

Swedish Riksbank Notes and Enskilda Bank Notes: Lessons for Digital Currencies*

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1 Introduction

In a series of papers we have examined the experiences of Canada and the United States with notes issued by private banks and notes issued by either a country's government or its central bank.¹ The reason for undertaking these examinations is that these notes share the essential characteristics of the digital currencies, which we define to be: monetary value *stored* electronically that is accepted as a means of payment and whose use is neither based on nor requires funds in a deposit or credit account in a financial institution or central bank.² Thus, the examination of the experiences with such notes can suggest lessons for what might be expected as the use of cash declines and is replaced by other media of exchange, some of which are likely to be digital currencies.

Our examination of the experiences of Canada and the United States with these notes uncovered several regularities. One was that private bank notes were not perfectly safe in the sense that note holders were not able to redeem their notes in specie for the amounts promised on the notes at all times. In contrast, government notes were perfectly safe.

A second regularity was that private bank notes and government notes were able to coexist; e.g. both types of notes were able to circulate at the same time. The particular concern was the government notes would drive out private bank notes. The evidence showed this not to be the case.

A third regularity was that the various types of notes did not constitute a uniform currency in the sense that they did not always trade for each other at the ratios of their stated monetary denominations. Instead, we found that bank notes regularly traded at discounts outside their local area. For Canada, we also found a case where different government notes traded at discounts to each other.

Our examination of the experiences of Canada and the United States also examined the role that private entities and the two governments played with respect to these regularities. With regard to note safety, we found that government intervention could make private bank notes perfectly safe. In both countries these interventions took one of more of the following forms: (i) direct government insurance, (ii) a requirement that private issuers participate in a private insurance scheme, or (iii) giving note holders first lien and laws extending the liability of stockholders.

With regard to making private bank notes and government notes a uniform currency, we also found that there were government interventions that could accomplish this. In both countries these interventions involved establishing a clearing mechanism for notes that put the costs of clearing on the note issuer rather than the note holder.

Lastly, we found that although private bank notes are no longer in existence, their demise was due to government actions or legislation that made their issuance illegal. Their demise was not due to their being inferior to government notes as media of exchange. Rather, it was due to the idea that a monopoly on note issuance was necessary for a bank to act as a central bank.

The regularities described above pertain only to the experience of Canada and the United States. As such, they are based on a small and selective sample – two countries on the same

¹These papers are Weber (2014); Weber (2015a); Weber (2015b) and Fung, Hendry, and Weber (2017)

²Our definition of digital currencies differs from that of others that discuss central bank digital currencies (CBDC), Bordo and Levin (2017) are an example, because they tie CBDC to an account at the central bank.

continent with legal structures that came out of the legal traditions of the United Kingdom. Further, for most of the time period covered, approximately 1800 to 1950, both countries were either on a bimetallic gold/silver standard or on the gold standard. The question which then arises is how general might these regularities be: Do these regularities hold only for Canada and the United States and only for that time period or are they more general, holding for other countries, for longer time periods, and for different monetary standards?

This paper takes one step toward answering these questions by examining the experience of Sweden with government notes and private bank notes to determine how well the Swedish experience corresponds to that of Canada and the United States and to explore the reasons for any differences found. There are three reasons why the choice to study Sweden is a good one for beginning to answer these questions:

- (i) The time period is much longer. The first notes were issued in Sweden in 1661, whereas notes were not issued in the United States until 1784 and not in Canada until 1817.
- (ii) Government notes were in existence for a long period before private bank notes were issued. The opposite was the case in both Canada and the United States.
- (iii) Sweden was on alternating copper and silver standards from 1624 to 1776, a silver standard from 1776 to 1873, and a gold standard from 1873 to 1931.³ Thus, the Swedish experience allows exploration of how the choice of monetary standard could affect the experience with private and government notes.

The paper proceeds as follows. In Section 2, we discuss the history of the notes issued by a Swedish government bank, the Riksbank. In Section 3, we do the same for the notes of another government entity, the National Debt Office. In Section 4, we describe the experience with notes issued by private Swedish banks, the Enskilda banks. In section 5, we briefly describe the differences between the Swedish experience with bank notes and the experiences of Canada and the United States and present some explanations for why the differences occurred. Section 6 concludes with some lessons for digital currencies today.

2 The Riksbank and Riksbank Notes

The most significant government entity that issued notes in Sweden is commonly referred to as the Riksbank or more formally the Sveriges Riksbank. However, an institution with that name did not come into existence until 1867 when the name of the *Riksens Ständer Bank* was changed to Sveriges Riksbank. The *Riksens Ständer Bank* came into existence in 1668. It was continuously in operation under that name until the name change. It is for this reason that the Sveriges Riksbank is celebrating its 350th anniversary in 2018.

2.1 The Stockholms Banco, 1657 - 1664

Although the Sveriges Riksbank dates its beginning to the *Riksens Ständer Bank*, its actual beginning can be traced to an earlier bank, the Stockholms Banco. The Stockholms Banco was Sweden's first bank, and it was the first government-related entity to issue notes.

³See Edvinsson (2010c) and Edvinsson (2012) for more discussion of the monetary standards in Sweden and how they changed over time.

The royal charter for the Stockholms Banco was issued on 30 November 1656 by King Karl X Gustav to Johan Palmstruch and his company, which meant that the original charter was for a private bank. However, the charter was changed shortly after it was issued so that “one half of the Bank’s net profit would accrue to the Crown and the other half was to be divided equally between the City of Stockholm and Palmstruch’s company... [Further,] the King reserved the right to appoint bank commissioners (managers) (Wetterberg 2009, 33). Thus, the government was involved with the Stockholms Banco from its very beginning.

The Stockholms Banco opened its doors for business on 29 July 1657. Initially the bank was able to carry out its business of making loans based on the large amounts of copper deposited with it when it opened. However, a change in the mint equivalent of copper in 1660 reduced the value newly minted copper money relative to old and “clients rushed to the bank to withdraw [copper] plate money of the same kind as they had deposited earlier” (Wetterberg, 2009, 37). To overcome the shortage of money that resulted from this contraction of deposits, the bank began issuing notes in July or August of 1661.

The Stockholms Banco’s notes were novel in that they were not issued against deposits in the bank unlike the notes that had been issued previously by Italian banks. Instead, they were issued strictly on the credit of the bank, as were the notes issued by banks in Canada and the United States in the 1800s. More of the similarity between the Stockholms Banco’s notes and those of Canadian and U.S. bank notes can be seen from this translation of one of them:

That the holder of this Note of Credit has a claim upon the Bank of Stockholm, under No. 17269, for Twenty-Five Dollars Copper Money, this be hereby certified by us undersigned, Commissioners of the Bank and Accountants, as also verified through the Seal of the Bank, hereto appointed. Given in the Bank of Stockholm, An. 1663, the *4th November*. Dollars 25 Copper Money. (Signatures and Seal. Only words in italics written by hand). (Heckscher 1934, 170)

Sweden was officially on a copper standard at this time. A major difficulty with this copper standard was that copper coins were heavy and difficult to transport:

The largest coin, of 10 dollars ‘silver money’ in copper, had a weight of not less than 19.7 kilograms and been called the heaviest coin ever known. Even the most usual denomination, the ‘plate’ (*plåat*) of two dollars ‘silver money’, in 1661 weighed more than 3.2 kgs. ... and even the payment of small sums made the use of carriers and horses necessary” (Heckscher 1934, 170).

These difficulties with using copper coins as media of exchange helped the Stockholms Banco’s notes go into circulation. According to Edvinsson (2010b, 162), “Initially, the bank notes were quite popular with the public, since they were more convenient means of payment than the metal coins (in particular the heavy copper plates). There was even a small premium on the notes relative to metal coins.” The popularity of the notes is shown in Figure B.3. According to the data, which is taken from Edvinsson and Ögren (2014), the quantity of notes in circulation reached almost 2.8 million *daler kopparmynt*.⁴

⁴The units of account for the two main currencies in circulation at the time were the *daler silvermynt* (d.s.m.), which had 1 *daler* = 4 marks = 32 *öre* and the *daler kopparmynt* (d.k.m.), which also had 1 *daler*

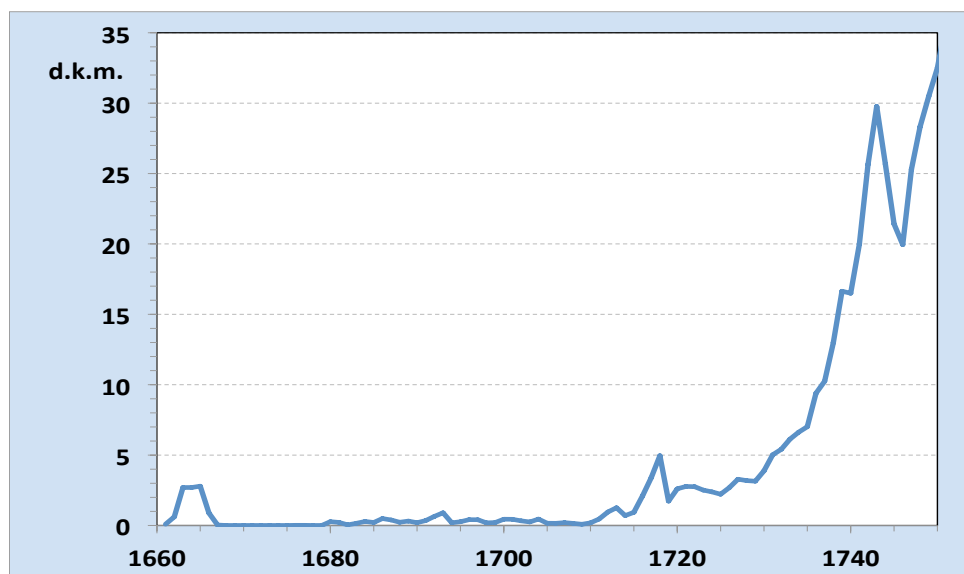


Figure 1: Quantity of RSB notes in circulation, 1660 - 1745

2.2 The *Riksens Ständer Bank*

Early years, 1668 - 1745

The Stockholms Banco did not last long. Starting in 1663, likely due to the large amount of loans made based on note issuance without a corresponding increase in its stock of copper money, the bank began to face large demands to redeem its notes in copper money. The loss of copper forced the Stockholms Banco to stop redeeming its notes in the next year. As a result, “The Riksdag (the Diet of the Estates of the Realm) decided to withdraw the notes. This was done at their full value” (Edvisson 2010b, 163). Figure B.3 shows that the quantity of notes fell after 1665 and was zero by 1668.

The Riksdag officially took over the Stockholms Banco in the fall of 1668 and changed the name to the *Riksens Ständer Bank* (RSB), Bank of the Estates of the Realm.^{5,6} The RSB was prohibited from issuing credit notes, and Figure B.3 shows that the quantity of

= 4 marks = 32 öre. The systems started with 1 *daler* d.s.m. = 1 *daler* d.k.m. However, in 1633 the ratio was changed to 1 *daler* d.s.m. = 2 *daler* d.k.m.; in 1643, to 1 *daler* d.s.m. = 2.5 *daler* d.k.m.; and in 1665, to 1 *daler* d.s.m. = 3 *daler* d.k.m. This ratio remained until 1777.

⁵The four estates were the Nobility, the Clergy, the Burghers, and the Peasants. The four estates met in the Riksdag, the Diet or parliament. The other parts of the Swedish government at the time were the king and the Council of the Realm. Thus, even though both the Stockholms Banco and the RSB were heavily involved with the Swedish government, there was a marked difference between them. The Stockholms Banco was tied to the Swedish king. The RSB was run by the Riksdag, not the king.

⁶That the *Riksens Ständer Bank* grew out of the Stockholms Banco has led some historians date the beginning of the Sveriges Riksbank to the beginning of the Stockholms Banco.

notes was zero from 1668 to 1675.

However, the difficulties of exchanging with copper coin led the RSB to find ways around this prohibition. One was the use of “approved assignments” (*approberade assignationer*). The second were “transfer notes,” which began to be issued by the Bank around 1701.⁷ The notes differed by the way in which they were obtained from the Bank and by the requirement that transfer notes had to have the signature of the person to whom they were given.⁸

Nonetheless, the quantity of notes in circulation remained small (less than 1 million d.k.m.) and relatively constant until around 1720, when the quantity increased. Note growth started increasing beginning around 1730. According to Wetterberg (2009, 88), the reasons for the increase in the quantity of notes were

In 1726, transfer notes became legal tender in the collection of revenue, which meant that people could use them to pay taxes and other public dues. Four years earlier, the bank ...decided to lower the minimum amount for a transfer note to 50 *d km*, a sixth of the minimum of 100 *d sm* that had been set in 1701.

Fiat money, 1745 - 1776

The growth of notes issued by the RSB continued until 1743, when it reached close to 30 million d.s.m. The large increase in notes outstanding in the early 1740s was due to a war with Russia. However, the value of the bank’s notes in terms of silver fell in the early 1740s. This led to a large demand for note redemption as shown by the decline in note circulation after 1743 in Figure B.3. The loss of metal reserves led the bank to stop redemptions beginning 23 October 1745.

However, as Figure 2 shows stopping redemptions did not mean that the RSB stopped issuing notes. The quantity of RSB notes exceeded the quantity of coin beginning in 1757 and remained larger throughout the remainder of the period. Thus, for a period of almost 20 years Sweden’s media of exchange were more fiat money than commodity money.

Resumption and a change in the Swedish monetary system, 1777

The year 1777 marked a major change in the Swedish monetary system in two regards. The first change was that the two old accounting systems with the *daler/mark/silvermynt* and *daler/mark/kopparmynt* as denominations were replaced by a single system with the *riksdaler* (sometimes also referred to as the *riksdaler specie*) as the main currency unit. The *riksdaler* was divided into 48 *skillings*.

The second major change was that the notes of the RSB were once again made convertible. However, the conversion was not at the old exchange rate of 1 *riksdaler* = 36 marks *kopparmynt* (k.m.). Instead, it was done at the rate of 1 *riksdaler* = 72 marks *kopparmynt*. Thus, note holders lost 50 percent of the value of their notes in terms of the unit of account. They also lost in terms of value. The *riksdaler* was trading at 40 marks k.m. per *Hamburger*

⁷Edvisson and Ögren (2014, 301) refer to these notes as “transportation notes” and state that they resembled cashier’s checks more than bank notes of today.

⁸See Wetterberg (2009, 58) for a discussion of approved assignments.

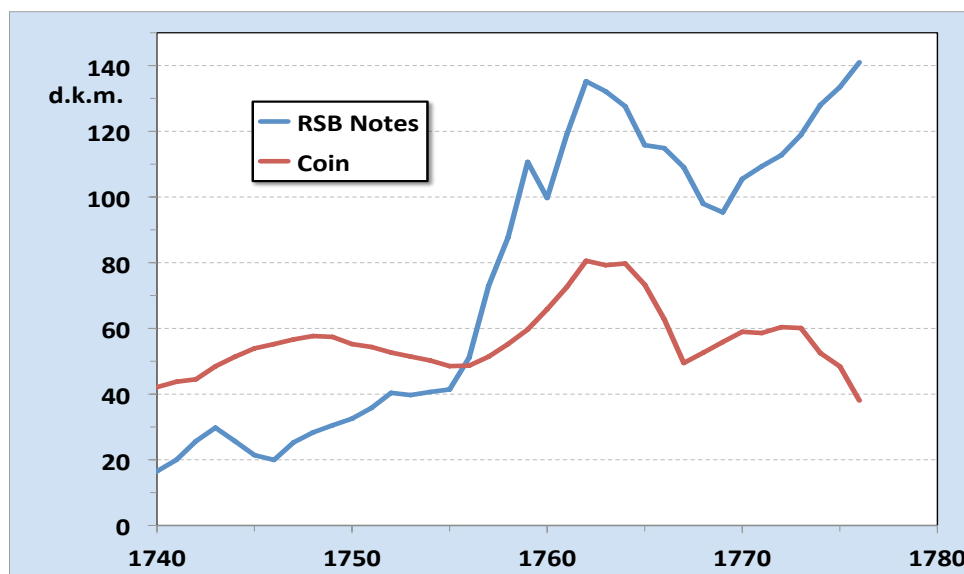


Figure 2: Quantity of RSB notes and coin in circulation, 1740 - 1776

reichtaler banco in 1745 before the RSB stopped withdrawals. At the end of 1776, that rate was around 69 marks k.m.⁹

Fiat money again, 1809 - 1834

Figure 3 shows that there was a huge increase in total bank notes beginning from 1808 to 1809. The increase was necessitated by Russia's attack on Finland in 1808. Finland was a part of Sweden at the time. The increase in notes led to a drain on the RSB's silver reserves. As a result, the RSB imposed a limited suspension of convertibility of its notes beginning in 1809. A total suspension of convertibility began in 1818.

Heckscher (1934) summarizes the monetary history of Sweden from 1745 to 1834 as "Sweden then [in 1834] had had a system of paper money since 1745, with interruptions only during the periods 1777-89 and 1803-07, almost a record in the existence of a non-metallic currency." (Heckscher (1934, 185))

Resumption until the name change, 1834 - 1867

The RSB resumed payments on its notes in 1834. However, once again there was a depreciation. The old rates were 1 *riksdaler specie* = 1 *riksdaler banco* = 48 *skillings*. The new rate was *riksdaler specie* = $\frac{8}{3}$ *riksdaler banco* = 128 *skillings*, which translates to a 62.5 percent depreciation.

⁹These exchange rates are from Edvinsson (2010a, Table 5.6). The exchange rates of the *riksdaler* against the *Amsterdam rijksdaalder courant* and the pound sterling show the same amount of depreciation of the currency over this period.

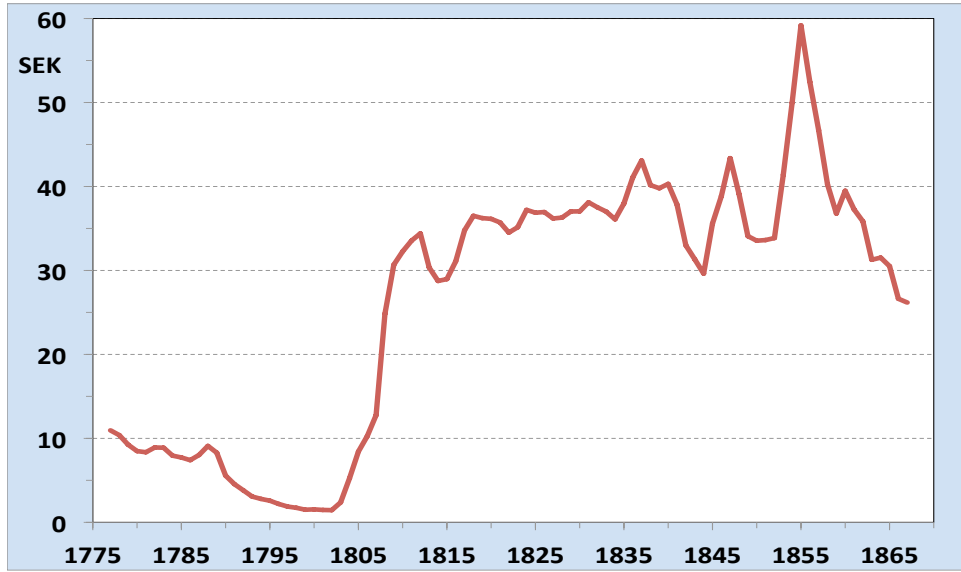


Figure 3: RSB notes in circulation, 1776 - 1867 in SEK¹⁰

2.3 The *Sveriges Riksbank*, 1867 -

The name of the *Riksens Ständer Bank* was changed to *Sveriges Riksbank* in 1867. However, no major change in its note issuance or in Sweden's monetary standard accompanied that change. The major change occurred in 1873 when Sweden adopted the gold standard and established the *krona* as the new monetary unit. The *krona* was set equal to $\frac{1}{2480}$ kilograms of gold, and the notes of the *Sveriges Riksbank* were made payable in gold. The exchange rate between the *krona* and the *riksdaler banco* was set so that holders of old notes did not lose in the transition.

Another change that occurred during this period is that the *Sveriges Riksbank* was given the monopoly on note issuance by the Riksbank Act of 1897. The monopoly formally began in 1903.

3 National Debt Office (NDO), 1789 - 1803

The need to finance another war, this one with Russia again, led the government to establish a second government note-issuing entity in 1789. This entity was the National Debt Office (*Riksgäldskontoret*).

The first NDO notes were issued in 1789. The notes issued by the NDO were inconvertible, unlike the notes issued by the RSB, which remained convertible. As Figure 4 shows a large

¹⁰Figure 3 is based on the data in Tables 7A.2 and 7A.3 in Edvinsson and Ögren (2014). The data up to 1845 are in terms of *riksdaler banco*. They are converted to SEK using 1 *riksdaler banco* = 1.5 SEK.

quantity of these notes went into circulation up to 1803. They had the effect of almost driving RSB notes almost out of circulation. There were at several reasons for the popularity of NDO notes. One was that they were issued in smaller denominations than RSB notes. Another was that they were accepted in payment of taxes. A third was that initially they were interest-bearing. However, interest payments were discontinued in 1791.¹¹

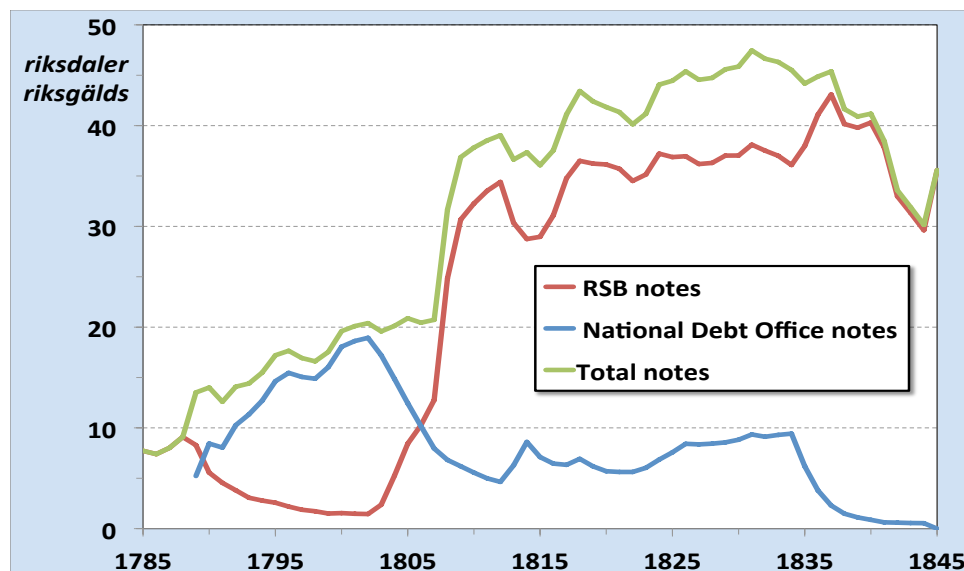


Figure 4: NDO and RSB notes in circulation, 1776 - 1845¹²

The NDO notes circulated at a floating exchange rate to the notes of the RSB. Thus, during this period there were three units of account: the *riksdaler specie*, which referred to the silver coin; the *riksdaler banco*, which referred to RSB notes; and the *riksdaler riksgälds*, which referred to the NDO notes. RSB notes circulated at a premium to NDO notes presumably because they were convertible. These premia between 1789 and 1805 are shown in Figure 5. The Figure shows that the premia were around 10 percent until 1797 when they showed a marked increase. The reasons are unclear, but the decline may have been due to economic problems Sweden was experiencing at the time.

The float between NDO notes and RSB notes ended in 1803 when NDO notes were made convertible to RSB notes at the rate of 1 *riksdaler banco* = 1.5 *riksdaler riksgälds*.¹³ According to Fregert (2012, 57), “This implied a devaluation rate of the *Riksdaler riksgäld* notes at 50 percent relative to the initial promise in 1788 at one to one.” Figure 4 also shows that after this announced rate of conversion, the relative circulation of the two types of notes

¹¹See Wetterberg (2009, 130).

¹²Figure 4 based on the data in Table A7.2 in Edvinsson and Ögren (2014). RSB notes converted to *riksdaler riksgälds* using 1 *riksdaler banco* = 1.5 *riksdaler riksgälds*

¹³Edvinsson (2010c, 47).

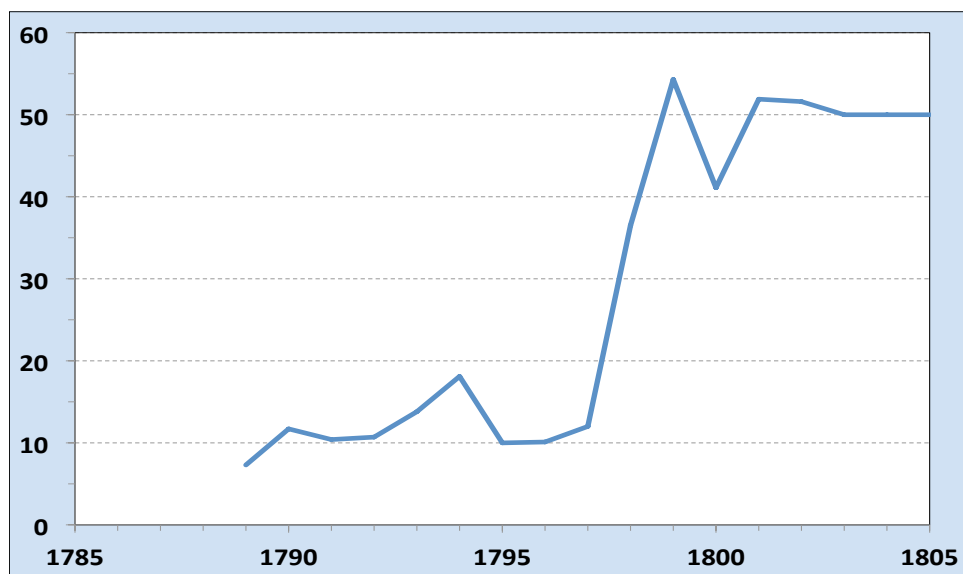


Figure 5: Premium on RSB notes over NDO notes, 1789 - 1805

reversed, with RSB notes becoming predominant. However, some NDO notes remained in circulation, presumably because they were issued in smaller denominations than the RSB notes. NDO notes eventually were taken out of circulation in 1845.

4 Enskilda Banks, 1824 - 1903

Private banks (Enskilda banks) were not authorized in Sweden until the royal proclamation of 1824, and the first private bank, the Skånska Privatbank (later *Skånes Enskilda Bank*) located in Ystad, opened for business on 5 April 1831. A second Enskilda bank, the Wermlands Provincial bank, opened in 1833. As Figure 6 shows, four more Enskilda banks were chartered between 1835 and 1837. However, no new Enskilda banks opened again until 1846. There was burst of new Enskilda bank openings between 1864 and 1866 when 13 new banks opened. By 1875, 26 Enskilda banks were in operation. The number of Enskilda banks in operation remained almost constant over the next 30 years.

The *Skånes Enskilda Bank* immediately began to issue small denomination non-interest bearing certificates payable to bearer “that for all practical purposes were identical to bank notes.... The note issuing activity ... was clearly illegal.... Still, the government did not stop the notes of the Ystad bank” (Jonung, 2007, 7-8).¹⁴ The Stora Kopparbergs Läns

¹⁴Jonung explains the statement that the issue of notes by the *Skånes Enskilda Bank* was illegal by arguing that “the proclamation of 1824 did not mention the issuance of private notes.” and that “other laws clearly prohibited the supply of private notes.” (Jonung, 2007, 6).

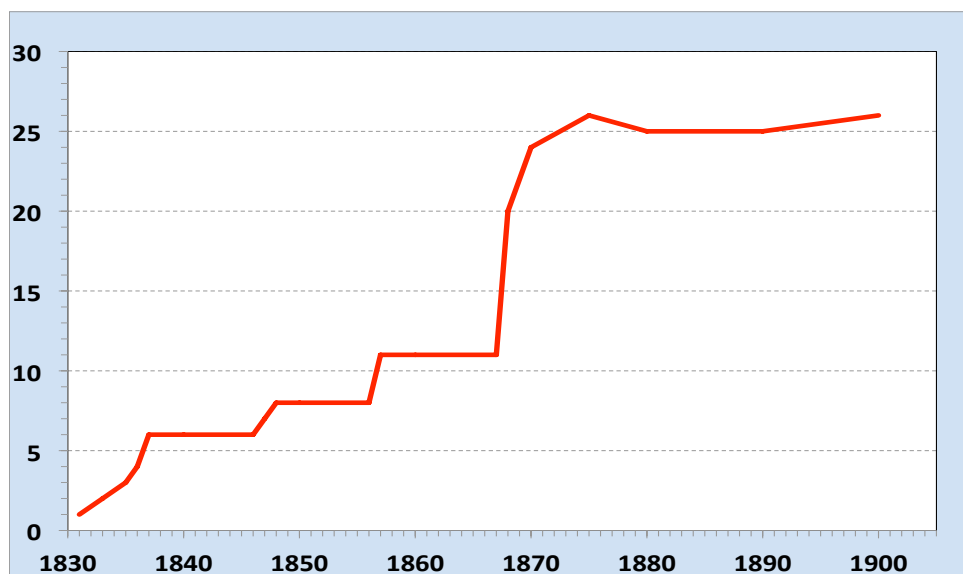


Figure 6: Number of Enskilda banks in operation over 1831-1903

och Bergslands Enskilda Bank, which opened in 1835, was the first Enskilda bank that was licensed to issue notes.

Although the proclamation of 1824 did not contain any provisions regarding bank notes, it did contain three provisions bearing on note issuance. The first was that Enskilda banks were to be “organized as a joint business partnership (*handelsbolag*) with unlimited liability” (Jonung, 2007, 5). The second was that banks should not expect to receive any government funds or government support of their activities. The third was that banks were permitted to establish branches.

The charters of the six Enskilda banks in business in the early 1840s were to expire in 1847. Before this happened, the government put forth a new law in 1846 regarding banks. It not only maintained the unlimited liability of bank shareholders, but also contained the provision that “A shareholder of the bank or his heirs was not entitled to withdraw during the term of the charter to sell his shares, unless the company gave its consent at a general meeting” (Jonung, 2007, 9). With regard to notes, it required that they be payable to bearer on demand and placed a restriction on the total amount of notes that a bank could issue based upon the sum of its vault cash, deposits at the Riksbank, and securities up to 50 percent of its capital stock. However, there was no reserve requirement against note issuance in terms of specie or RSB notes. A minimum denomination of 5 *kronor* was also set.

Some additional requirements on note issuance were made in 1855. The only ones worth noting here were the requirement that the notes of all banks were to be of the same denominations and that all notes of a particular denomination were to be of the same size.

More clarifications and changes with regard to note issuance were made with the bank

law of 1864. The first was to restrict the denominations to 5, 10, 100, and 500 *kronor*. The second was to require that notes be redeemed in coins or notes of the Riksbank if presented at the bank's principal office. If payment not made on demand, the note holder was entitled to the principal plus 6 percent interest from the time of the demand until payment was made on the note. Ögren (2003, 100) characterizes the 1864 law as “essentially permitting the free establishment of Enskilda banks. . . .”

When Sweden went on the gold standard in 1873, the redemption requirement was changed to notes had to be redeemed in gold at the principal offices. However, it is unclear whether this change had much of an effect.

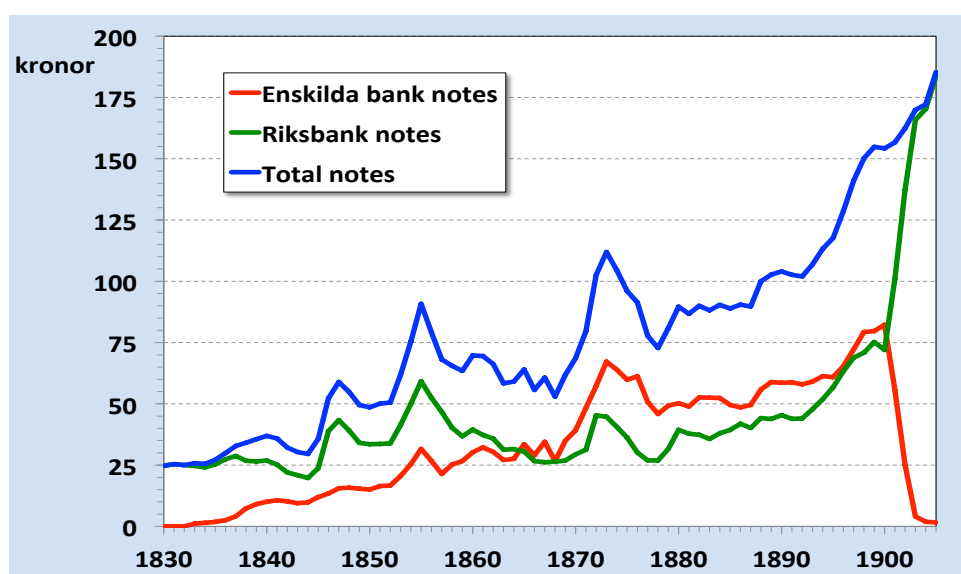


Figure 7: Enskilda, Riksbank, and total bank notes issued, 1831 - 1903

The quantity of notes issued by Enskilda banks, by the Riksbank, and the total is shown in Figure 7. Figure 8 shows that although note issuance by Enskilda banks got off to a slow start, it was an increasing fraction of the total supply of bank notes from 1831 until 1876. For the period 1865 to 1900, the notes of Enskilda banks made up over 50 percent of the total notes in the Swedish economy, with Enskilda banks' fraction of the total reaching a maximum of almost $\frac{2}{3}$ of total notes in 1876. Both figures show the decline in the importance of Enskilda bank notes after the passage of the 1897 law giving the Riksbank the monopoly on note issuance.

5 Swedish Bank Note Experience Compared to Canada and U.S.

In our previous studies of Canada and the United States we studied three episodes of private bank notes: those issued by Canadian banks and those issued by state banks and

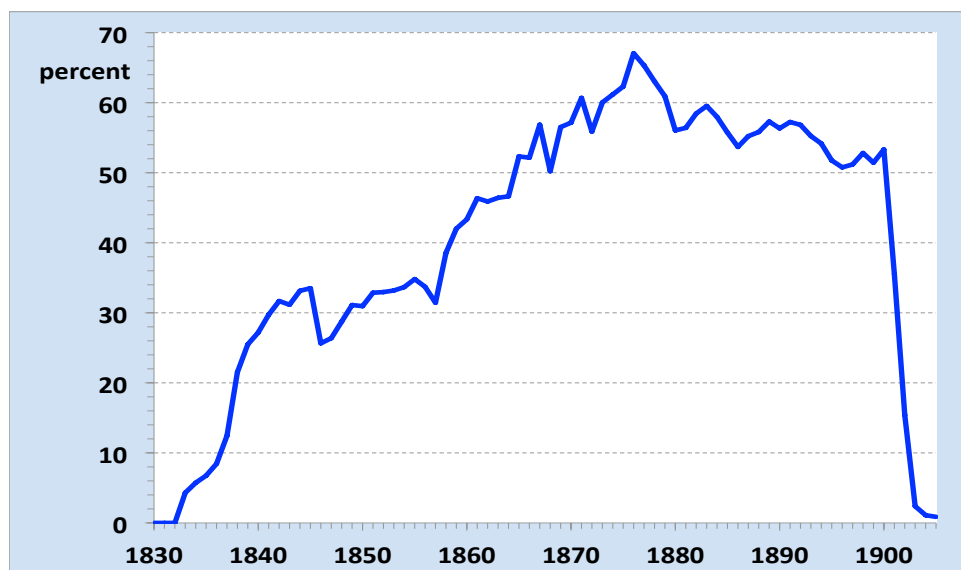


Figure 8: Enskilda bank notes as a fraction of total bank notes issued, 1831 - 1903

those issued later by national banks in the United States. We also studied two episodes of government notes: Dominion notes in Canada and Federal Reserve Notes in the United States. In this section we describe the differences between the Swedish experience with bank notes and the experiences of Canada and the United States and present some possible reasons for the why differences occurred.

5.1 Safety

Private bank notes

Enskilda bank notes were perfectly safe and no Enskilda banks failed. “During the seventy years of competition between private notes and *Riksbank* notes, none of the *enskilda* banks . . . went bankrupt, causing holders of private notes to incur losses, nor was any bank forced to close – even temporarily – due to financial panics by the public on banks” (Jonung, 2007, 23).

The Swedish experience with Enskilda bank notes differed from the experience of Canada prior to 1881 and the United States with state bank notes. Notes issued by Canadian banks prior to 1881 and by state banks in the United States were not safe. Some banks failed and the holders of their notes suffered losses. Further, in both cases, there were times during which banks suspended note redemption. During such times note holders could only trade notes for specie at a discount.

However, the Swedish experience with Enskilda bank notes was similar to that of Canada after 1881 and that of the United States with notes issued by national banks. Holders of

Canadian bank notes did not suffer losses after 1881 and holders of U.S. national bank notes did not suffer losses during the time that these notes circulated. Further, there were no suspensions of note redemption in either of these cases.¹⁵

The safety notes issued by national banks in the United States was achieved by direct government intervention. The notes of national banks were insured by the United States government.

The safety of notes issued by Canadian banks was achieved by legislation. Shareholders of Canadian banks were subject to double liability and note holders were given first lien on the bank's assets. This was done in 1881. To us, it appears that both double liability and first lien were necessary because before 1881, when there was only double liability, there were losses to note holders. First lien is necessary because without it, note holders have no higher place in line than other creditors, so that a failed bank's assets are distributed equally among all creditors.

A direct intervention by the Canadian government also may have contributed to note safety. Beginning in 1890 banks were required to contribute to the Bank Note Redemption Fund. This fund was not government insurance. There was no guarantee that the government would step in if the Fund were to be unable to fully meet its obligations. Although this possibility was recognized, according to Breckenridge (1894, 260), it was thought by the legislature that, "The experience of twenty-three years showed the improbability of one of the overwhelming banking catastrophes, without which a long impairment of the fund would be impossible." We equivocate about the Bank Note Redemption Fund's contribution to note safety because it was never used.

The Swedish experience would seem to indicate that direct government intervention in the form of some kind of insurance is not necessary to insure safety of private notes. Direct intervention to protect Enskilda note holders was explicitly ruled out. The various acts regarding Enskilda banks stated that banks should not expect to receive any government funds or government support of their activities. Instead, the Swedish experience plus that of Canada suggests that legislation in the form of extended liability of shareholders and first lien would be sufficient to achieve bank note safety.

Such a conclusion would not be correct, however. Enskilda banks, in fact, did receive direct government support on two occasions. The first was during the crisis of 1856/1857. In December 1857, the *Skånes Enskilda Bank* threatened to suspend payment on its notes, which would have caused losses to note holders during the period of suspension. The Riksbank responded by offering it a credit of 500,000 krona. In addition, the Riksbank took out a loan in Hamburg that could provide emergency credit to Enskilda banks. The second occasion was during the crisis of 1878/1879. Some Enskilda banks, the Stockholms Enskilda Bank in particular, held large amounts of railroad bonds. Beginning in 1875, the prices of railroad bonds fell by more than half their value, which led to doubts about the solvency of some banks. In this crisis, the government set up the Railroad Mortgage Fund in May 1879 to provide banks with discounts based on railway bonds. According to Ögren (2003, 261), the Fund, acting like a lender of last resort, "unquestionably was significant in saving one important bank, Stockholm Enskilda Bank, from bankruptcy."

¹⁵The suspensions of payments during the national banking period in the United States were suspensions of redemption on deposits. Notes continued to be redeemed.

Thus, our conclusion is that the Swedish experience adds support to our previous conclusion that private bank note safety required some type of direct government intervention.

Government bank notes

The notes issued by the *Riksbens Ständer Bank* were not safe. There were two instances when it suspended payments and note holders suffered losses when it resumed. Also, when the notes of the National Debt Office were made convertible into *Riksbens Ständer Bank* notes, it was done at a loss compared to what was expected when they were originally issued. Thus, the Swedish experience is differed from that of the Canada with Dominion notes and the United States with Federal Reserve Notes. Both were perfectly safe. Note holders never suffered losses.

5.2 Uniformity

Private bank notes

Although Enskilda bank notes did not start out as a uniform currency, they became one over time:

The first private [Enskilda] banks did not always accept the notes of other private banks at par. Gradually, however, they agreed to redeem each other's notes on demand at par. Furthermore, the note exchangers of the private banks exchanged the notes of other private banks. In this way, the *enskilda* banks maintained collectively the full convertibility of their notes. This system developed spontaneously. (Jonung, 2007, 19)

Ögren (2003, 152) dates this system of Enskilda banks accepting the notes of other banks at par “back at least to the legislation of 1846.” He also states that in 1856 the Stockholms Enskilda Bank established a clearing system for Enskilda bank notes.¹⁶

In contrast, notes issued by state banks in the United States were not a uniform currency. Notes of nonlocal (the term at the time was “foreign”) banks were almost always discounted. Notes issued by Canadian banks were also not a uniform currency until 1890.

The notes issued by Canadian banks after 1890 and national banks in the United States, however, were a uniform currency, exchanging at their face value in all locations. In both cases, a form of government intervention was required to achieve uniformity. In Canada, it was the government imposed requirement that banks establish either a redemption office or make an arrangement with another bank for their notes to be redeemed in specie in the country's commercial centers. Without this government intervention it is likely that the discounting of nonlocal notes would have continued. In the case of national banks in the United States, it was the establishment of a facility where a national bank could send the notes of other national banks and receive the par value in specie in return. Without this facility it is likely that national banks would have discounted or even not accepted the notes

¹⁶ “When A.O. Wallenberg founded Stockholms Enskilda Bank, one of his principal ideas was to relieve banks of this constraint [of having to make transfers between them in Riksbank notes and coins]. His bank would assist its provincial cousins by settling the mutual claims, arranging their customers' distant payments and meeting the need to exchange notes for other notes as well as with the national currency” (Wetterberg, 2003, 197).

of other banks, because notes of other national banks did not count as reserves against deposits.

The experience with bank notes in Sweden differs from that of Canada and the United States in there was no government intervention, no government mandate or facility, that led to uniformity. Enskilda banks voluntarily, at least after 1846, accepted the notes of other Enskilda banks at par.¹⁷

A plausible reason for the difference between the Swedish experience and that of Canada and the U.S., implicit in Jonung (2007), is that accepting the notes of other banks at par was a way for Enskilda banks to promote the circulation of their notes to compete with Riksbank notes. When Canadian and U.S. banks began to issue notes, they did not have to compete with government notes, as there were none. In contrast, when the first Enskilda banks began operating Riksbank notes were the predominant medium of exchange. Thus, they had to take measures to help make their notes competitive with Riksbank notes. Accepting the notes of other banks at par may have helped Enskilda banks through a network effects externality. If Bank A accepts the notes of Bank B at par and Bank B does the same, then people might see the notes of both banks as more acceptable, increasing the competitiveness of the notes of both against government notes.

Getting their notes into circulation was important for the Enskilda banks' business model because notes, rather than deposits, were the way in which their customers would have preferred to receive loans. According to Ögren (2003, 144), "Since the offices of commercial banks were both few and seldom open, bank notes were vastly more convenient for transactions than were deposits." In addition, such a mutual agreement might have meant that banks could keep their notes in circulation longer, which would increase their profitability.

There is one common characteristic of the mechanisms that led to bank notes in Canadian bank notes and national bank notes in the United States to be exchanged at par. In both cases, the redemption costs in the mechanism were borne by the note issuers rather than the note holders. The reason this characteristic is important is that when the redemption costs are borne by the holder of a note, the potential recipient of a note will discount the note to price in the redemption costs.

In the case of notes issued by Canadian banks, it was the banks that had to bear the cost of maintaining redemption facilities for their notes in the major commercial centers. In the case of notes issued by national banks in the United States, the cost of the redemption facility was allocated to banks based on the quantity of their notes that were presented for redemption.¹⁸

¹⁷In our studies we have encountered only one other case of a private system that led to uniformity. This was the Suffolk Banking System, which operated in New England and was a clearing system solely for notes of state banks in that region. While the Suffolk Banking System was in operation, notes of participating banks went at par. The Suffolk Banking System and the Swedish system differed in that, at least until 1857, the Swedish system worked without any single bank acting as the central clearing agent. We say "at least until 1857 because the Stockholms Enskilda Bank began to act as a central note clearer around near that point. The agreement to accept other Enskilda banks' notes appears to have been implicit and to have developed "spontaneously" (Jonung 2007, 19). In contrast, the Suffolk Banking System had the Suffolk Bank as the central clearer that ran it.

¹⁸The Suffolk Banking System, referenced in footnote 17, also had note issuers rather than note holders bear the cost of the redemption. In the Suffolk Banking System, member banks had to maintain a non-interest bearing deposit of specie with the Suffolk Bank.

The voluntary system of Enskilda banks also shared this characteristic to some extent:

The Enskilda banks were willing to bear some discounts costs in order to make their notes closer substitutes for Riksbank notes. In order to assure holders of the convertibility bank notes into legal tender, the exchange agents were compensated in positive relation to the quantity of the bank's notes that they exchanged for legal tender. Furthermore, in at least some parts of the Country, the Enskilda banks paid a small fee to the municipal tax authorities to act as exchange agents in connection with tax payments. Thus, despite their non-legal tender status, these notes could be used to pay taxes. (Ögren, 2003, 159)

Government bank notes

We have only two cases of issuance of distinct notes by a government. One was in Canada, when the government issued Dominion notes that were payable in Montreal and Dominion notes that were payable in Toronto. This occurred between 1868 and 1881, and although we do not have direct evidence, it appears that these notes did not trade at par in all instances.

The other case is Sweden between 1789 and 1845 when there were Riksbank notes and National Debt Office notes. The notes exchanged at a floating rate until 1803 when the National Debt Office notes, which were previously inconvertible, were made convertible.¹⁹

In both the Canadian case and the Swedish case, the different notes eventually were made uniform currencies. In the case of Canada they were literally made uniform because the specification of where the notes were payable was removed from the Dominion notes and all Dominion notes were identical. In Sweden, the mechanism was that the government established and maintained a fixed exchange rate between the Riksbank notes and the National Debt Office notes.

Enskilda bank notes and Riksbank notes also eventually became a uniform currency. Both Enskilda banks and the Riksbank took actions to make the two different types of notes a uniform currency. On the Enskilda banks side, they “maintained an exchange of one to one to *Riksbank* notes uninterruptedly as long as private notes were circulating” (Jonung, 2007, 24). On the Riksbank side, “In 1869, the Riksbank began accepting Enskilda bank notes at par, as long as these notes could be redeemed for Riksbank notes in a city where the Riksbank maintained an office” (Ögren (2003, 152)). Thus, for at least the last 30 years that Enskilda bank note were in existence, they and Riksbank notes formed a uniform currency for Sweden.

5.3 Coexistence

The evidence from Canada, Sweden, and the United States shows that private bank notes and government bank notes can coexist. In Canada, private bank notes and government notes (Dominion Notes and later Bank of Canada notes) coexisted from 1868 to 1950. In Sweden, Enskilda bank notes and Riksbank notes coexisted from 1831 to 1903. In the United States national bank notes and government notes (U.S. notes and later Federal Reserve notes) coexisted from 1863 to 1935.

¹⁹The NDO notes were to be paid out of a government “currency fund” (Wettenberg, 2009, 135).

In Canada and the U.S. the government notes were introduced to economies that already had private bank notes serving as important, perhaps even the primary, media of exchange. What the Swedish experience adds to our knowledge is that private bank notes can be introduced and become important media of exchange in economies that already have well-established government notes playing that role.

The Swedish experience further shows that private issuers have to exert effort to get their notes in circulation if there is a well-established government medium of exchange. To get their notes in circulation, Enskilda banks “displayed considerable ingenuity . . .” (Jonung, 2007, 22). One obstacle that Enskilda faced was that their notes were not legal tender for the payment of taxes and other government fees. To overcome this obstacle, Enskilda banks “supplied the proper government officials, specifically the tax collectors . . . with suitable funds of *Riksbank* notes and coins to use in exchanging private bank notes for legal tender. . . . Private banks also paid government officials to exchange private notes and to manage the exchange funds” (Jonung, 2007, 18).

An other method that Enskilda banks used to promote their notes was to offer a wide variety of low denominations:

In the 1840s they [the Enskilda banks] supplied not less than seven denominations between 3 and 15 kronor, while the *Riksbank* had only one denomination in this range. The low denomination notes were also more profitable than the higher denomination notes because the former notes tended to stay out longer in circulation (Jonung, 2007, 19).

As discussed above, the practice of Enskilda banks accepting the notes of other banks at par may also have been a method to help get their notes in circulation. *Riksbank* notes traded at par throughout the country. Having Enskilda bank notes generally trade at par would help the notes of individual Enskilda banks compete against *Riksbank* notes.

In each of these cases of coexistence of private bank notes and government notes, all of the instruments were denominated in the same national monetary units. Further, all the countries were on commodity standards at the time. We do not have historical evidence of a case in which a new private medium of exchange denominated in a different monetary unit has been successfully introduced to an economy.²⁰ Bitcoin and Ethereum are two examples of cryptocurrencies that are attempting to do this. It will be interesting to see how well they are able to do.

6 Lessons and Conclusion

Our previous studies contained some lessons for digital currencies that come from the historical experience with bank notes. The Swedish experience has led us to confirm some of these lessons and to modify others. In this section we present the modified lessons, the previous historical backing for them and how the Swedish experience has led us to confirm or modify them.

²⁰There are examples of governments introducing new media of exchange with monetary units differing from the existing ones. The introduction of the euro is a notable recent example. The euro succeeded because the ratio of the new monetary units to each of the old units was specified in advance and the new currency was supplied to holders of the old at those ratios.

Lesson 1: Digital currencies will not be safe.

We first consider fractionally-backed digital currencies. For such currencies we considered them to have been safe if they were redeemed in specie for the amounts promised on the notes at all times. The historical backing from our previous studies for a lesson about the safety of fractionally-backed digital currencies was the losses suffered by holders of private bank notes in Canada and the United States. Because of this, we limited the lesson from historical experience to being that private digital currencies. The Swedish experience with the suspensions of convertibility and depreciation once convertibility was restored of *Riksbens Ständer Bank* notes has led us to broaden this lesson to all fractionally backed digital currencies regardless of whether the issuer is a private bank or a government.

Fiat digital currencies, digital currencies that are not a liability of the issuer or issuers, will always be safe under the definition above because there is no promised redemption. To draw a lesson for such digital currencies, we draw on a result from monetary theory. This result is that an economy with a fiat currency has two potential equilibria. One in which the currency is valued and one in which it is not. Further, an economy can switch from the equilibrium in which a fiat is valued to one in which it is not. Because governments have the power to declare that their currencies be accepted in certain transactions and taxes, the non-valued equilibrium can be ruled out for their fiat currencies. However, the same is not true for tokens, fiat digital currencies that are not issued by a government, because the issuers of these digital currencies do not have such power. There is some evidence that crypto digital currencies (“tokens”) can disappear and become valueless. Of the 150 tokens with the largest marketcap at the end of 2015, six had disappeared by November 2016.²¹

Lesson 2: Digital currencies could be a uniform currency without government intervention, but they likely will not be.

After our previous studies we put forth as a lesson that digital currencies would not be a uniform currency without government intervention. Our historical backing was two empirical findings. The first finding had to do with notes issued by different Canadian banks. Notes of different banks were discounted until the government required banks to provide essentially costless redemption by requiring that all banks provide redemption facilities in the country’s commercial centers. The second empirical finding was the contrast between the experience with notes issued by state banks and those issued by national banks in the United States. Holders of notes issued by state banks had no government (or private, with the exception of the Suffolk Banking System) mechanism for costless note redemption, and notes of different banks were discounted. In contrast, holders of notes issued by national banks had such a mechanism and notes of different banks were not discounted.

The Swedish experience with Enskilda bank notes has caused us to weaken this conclusion to allow for the possibility the digital currencies could be a uniform currency without some form of government intervention. However, we think that this possibility may be quite unlikely for two reasons. The first reason is that formal private note-clearing systems were rare in times when there was no government intervention to make notes a uniform. During the period when state banks were issuing notes in the United States a private clearing system

²¹This calculation is based on information from coinmarketcap.com. We take their designation of a token as “Inactive” as meaning that token has become valueless.

only arose in New England. It did not arise in other states or regions, even though there were banks in major cities like New York or Philadelphia that could have run systems similar to the Suffolk Banking System as the Suffolk Bank did in Boston. No private system arose in Canada.

The second reason is that some of the unique features of the Swedish experience do not necessarily appear relevant for today. Note issuance was essential to the profitability of Enskilda banks' business as it was the major vehicle by which they could make loans. Usury laws prevented them from offering competitive interest rates to attract deposits. Additionally, Enskilda bank notes had to compete for circulation with already a well-established medium of exchange, the notes of the Riksbank. As Ögren (2003, 159) argues, "The Enskilda banks were willing to bear some discounts costs in order to make their notes closer substitutes for Riksbank notes." To state the point slightly differently, individual Enskilda banks may have thought there were spillover benefits in terms of the use and acceptance of their individual notes, the more generally bank notes as a whole were used and accepted by the public at large. Public acceptance would be enhanced if bank notes were a uniform currency. Another way in which Enskilda banks competed with Riksbank notes was by offering smaller denomination notes than did the Riksbank.

It is unlikely that issuance of digital currencies, expressed in terms of the national monetary units of the countries in which they are located, will be an essential part of the profitability of financial institutions that choose to issue them. Therefore, they would have no reason to promote uniformity to increase attractiveness. In fact, there are, good reasons for them to try to make their currencies more attractive, more competitive and accepted, through features, like the loyalty points offered on credit cards, which would render these digital currencies non uniform.

It is also unlikely that issuers of tokens will act to make their currencies uniform. Their competition against current accepted media of exchange can and will take other forms such as lower international transactions costs, more transparent rules for the issuance of new units of the tokens, and less reliance on trusted third parties. It does not seem likely that either Bitcoin or Ethereum, to take two popular current examples, would act to peg their currencies against each other or against the USD or CAD. It also seems unlikely that any third agent would attempt to do such pegging.

Lesson 3: Digital currencies issued by governments and private entities can coexist.

In our previous studies we used the historical experience of Canada and the United States to draw a lesson about whether government digital currencies would drive out private ones that were already in existence. Our conclusion from the historical experience in those two countries was that they would not. Government notes did not drive out existing private bank notes. Canada began issuing Provincial notes in 1866, but bank notes continued to circulate until 1 January 1950. The Federal Reserve System in the United States began issuing notes in 1914, but national bank notes continued to circulate.²²

The Swedish experience allows us to draw a lesson about the flip side of this question, which is whether private digital currencies will drive out existing government digital currencies. The conclusion from the Swedish experience is that they will not. Riksbank notes

²²See Weber (2015b).

continued to circulate after the Enskilda banks began issuing notes in 1831, although the quantity of Riksbank notes in circulation was negatively affected.

There is one concern about drawing a lesson about coexistence from the historical experience with bank notes that does not arise with the two previous lessons. It is that bank notes are printed on paper. Thus, they are physical objects, and because of this they must be issued in a finite number of denominations. Thus, with historical physical currencies there were cases in which it was possible to issue a currency that was considered to better than others, and was therefore used, because it is issued in “more useful” denominations. This possibility does not arise with digital currencies. The number of places to the right of the decimal point is only limited by the capability of computers.

Nonetheless, we think our lesson about coexistence holds for digital currencies. A government or central bank can always issue an instrument, be it physical or digital, that will circulate as a medium of exchange. This is due, at least in part, to its ability to declare such an instrument the sole instrument in which taxes can be paid. In the case of private digital currencies, technology is such that a digital instrument can carry information beyond just an amount of a currency that would make that currency better for some transactions and thus mean that could be a medium of exchange. However, the Canadian experience with Dominion notes shows that declaring government notes legal tender may not be enough to get them into widespread circulation if private notes are already a well-established medium of exchange. To help get Dominion notes in circulation, the Canadian government prohibited the issuance of small denomination bank notes.

One question that the historical experience with bank notes provides no lesson for is, Can physical and digital forms of an issuer’s medium of exchange coexist? To state it in more concrete terms, Can a paper dollar and a digital dollar issued by the Bank of Canada coexist as media of exchange or will the digital Bank of Canada dollar drive out the paper one or will the digital one not be used? The answer is probably that they can coexist because there will instances when agents want the paper dollar for anonymity or do not have access to a network to make the digital transactions even though the digital dollar will be more convenient in other transactions.

Another question worth consideration is whether countries should think about expanding the number of digits to the right of the decimal point in their monetary units. Micropayments will become a more important part of economies and unless there is a great deal of inflation the cent or the öre may be too large for the internet of things. Digital currencies will allow such micropayments far more easily than will physical currencies.

Appendix A: The Swedish monetary system²³

A.1 1624 - 1776

During this period, the Swedish monetary system had coins of three metals: copper, silver, and gold. The copper coins were of two types – small denomination (“*slantar*”) and larger denomination plates (“*plåtar*”). Silver coins in domestic circulation were also of two types – small denomination (courant) and larger denomination (carolins). An international silver coin, the *riksdaler*, was also minted as was one international gold coin, the ducat.

Along with these six coins, there were four different units of account. The two for the main currencies were the *daler silvermynt* (d.s.m.), which had 1 *daler* = 4 marks = 32 *öre* and the *daler kopparmynt* (d.k.m.), which also had 1 *daler* = 4 marks = 32 *öre*. The two other units of account that came into existence were the *daler courant* and the *daler carolin*. However, these were not as widely used as the *daler silvermynt* and *daler kopparmynt*. Note that the denomination *daler* appears in all four units of account although the systems were different, a *daler* in one was not equal to a *daler* in another.

The reason for the two main units of account was the Sweden was on a bimetallic silver and copper standard. The systems started with 1 *daler* d.s.m. = 1 *daler* d.k.m. However, in 1633 the ratio was changed to 1 *daler* d.s.m. = 2 *daler* d.k.m.; in 1643, to 1 *daler* d.s.m. = 2.5 *daler* d.k.m.; and in 1665, to 1 *daler* d.s.m. = 3 *daler* d.k.m. This ratio remained until 1777.

There were other complications with the Swedish system: the units of account were not attached to actual coins and the denomination of coins did not necessarily match their metallic content. As Edvinsson (2012, 411) puts it:

The *daler kopparmynt* and *daler silvermynt* together formed a common system of account for the main currency. Even if they were originally meant to differentiate between copper and silver coins, they became abstract units detached from actual coins, i.e. ghost monies. All coins were officially valued by these two units, although de facto a premium was in most periods paid on *riksdaler*, the ducat, and the two current silver coins.... To make it more confusing, ... some petty copper coins were minted in the denomination of *öre silvermynt*, while copper plates were always minted in the denomination of *daler silvermynt*.

Or as Klas Fregert put it in an personal email about the reform in 1665:

The copper plates were stanped with the unit daler silvermynt such that 1 dale silvermynt (dsm) was set equal to 3 daler kopparmynt (dkm). As the market value of copper to silver changed, the currency unit daler kopparmynt in effect disappeared and the effective currency units became:

- daler silvermynt in copper coins/plates
- daler silvermynt in silver coins

²³This section is based heavily on Edvinsson (2012) and a very helpful personal email from Klas Fregert.

Each of these units were equal to 3 daler kopparmynt (in copper or silver coins). Another was to put the change is: 1 daler silvermynt was nothing but the name of 3 daler kopparmynt, not itself a currency unit.

Appendix B: The Goals and Operations of the *Riksbank* and the *Riksbank*²⁴

B.1 Goals

According to Fregert (2012) the paramount goal of the RSB when it was established was to maintain the convertibility of and preserve the value of the currency. He writes, “The preamble of the Charter of 1668 stated that the goal of the Riksbank was to ‘preserve the proper and right value of the domestic money and hinder and forestall foreign monies’ increase in value’.” (Fregert 2012, 4).

Two other goals can be seen from the original organization of the *Riksbank*. The RSB was initially organized along the lines of the Bank of Amsterdam in that it had two departments. One was the loan bank (*Länebanken*), which took deposits and used them to do pure intermediation. The other was the exchange bank (*Växelbanken*), which provided the public with checking services and safe storage of coins. Deposits at the loan bank were interest-bearing; deposits at the exchange bank were non interest-bearing.

From this structure it can be seen that one of the other goals of the RSB was to intermediate debt and that a second was to provide liquidity to the economy in the form of payment services. This first goal was to be accomplished through the loan bank. The second was to be accomplished through the exchange bank, although how well the exchange bank provided liquidity services is open to question. According to Fregert (2012, 29), “The checking services provided by the exchange bank were exceedingly complicated and time-consuming and appears [sic] to have been used only to a limited extent...” The provision of liquidity services by the exchange bank did not really take place until the use notes became widespread beginning in 1726. The RSB was initially prohibited from issuing notes as discussed in the main text above.

B.2 Operations

The activities of the Riksbank (for the rest of this Appendix we will use Riksbank refer to both the *Riksbank* and the Riksbank) did not remain the same over time. The Riksbank started out behaving very much like what we would think of today as a private bank, except that it funded a large part of its lending with notes, rather than exclusively through deposits. Over time, however, it took on more of the functions and responsibilities of a central bank engaging in what could be thought of as discount window lending and open market operations. In this section we trace this evolution by looking at the balance sheets of the Riksbank as they changed over time to reflect the changes in the Riksbank’s operations.

Our division of this discussion by different time periods is motivated by the timing of changes in the Swedish monetary system’s unit of account which led to changes in the Riksbank’s reporting of its assets and liabilities. The result is that our timing is similar to but not identical to that of Fregert (2012).

²⁴The data underlying this discussion is from a spreadsheet provided to me in an email by Klas Fregert. This spreadsheet contains a detailed breakdown of the asset and liabilities items on the RSB and Riksbank balance sheet. We are deeply indebted to Klas Fregert for the data.

1668 - 1776

The early operations of the Riksbank can be seen in Figures B.1 and B.2, which show the assets and liabilities on the balance sheets of the bank from 1668 to 1776, respectively. Although superficially balance sheets might look like those of a central bank operating under a commodity standard, closer examination shows that they very look much like those of a private bank in the United States or Canada in the 1800s.

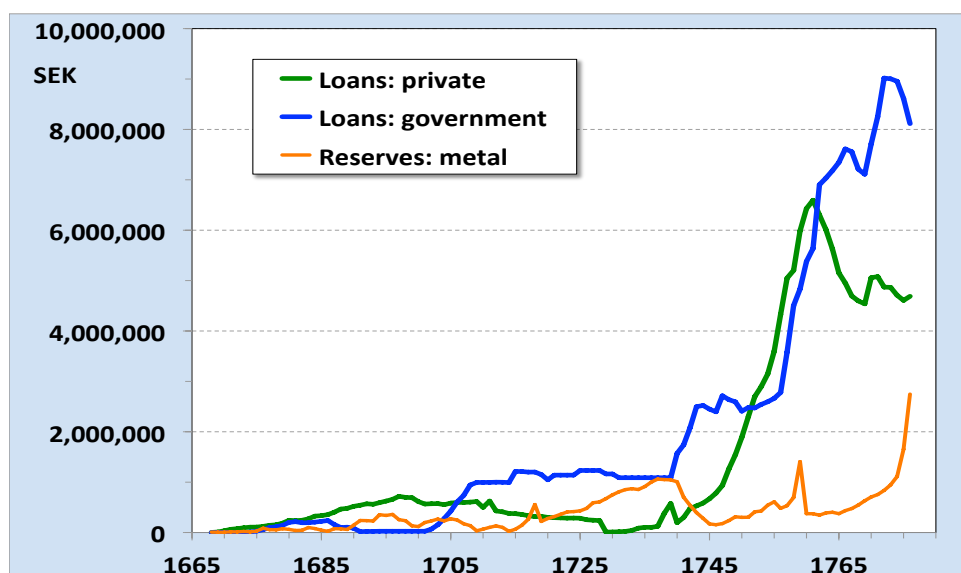


Figure B.1: Riksbank assets, 1668 - 1776

One reason for thinking these balance sheets could look like those of central bank is that note issuance makes up a large part of the Riksbank's liabilities. However, that was also true of private banks in the 1800s. Also, one might think that the deposits in the Riksbank were similar to bank reserves in central banks. However, there were no other banks in Sweden during this time, which meant that these were deposits of individuals, not banks, just as would be the case for a private bank, but would not be the case for a central bank. As a aside, Riksbank notes are greater than total deposits beginning in 1742.

The asset side of the balance sheet shows even more clearly that the Riksbank acted like a private bank. For one, the bank made direct loans to the nonbank private sector. As Figure B.3 clearly shows, the largest component of "Loans: Private" was "Loans on mortgages (*lån på fasta panter*)."²⁵ Two other categories of "Loans: Private" were "loans on other pledges (*lån på lösa panter*)" and "loans on loan bank attests (*lån på lånebankoattester*)," and they also represented direct lending to the nonbank private sector. The one component of

²⁵The figure begins in 1729 because that is the date at which consistent data become available. The data are in d.s.m. We converted to SEK using the conversion factors in Fregert's spreadsheets.

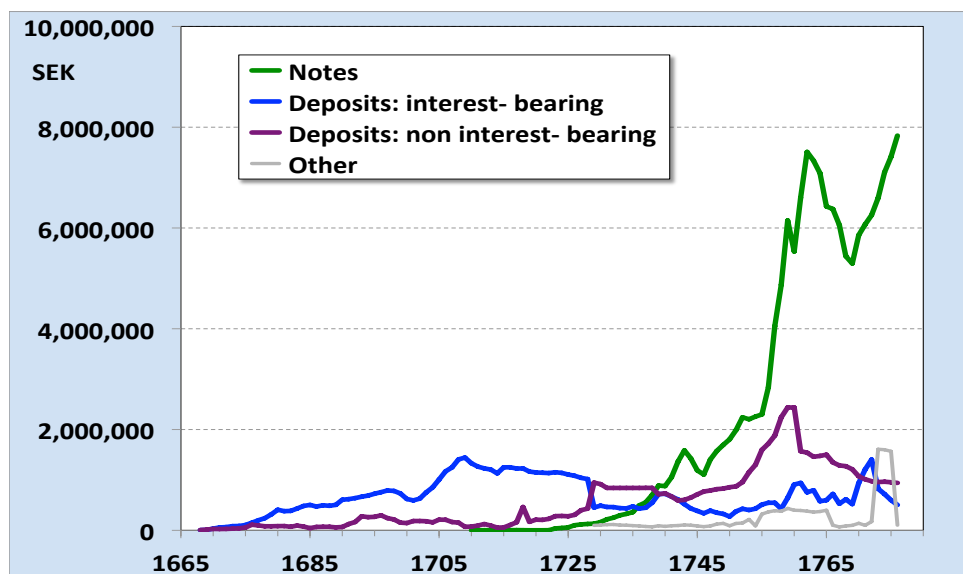


Figure B.2: Riksbank liabilities, 1668 - 1776

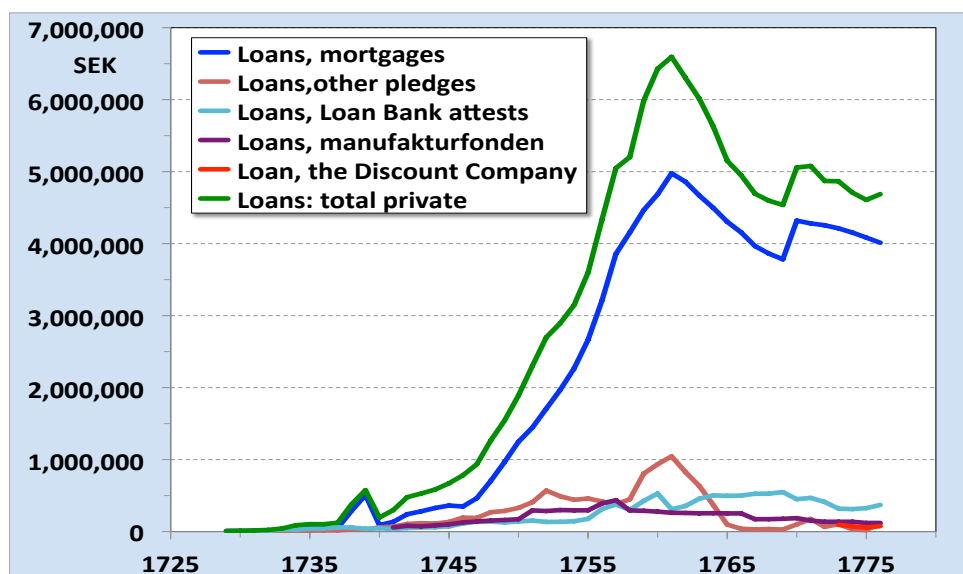


Figure B.3: Riksbank private loans by category, 1729 - 1776²⁵

private loans that might be considered central bank-like is “Loans to manufakturfonden” (*lån till Manufakturkontoret*).” However, rather than being discounted loans against collateral pledged by private financial institutions, which would be the case for a central bank, these loans were, in essence, direct lending to manufacturing. In 1741 the government set up the *Manufakturdiskonten*, a government bank under government authority *Manufakturkontoret*, which made subsidized loans to manufacturing. This balance sheet item is funds given to that authority by the Riksbank.

Another way that the balance sheets show the Riksbank acted like a private bank is the “Loans: Government.” These were not purchases of government securities, as they would be for a central bank. Rather they were direct loans to the government to finance wars. The two largest increases were for the Hats’ Russian War (1741 - 1743) and the Seven Years’ War (1756 - 1762).

The increase in metal reserves beginning around 1775 was motivated by the decision to resume convertibility of RSB notes, which occurred in 1777.

B.2 1777 - 1856

The assets and liabilities on the balance sheets of the Riksbank from 1777 to 1856 are shown in Figures B.4 and B.5, respectively. These figures appear to show that the Riksbank continued to act as a private bank as it had prior to this period. It continued to make loans made to the private sector and the government. The only major difference appears to be that the funding for the loans was now heavily from notes rather than deposits.²⁶ However, a more detailed look at the asset side of the balance sheets shows the beginning of the slow evolution that the Riksbank underwent going from operating almost exclusively like a private bank to operating like a central bank under a commodity standard.

The evolution in the operations of the Riksbank can be seen in the composition of its loans to the private sector as shown in Figure B.6. In this figure appears the category “Loans, discount companies.” Discount companies were private financial institutions that took deposits and made loans, but were prohibited from issuing notes. The first of these was the Discount Company (*Diskontkompaniet*) that was granted a royal charter and began business in 1773. The Riksbank lent to the Discount Company from the start as can be seen in the item “Loan, the Discount Company” in Figure B.3. This item first appears on the balance sheets in 1773. Other discount companies were formed in the early 1800s.²⁷ Hence the change in the designation of this category from “the Discount Company” to “discount companies.” So, at least from 1773 to 1817, the Riksbank acted as a lender to other financial institutions much as a central bank would.

We cannot be sure how much involved the Riksbank was with other financial institutions from 1817 until 1856. The reason is that all the private discount companies failed in 1817 (Fregert (2014)) and the Riksbank did not separate out loans to Enskilda banks or joint stock banks until 1978.²⁸

²⁶The increase in “Other liabilities” from 1802 to 1816 was due to the Riksbank taking over the obligations of the NDO.

²⁷One was formed in Göteborg in 1802 and a second in Malmö in 1803. See Wetterberg (2009, 1420).

²⁸The loans to discount companies category that continues on the Riksbank’s books after 1817 and are large until 1873, when the category disappears, appears to be loans to an off-balance sheet entity of the Riksbank. According to a private email from Klas Fregert, “From 1803 there was a new discount company

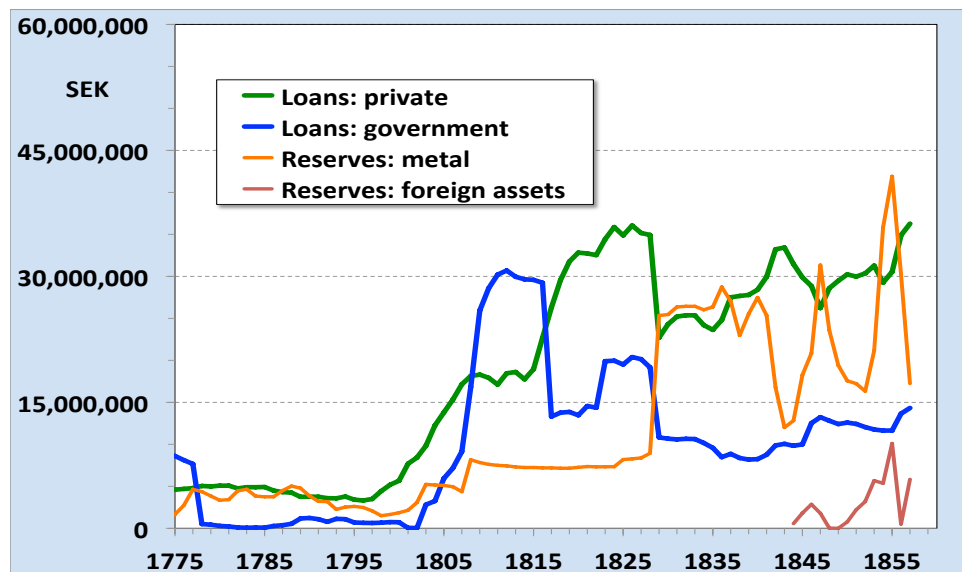


Figure B.4: Riksbank assets, 1777 - 1857

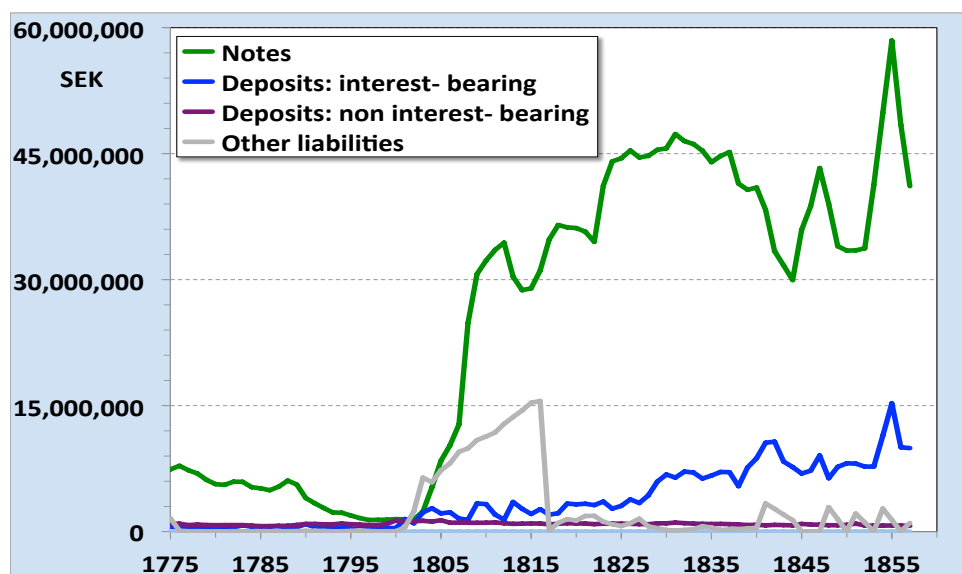


Figure B.5: Riksbank liabilities, 1777 - 1857

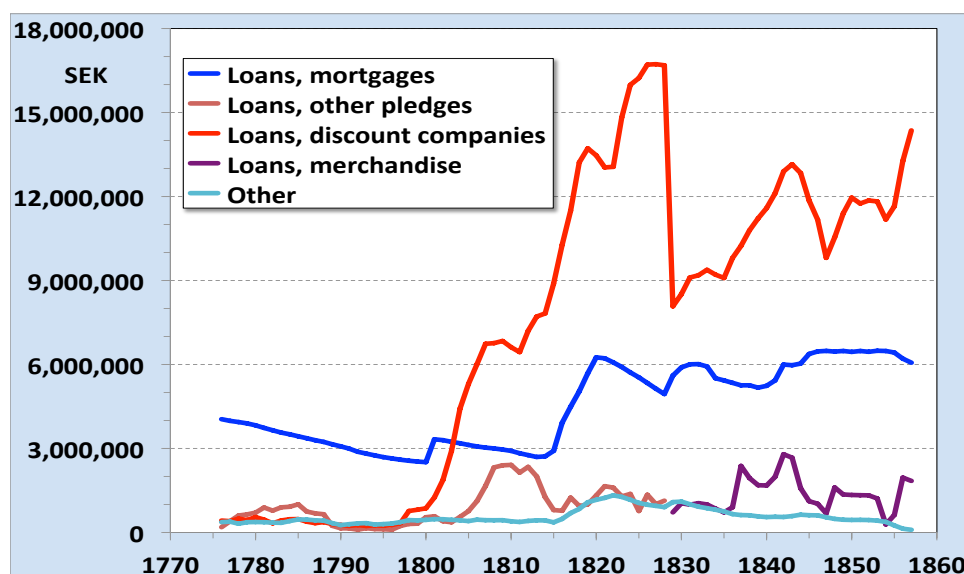


Figure B.6: Riksbank loans to the private sector by category, 1777 - 1857

B.3 1873 - 1914

The assets and liabilities on the balance sheets of the Riksbank from 1858 to 1914 are shown in Figures B.7 and B.8, respectively, and a breakdown of the private loans on the asset side of the balance sheet is shown in Figure B.9. The final stages of the evolution of the Riksbank from private bank to central bank are shown in the figures that show the Riksbank's assets. Specifics:

- (i) "Loans, government" no longer appears on the asset side of the balance sheet. Instead of making direct loans to the government as before, the Riksbank changed to buying government securities that were traded in the market, which is the practice of today's central banks.
- (ii) The Riksbank also began to purchase foreign securities. These are a large component of "Reserves: foreign assets." The purpose was to enable the Riksbank to more easily intervene in foreign exchange markets.
- (iii) Direct loans to the private sector have become a smaller part of the asset side of the balance sheet. The fall off in mortgages is an example of this. Instead, the Riksbank's

called *Riksdiskonten*, which was formed from two state-owned discount companies: *Manufakturdiskonten* and *Riksgldsdiskonten*. The new *Riksdiskonten* was half-owned by the government and half-owned by private shareholders. It became wholly owned by the Riksbank in 1815. It became *Handels och näringsdiskonten* in 1830, which was formally separated from the Riksbank until 1872, but in reality part of Riksbanken since 1815."

assets consist in large part of “Bills, payable in Sweden,” indicating that their business consisted of running a discount window as do today’s central banks.

Other developments, not shown in the balance sheets because lending to banks was not separately broken out, was the that the Riksbank lent to private banks in the crisis of 1878.²⁹

A deeper crisis [deeper than the crisis of 1873-1874] occurred in 1878. This is the first time the Riksbank actively lent to private banks to avoid a deeper depression through credit contraction and marks the beginning of the Riksbank as a modern central bank. Fregert (2012, 86)

Further, the Riksbank extended discounting rights to Enskilda banks and joint-stock banks in 1893.

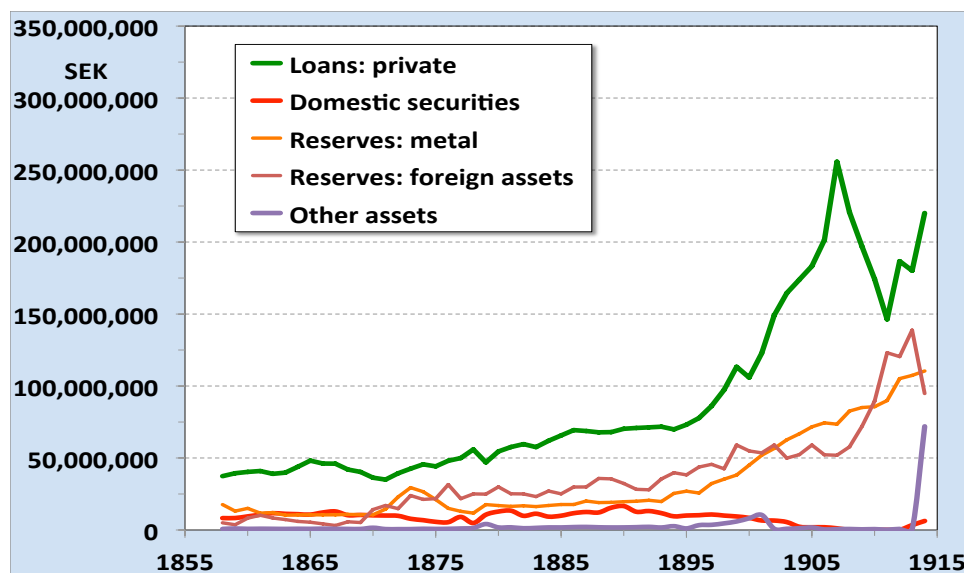


Figure B.7: Riksbank assets, 1858 - 1914

²⁹The “Credit to private banks” shown in Figure B.7 is a special credit given to note-issuing Enskilda banks when the Riksbank was given a monopoly in 1903.

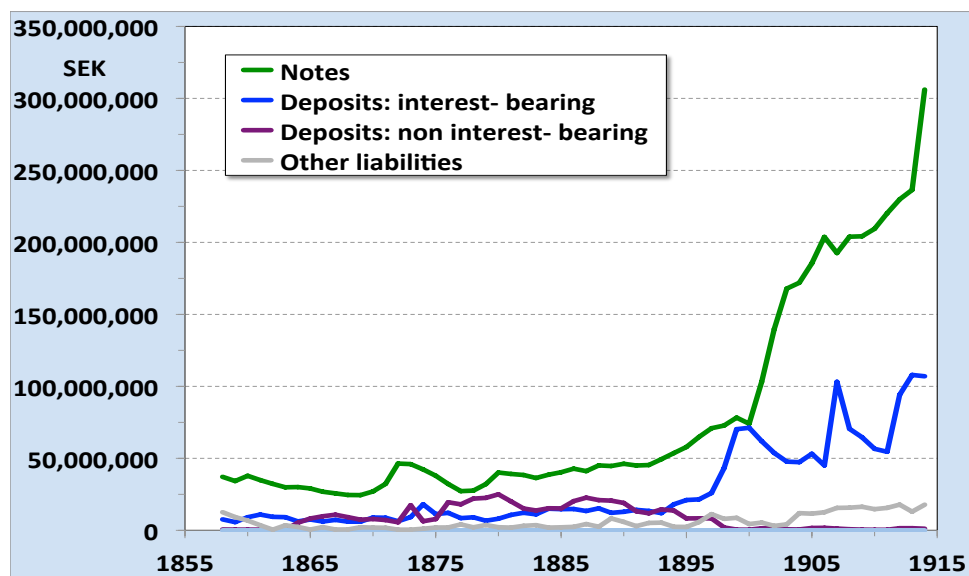


Figure B.8: Riksbank liabilities, 1858 - 1914

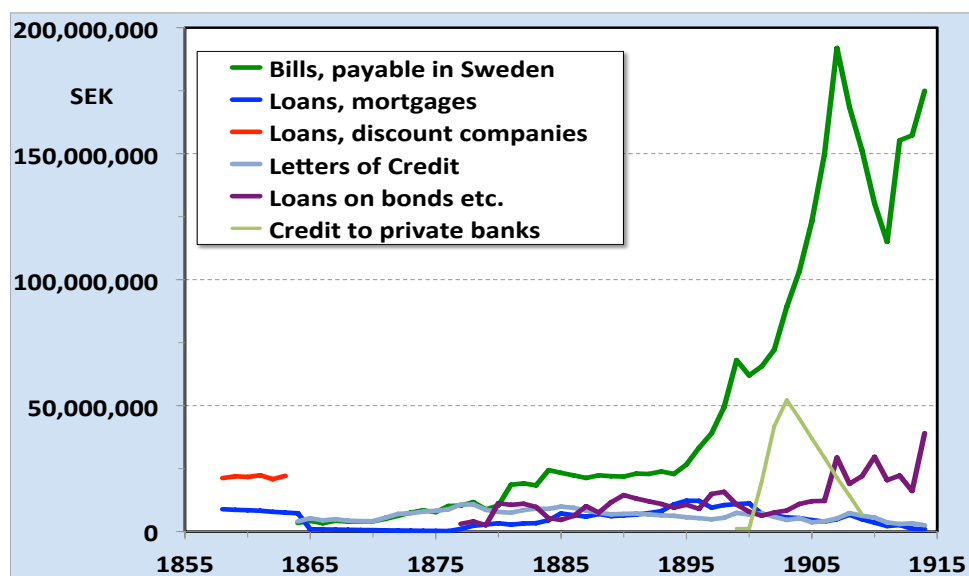


Figure B.9: Riksbank loans to the private sector by category, 1858 - 1914

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