up. In 1944, the Bretton Woods conference took place. It led to the establishment of the US dollar as the western world's main currency, as it became convertible to all other currencies within one percent of a fixed parity rate. The dollar, in turn, became convertible to gold at a fixed rate. (Eichengreen and Flandreau 2016) To counteract competitive devaluations, the International Monetary Fund (IMF) was established. It could lend reserve currencies to its members needed to balance payment deficits. Furthermore, the Bank for Reconstruction and Development (IBRD) was also launched to help with the funding of the rebuilding of Europe after the war.

Sweden had joined the Bank of International Settlements (BiS) already in 1930. The first claim on an international financial organization appears therefore in May 1930, as Sweden makes a payment

Figure 12: Net foreign exchange reserves by currency, 1920-1973.



to the bank. The item disappears in November 1931. (Fregert 2014) Sweden joined the IMF and the IRBD in 1951. Its shares in the banks appears both on the asset and liabilities side, with the latter representing the part of the initial contribution that were not paid immediately. Initially, the Riksbank's net position vis-à-vis the IMF was its Quota in the IMF plus its lending minus credit from the IMF. Later, 'Sweden's reserve position at the IMF' replaces the net quota in the Riksbank's balance sheets. (Fregert 2014) From here on, claims on international organizations is a relatively large post in the Riksbank's FX reserve.

In 1969, the item 'Special Drawing Rights to the IMF' are introduced both on the asset and the liability side of the balance sheet. The SDRs is a potential claim on the IMF, which can be freely traded for a number of currencies.¹¹ When not traded, the SDR appears as equally large on both asset and liability side as the assets are acquired without payment. In the 1980s and 1990s, Sweden used its SDR:s at several time points, during which the net SDR turned negative. (Fregert 2014)

Another institution built to mitigate international trade was the European Payment Union (EPU). Launched in September 1950, the EPU was designed to guarantee the convertibility between its member currencies at fixed rates and acted as a clearing house, settling its accounts each month. In this way, trade could be upheld without the beforehand acquisition of US dollars. The EPU was dissolved in December 1958 as currencies had become convertible and the union was no longer needed. (Wetterberg and Hort 2009) In Figure 12, the holdings in DEU, DKN, FRA, GBR and NOR are

¹¹Today: Japanese Yen, British Pound Sterling, US dollar or Euro.

shown. Other EPU currencies together with the EPU basket are found under the category 'epu_other'. After the dissolution of the EPU, the Riksbank's internal memos on the foreign reserve cease to give information about the size of the holdings of former EPU currencies. They are instead found together with the US dollar under the category 'convertible currencies'. In the graph, 'convertible_other' shows the size of all convertible currencies minus dollar holdings.

What is most eye-catching in the figure is the rise of the dollar. By the end of the Bretton Woods era in 1973, the dollar made up 96 percent of the Swedish foreign currency reserve and 76 percent of the total net FX reserve.

4.4 1973-2023

Internal memos on the FX reserve to the Riksbank board show the bank was becoming increasingly concerned over the high exposure towards the US dollar. In a 1989 report, it is explained that to lessen the risk of exchange rate movements, the Riksbank has begun to work on diversifying its portfolio. Furthermore, it is stated that the bank is underway working on a new model portfolio which after its implementation was to provide a long-run strategy for foreign investments.¹²

Introduced in 1990, the model portfolio included US dollar, Deutsche mark, Japanese yen, Dutch guilder, British pound, French franc, and the European currency unit (ECU). Based on data for the last five years, the weight of each currency was set to minimize the fluctuations of the total portfolio measured in kronor. Each currency was allowed to drift +/- five percent from its target allocation, and the weights of currencies were to be revised each year. But at the same time, the allocation should also meet the political requisite not to pursue interventions that could spur conflicts with other central banks.¹³ For instance, the Riksbank observed an outflow of Deutsche mark during financial markets turmoil in November and December 1990. Still, it chose not to sell other currencies as that would have added to tensions within the European Exchange Rate Mechanism about the relative value of the Deutsche Mark.¹⁴

Figure 14 depicts the currency diversification of the FX reserve. In the 1980s, the category "other" grows in size. Because of the structure of the COFER data - the source for this observations -, we cannot decompose this category further. However, it is safe to say that it was almost entirely made up of French franc, Deutsche mark and Dutch guilder. This is shown in an internal report on the FX reserve that was attached to the Riksbank board's minutes each year. Its numbers are shown in Table 2.

As discussed under the section on sources, the report, unfortunately, does not use the same categorizations as the balance sheet and therefore the numbers are not fully comparable to the data obtained from COFER or the data found in Figure 13. Differences are clearly visible in year 1992 when the bank's position in futures trading was at times negative. An effect of this is that US dollar and Deutsche mark together comprise more than 100 percent of the total foreign reserve. As futures are not included in the

¹²Valutareservens placering 1990, in A 1 B: Bankofullmäktiges särskilda protokoll.

¹³See for instance Valutareservens placering 1989-01-30, p. 2, in A 1 B: Bankofullmäktiges särskilda protokoll.

¹⁴Valutareservens placering 1991, p. 20, in A 1 B: Bankofullmäktiges särskilda protokoll.

formal definition of the FX reserve, this is not observed in the data reported to COFER.¹⁵ However, the reports indicates a strong presence of Deutsche mark and French franc which together typically amount to between one-third and half of the total foreign currency holdings.

By the end of 2023, the dollar was still the Riksbank's largest currency holding. But it is now accompanied by smaller positions in British pounds, Canadian dollars, Australian dollars, and Euros.

Table 2: The allocation of the Riksbank's foreign currencies, 1987-1997.

Year	US dollar	ECU	Pound sterling	French franc	Dutch guilder	Japanese yen	Swiss franc	Deutsche mark
1987	0.43		0.01		0.03	0.20	0.03	0.29
1988	0.28	0.01	0.08		0.07	0.32	0.01	0.24
1989								
1990	0.25	0.09	0.13	0.11	0.06	0.15		0.20
1991	0.25	0.02	0.13	0.12	0.04	0.16		0.21
1992	0.74	0.01	-0.05	-0.34	0.00	-0.08		0.72
1993	0.21		0.22	0.31	0.129	0.06		0.11
1994	0.22		0.24	0.20		0.09		0.26
1995	0.18		0.21	0.20		0.11		0.30
1996	0.20		0.21	0.21		0.10		0.28
1997	0.35		0.15			0.15		0.35

After almost disappearing from the Riksbank's balance sheet in the 1980s, the bank increased its gold holdings from December 1998. However, this is partly an effect of how gold has been booked by the bank in its balance sheets. Between 1973 and November 1998, gold was valued at a fixed price. When the Riksbank decided to value its gold reserve at market price, its total value increased fifteen-fold, from 909 million kronor to 13 834 million kronor. Gold did become less important as a foreign reserve in this period. But not to the extent that one might think just by looking in the balance sheets when measured in book value.

In previous research, it has been observed that central banks started to diversify their foreign reserves with smaller currencies and riskier assets. This mirrors a development where central banks' portfolio's have been managed more like the private asset management industry. (Eichengreen and Flandreau 2016) This development has been present also in Sweden. If one reads the internal memos on the Riksbank's foreign reserve from the years around 1990, one can see that the Riksbank tried to diversify its assets not only in terms of currencies, but also asset classes. For instance, a report from 1989 states that the Riksbank has begun to trade in futures and options as well as in equities in 1988.¹⁶ In 1990, external

¹⁵Valutareservens placering 1992, in A 1 B: Bankofullmäktiges särskilda protokoll.

¹⁶Valutareservens placering 1989-01-30, in A 1 B: Bankofullmäktiges särskilda protokoll.

Figure 13: Net foreign exchange reserves by item, 1973-2023.

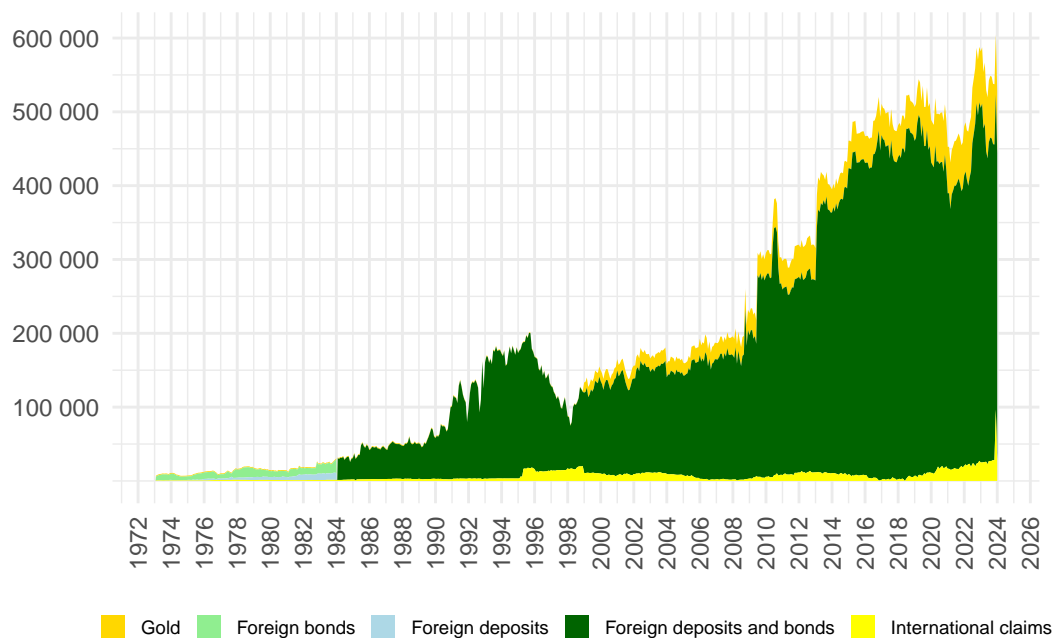
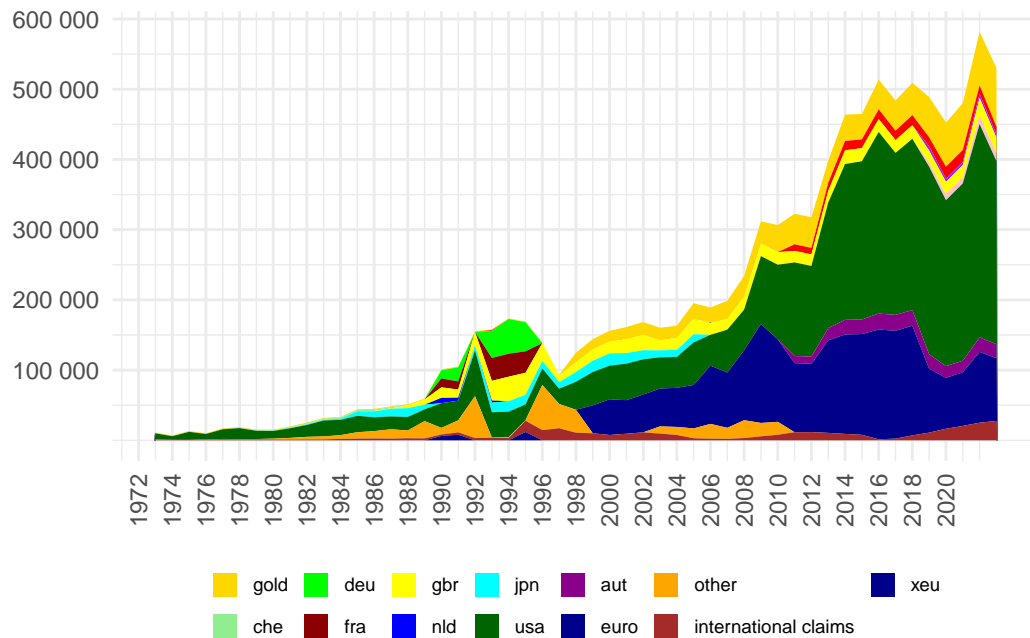


Figure 14: Net foreign exchange reserves by currency, 1973-2023.



fund brokers were hired to manage smaller foreign portfolios for the bank.¹⁷ In 1992, the Riksbank also started to invest in American housing bonds.¹⁸

The Swedish bank sector's reliance on foreign financing became evident during the financial crisis that started in 2007. In response, The Riksbank took the decision to expand its foreign reserves. This is observable in the data presented in this section. The increasing gold reserve has been accompanied by a general growth of FX assets relative to other assets.

5 Final remarks

Ferguson et al. (2023) has shown that balance sheet expansions by central banks historically have been provoked most commonly by financial distress, wars, revolutions, pandemics, and natural disasters. When summarizing the 200 years trajectory of the Riksbank's FX reserve, with detailed analyses of its compositions of items as well as currencies allocation, that assertion is confirmed. Major political and economical upheavals have historically had huge short-term effects on the size and composition of the Riksbank's assets.

To this narrative, one can also add that these major events often have paved the way for policy changes with long-run impact on the reserves. For instance, the speculation against the Pound sterling during the international financial crisis of 1931 eventually forced the Riksbank to temporarily let its currency float. And in the aftermath of the Second World War, new international organizations became not only present in the Riksbank's balance sheet, but also provided the institutional framework within which the US dollar would become the dominant foreign currency. The financial crisis of 2007-2008 led to a general increase in foreign reserves.

¹⁷*Valutareservens placering 1991*, in A 1 B: Bankofullmäktiges särskilda protokoll.

¹⁸*Valutareservens placering 1992*, in A 1 B: Bankofullmäktiges särskilda protokoll.

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Riksarkivet

G I b: Sveriges Riksbank huvudbokföringen 1668-1902. Räkenskaper, huvudböcker. Riksens ständers banks huvudbok.

Sveriges Riksbanks arkiv

A1B: Bankofullmäktiges protokoll. Bankofullmäktiges särskilda protokoll.

B4A: Riksbankens publikationer. Statistisk årsbok/Statistical Yearbook.

B4E: Riksbankens publikationer. Översikt över Riksbankens tillgångar och skulder.

F4A: Projekt, utredningar, avtal och promemorior. Valutareservens placering.

G1A: Huvudbokföring. Huvudböcker.

G2A: Bokslut.

G5: Typexemplar av räkenskapshandlingar. Riksbankens tillgångar i obligationer 1899–1927.

H13: Övrig statistik 1959-1995. Valutareservrapporter från Redovisningsavdelningen, underlag till statistik.

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How Much Information Do Monetary Policy Committees Disclose? Evidence from the FOMC's Minutes and Transcripts <i>by Mikael Apel, Marianna Blix Grimaldi and Isaiah Hull</i>	2019:381
Risk endogeneity at the lender/investor-of-last-resort <i>by Diego Caballero, André Lucas, Bernd Schwaab and Xin Zhang</i>	2019:382
Heterogeneity in Households' Expectations of Housing Prices – Evidence from Micro Data <i>by Erik Hjalmarsson and Pär Österholm</i>	2019:383
Big Broad Banks: How Does Cross-Selling A Affect Lending? <i>by Yingjie Qi</i>	2020:384
Unemployment Fluctuations and Nominal GDP Targeting <i>by Roberto Billi</i>	2020:385
FAQ: How do I extract the output gap? <i>by Fabio Canova</i>	2020:386

Drivers of consumer prices and exchange rates in small open economies <i>by Vesna Corbo and Paola Di Casola</i>	2020:387
TFP news, stock market booms and the business cycle: Revisiting the evidence with VEC models <i>by Paola Di Casola and Spyridon Sichlimiris</i>	2020:388
The costs of macroprudential deleveraging in a liquidity trap <i>by Jiaqian Chen, Daria Finocchiaro, Jesper Lindé and Karl Walentin</i>	2020:389
The Role of Money in Monetary Policy at the Lower Bound <i>by Roberto M. Billi, Ulf Söderström and Carl E. Walsh</i>	2020:390
MAJA: A two-region DSGE model for Sweden and its main trading partners <i>by Vesna Corbo and Ingvar Strid</i>	2020:391
The interaction between macroprudential and monetary policies: The cases of Norway and Sweden <i>by Jin Cao, Valeriya Dinger, Anna Grodecka-Messi, Ragnar Juelsrud and Xin Zhang</i>	2020:392
Withering Cash: Is Sweden ahead of the curve or just special? <i>by Hanna Armelius, Carl Andreas Claussen and André Reslow</i>	2020:393
Labor shortages and wage growth <i>by Erik Frohm</i>	2020:394
Macro Uncertainty and Unemployment Risk <i>by Joonseok Oh and Anna Rogantini Picco</i>	2020:395
Monetary Policy Surprises, Central Bank Information Shocks, and Economic Activity in a Small Open Economy <i>by Stefan Laséen</i>	2020:396
Econometric issues with Laubach and Williams' estimates of the natural rate of interest <i>by Daniel Buncic</i>	2020:397
Quantum Technology for Economists <i>by Isaiah Hull, Or Sattath, Eleni Diamanti and Göran Wendin</i>	2020:398
Modeling extreme events: time-varying extreme tail shape <i>by Bernd Schwaab, Xin Zhang and André Lucas</i>	2020:399
The Effects of Government Spending in the Eurozone <i>by Ricardo Duque Gabriel, Mathias Klein and Ana Sofia Pessoa</i>	2020:400
Narrative Fragmentation and the Business Cycle <i>by Christoph Bertsch, Isaiah Hull and Xin Zhang</i>	2021:401
The Liquidity of the Government Bond Market – What Impact Does Quantitative Easing Have? Evidence from Sweden <i>by Marianna Blix Grimaldi, Alberto Crosta and Dong Zhang</i>	2021:402
Five Facts about the Distributional Income Effects of Monetary Policy <i>by Niklas Amberg, Thomas Jansson, Mathias Klein and Anna Rogantini Picco</i>	2021:403
When domestic and foreign QE overlap: evidence from Sweden <i>by Paola Di Casola and Pär Stockhammar</i>	2021:404
Dynamic Macroeconomic Implications of Immigration <i>by Conny Olovsson, Karl Walentin, and Andreas Westermarck</i>	2021:405
Revisiting the Properties of Money <i>by Isaiah Hull and Or Sattath</i>	2021:406
The cost of disinflation in a small open economy vis-à-vis a closed economy <i>by Oleksandr Faryna, Magnus Jonsson and Nadiia Shapovalenko</i>	2021:407
On the Performance of Cryptocurrency Funds <i>by Daniele Bianchi and Mykola Babiak</i>	2021:408
The low-carbon transition, climate commitments and firm credit risk <i>by Sante Carbone, Margherita Giuzio, Sujit Kapadia, Johannes Sebastian Krämer, Ken Nyholm and Katia Vozian</i>	2022:409
Seemingly Irresponsible but Welfare Improving Fiscal Policy at the Lower Bound <i>by Roberto M. Billi and Carl E. Walsh</i>	2022:410
Pension Reform and Wealth Inequality: Evidence from Denmark <i>by Torben M. Andersen, Joydeep Bhattacharya, Anna Grodecka-Messi and Katja Mann</i>	2022:411

Inflation Targeting or Fiscal Activism? <i>by Roberto M. Billi</i>	2022:412
Trading volume and liquidity provision in cryptocurrency markets <i>by Daniele Bianchi, Mykola Babiak and Alexander Dickerson</i>	2022:413
DISPERSION OVER THE BUSINESS CYCLE: PASSTHROUGH, PRODUCTIVITY, AND DEMAND <i>by Mikael Carlsson, Alex Clymo and Knut-Eric Joslin</i>	2022:414
Electoral Cycles in Macroeconomic Forecasts <i>by Davide Cipullo and André Reslow</i>	2022:415
The Curious Incidence of Monetary Policy Across the Income Distribution <i>by Tobias Broer, John Kramer and Kurt Mitman</i>	2022:416
Central Bank Mandates and Monetary Policy Stances: through the Lens of Federal Reserve Speeches <i>by Christoph Bertsch, Isaiah Hull, Robin L. Lumsdaine, and Xin Zhang</i>	2022:417
The Political Costs of Austerity <i>by Ricardo Duque Gabriel, Mathias Klein and Ana Sofia Pessoa</i>	2022:418
Central bank asset purchases: Insights from quantitative easing auctions of government bonds <i>by Stefan Laséen</i>	2023:419
Greenflation? <i>by Conny Olovsson and David Vestin</i>	2023:420
Effects of foreign and domestic central bank government bond purchases in a small open economy DSGE model: Evidence from Sweden before and during the coronavirus pandemic <i>by Yildiz Akkaya, Carl-Johan Belfrage, Paola Di Casola and Ingvar Strid</i>	2023:421
Dynamic Credit Constraints: Theory and Evidence from Credit Lines* <i>by Niklas Amberg, Tor Jacobson, Vincenzo Quadrini and Anna Rogantini Picco</i>	2023:422
Stablecoins: Adoption and Fragility <i>by Christoph Bertsch</i>	2023:423
CBDC: Lesson from a Historical Experience <i>by Anna Grodecka-Messi and Xin Zhang</i>	2023:424
Do Credit Lines Provide Reliable Liquidity Insurance? Evidence from Commercial-Paper Backup Lines <i>by Niklas Amberg</i>	2023:425
Price Pass-Through Along the Supply Chain: Evidence from PPI and CPI Microdata <i>by Edvin Ahlander, Mikael Carlsson and Mathias Klein</i>	2023:426
Cash for Transactions or Store-of-Value? A comparative study on Sweden and peer countries <i>by Carl Andreas Claussen, Björn Segendorf and Franz Seitz</i>	2023:427
Fed QE and bank lending behaviour: a heterogeneity analysis of asset purchases <i>by Marianna Blix Grimaldi and Supriya Kapoor</i>	2023:428
Monetary policy in Sweden after the end of Bretton Woods <i>by Emma Bylund, Jens Iversen and Anders Vredin</i>	2023:429
Banking Without Branches <i>by Niklas Amberg and Bo Becker</i>	2024:430
Climate impact assessment of retail payment services <i>by Niklas Arvidsson, Fumi Harahap, Frauke Urban and Anissa Nurdiauwati</i>	2024:431
Four Facts about International Central Bank Communication <i>by Christoph Bertsch, Isaiah Hull, Robin L. Lumsdaine, and Xin Zhang</i>	2024:432
Optimal Monetary Policy with $r^* < 0$ <i>by Roberto Billi, Jordi Galí, and Anton Nakov</i>	2024:433
Quantitative Easing, Bond Risk Premia and the Exchange Rate in a Small Open Economy <i>by Jens H. E. Christensen and Xin Zhang</i>	2024:434
Supply-Chain Finance: An Empirical Evaluation of Supplier Outcomes <i>by Niklas Amberg, Tor Jacobson and Yingjie Qi</i>	2024:435
Optimal Contracts and Inflation Targets Revisited <i>by Torsten Persson and Guido Tabellini</i>	2024:436
Potential Climate Impact of Retail CBDC Models <i>by Niklas Arvidsson, Fumi Harahap, Frauke Urban and Anissa Nurdiauwati</i>	2024:437

Do we need firm data to understand macroeconomic dynamics? <i>by Michele Lenza and Ettore Savoia</i>	2024:438
Inflation-Dependent Exchange Rate Pass-Through in Sweden: Insights from a Logistic Smooth Transition VAR Model <i>by Gabriella Linderöth and Malte Meuller</i>	2024:439
Quantitative Easing and the Supply of Safe Assets: Evidence from International Bond Safety Premia <i>by Jens H. E. Christensen, Nikola N. Mirkov and Xin Zhang</i>	2024:440
Bank fragility and the incentives to manage risk <i>by Toni Ahnert, Christoph Bertsch, Agnese Leonello and Robert Marquez</i>	2024:441
A Traffic-Jam Theory of Growth <i>by Daria Finocchiaro and Philippe Weil</i>	2024:442
Intertemporal MPC and Shock Size <i>by Tullio Jappelli, Ettore Savoia and Alessandro Sciacchetti</i>	2024:443
Plundered or profitably pumped-up? The effects of private equity takeover <i>by Anders Kärnå and Samantha Myers</i>	2024:444
Measuring Riksbank Monetary Policy: Shocks and Macroeconomic Transmission <i>by Jakob Almerud, Dominika Krygier, Henrik Lundvall and Mambuna Njie</i>	2024:445
Joint extreme Value-at-Risk and Expected Shortfall dynamics with a single integrated tail shape parameter <i>by Enzo D'Innocenzo, André Lucas, Bernd Schwaab and Xin Zhang</i>	2025:446
The Inflationary Effects of Quantitative Easing <i>by Mathias Klein and Xin Zhang</i>	2025:447
Shadow banks or just not banks? Growth of the Swedish non-bank sector <i>by Jieying Li and Samantha Myers</i>	2025:448



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