How the German Crisis of 1931 Spread Across Europe:

Evidence from the Swedish Twin Crisis

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Abstract

The paper investigates the causes leading to the fall of the Swedish krona in late September of 1931. Contrary to the standard view that the Swedish currency fell victim to the sterling crisis of September 1931, we show that it was the German crisis of July 1931 that sealed the fate of the krona. Furthermore, the analysis of international bond markets and bank balance sheets suggests that contagion started as early as mid-May when investors reassessed the connection between the solvency of the German government, the exposure of Ivar Kreuger’s business network and two Swedish commercial banks linked to Kreuger.

1. Introduction

The German crisis was arguably the most important shock to the world economy in 1931. The fiscal crisis, the banking crisis, the Hoover moratorium, the introduction of exchange controls, and the standstill agreement – they all had repercussions in Europe and across the Atlantic, even across the Pacific. Europe’s financial and monetary order crumbled, the US dollar came under pressure, prompting the Federal Reserve to raise the discount rate in the middle of the crisis, Japan devalued its currency, and the global economy tanked even deeper. The Bank for International Settlements (BIS) spoke of “dramatic occurrences in the whole field of international finance, credit, monetary stability and capital movements, both public and private”, leading to “unparalleled world-wide disturbances.” (BIS 1931/32, p. 5)

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Yet, while there is a rich literature on the causes and the course of the German crisis, its propagation has not been fully explored yet. So far, research has concentrated on the effects of the German crisis on the British currency and the US economy, and there is no consensus on how strong contagion effectively was. Accominotti (2012) finds that the fall of sterling was ultimately caused by Germany’s introduction of exchange rate restrictions in mid-July, freezing up the acceptances of merchant banks. Billings and Capie (2011), by contrast, reject the notion that the Britain’s financial sector was not resilient enough to absorb the liquidity crisis. Ritschl and Sarferaz find a substantial negative effect emanating from the German crisis to the U.S. via the financial channel. Richardson and Van Horn (2007, 2009, 2011) believe that the New York banks successfully shielded themselves against the Central European financial crisis and that the failures of banks in the summer of 1931 were due to domestic causes.

In this paper, we investigate how Sweden was affected by the events in Germany. We think that for two reasons this research topic is helpful for a better understanding of the dynamics underlying the disruptive events of 1931. First, besides the UK, Sweden was the only creditor country that left the gold standard at an early stage of the crisis, while France and the United States as well as three small European countries waited another two to five years until they changed course. Second, the Swedish case has never been studied from a wider perspective, although its relatively small size makes it possible to make instructive comparisons with other small European countries. Understanding the Swedish case enables us to reassess the financial and monetary history of the Benelux countries, the Scandinavian countries and Switzerland during the “annus horribilis”.

The starting point of our investigation is the standard view according to which Sweden, like its Scandinavian neighbors Denmark and Norway, was only indirectly affected by the German crisis, because it did not abandon the gold standard until one week after Britain devalued sterling in September 1931. Confronted with a deepening recession and due to close trade links with the UK market, the authorities in Copenhagen, Oslo and Stockholm feared a

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2 For an overview of the research on the German crisis see Schnabel, „Twin Crisis“, and Ritschl, „Reparations“.
3 Ritschl and Sarferaz (2013).
4 We use the narrow definition of Scandinavia in which Finland, Greenland and Iceland are excluded.
sharp drop in exports, if they did not follow the devaluation of sterling. Our comparative view shows that the story was more complicated. First, the fear of a reduction of exports to the UK was relevant for the Danish authorities, but not for Norway and Sweden which were less dependent on the UK market. Conversely, Belgium and the Netherlands, two other small countries with close trade relations with the UK, did not devalue in September 1931 although their currencies were attacked. Second, there was a fundamental difference between Denmark and Norway on the one side and Sweden on the other side. While in the former cases the claim of an indirect link to the German crisis proves correct, Sweden must be considered a direct victim of the German crisis. Even before sterling went off gold, the Swedish central bank (Sveriges Riksbank) was crucially weakened. Between the end of June to end of August, the Riksbank had lost more than thirty percent of its total gold and foreign exchange reserves.

The reason for the weakness of the Riksbank prior to the fall of sterling boils down to just one name: Ivar Kreuger. The Swedish industrialist and financier was ultimately responsible for the growing distrust of foreign investors who started to withdraw their funds from the Swedish banking system in the summer of 1931. By giving a large loan to the German government in exchange for the match monopoly in 1929, he tied his fate to the solvency of the largest country of the Continent, and his further investments in 1930 and 1931 induced two Swedish commercial banks to accumulate large foreign short-term debts. When the German crisis spread across Europe following the introduction of exchange controls in mid-July of 1931, the maturity mismatch proved lethal. To cover their losses, commercial banks initiated large rediscounting operations, and, as a result, the Riksbank’s foreign short-term assets decreased at an alarming rate. By late August, the krona had become indefensible.

Thus, in a similar vein as Accominotti (2012), we emphasize the importance of the maturity mismatch within the banking system. But the chronology as well as the transmission mechanism was different, shedding new light on how the German crisis spread across Europe. For, while the London merchant banks were not affected until mid-July when Germany introduced exchange controls, the two most vulnerable Swedish banks felt the negative impact of the German crisis as early as June. At that moment, international investors were probably not aware of the large foreign short-term maturity mismatch, but simply followed their intuition that Kreuger’s involvement in Germany must have some impact on his major
creditors within the Swedish banking system. Only after Germany’s introduction of exchange controls in mid-July of 1931 did they realize that Sweden was too weak to defend its currency as the withdrawal of foreign funds translated itself into a drain of central bank reserves.

Accordingly, the Swedish case follows a different logic than the British case. Whereas the liquidity crisis of the London merchant banks was a rather mechanical process, triggered by the introduction of exchange controls in mid-July, the fall of the Swedish krona was much more driven by changing expectations of international investors prior to the full escalation of the German crisis. As early as mid-May, the quotations of the Young Loan and the 1928 Kreuger&Toll participating debenture became highly correlated, thus indicating that investors regarded the solvency of the German government as the most important information for the future of the largest debtor of the Swedish banking system. In June, a slow, but perceptible withdrawal of foreign funds from Sweden’s two largest commercial banks set in, serving as an equivalent to a downgrade that set the stage for the accelerating capital flight after mid-July. The downgrading became particularly visible in comparison to the simultaneous capital inflow to the Netherlands and Switzerland. If international investors had been more benevolent towards Kreuger’s bank creditors in Stockholm, possibly Sweden would have been on the receiving side of foreign funds seeking a safe haven after Germany introduced capital controls.

To make our case, we use narrative sources from the archive of the Swedish central bank as well as published monthly data on the Swedish banks and daily quotations of the Zurich stock exchange which listed a series of European bonds and shares, among them those of Ivar Kreuger’s international match business and the Young Loan. Both time series allow us to identify the turning points, the weaknesses of individual banks, and the contagion effects between Germany’s fiscal position, the solvency of Ivar Kreuger’s businesses as perceived by investors, and the Swedish banking system.

The remainder of the paper has four parts. Section 2 provides a short overview of how the currencies of creditor and debtor countries performed during the world economic crisis and rejects the view that Sweden’s exit from gold was entirely the result of the sterling crisis. Section 3 shows how the maturity mismatch in the balance sheets of large commercial banks
lead to a dramatic reduction of the central bank’s foreign exchange reserves between prior to the sterling crisis, and explains how the close personal connection of leading Swedish bankers, the governor of the Riksbank and Ivar Kreuger created this maturity mismatch. Section 4 reconstructs the events leading to the transmission of the German crisis to the Swedish banking system by analyzing the correlation between the Dawes plan bond, the Young plan bond, and various other international bonds listed at the Zurich stock exchange. The section also discusses the question whether or not the Swedish crisis can be called a twin crisis. The paper ends with a conclusion that summarizes the results and makes a comparison with the UK.

2. Small states and the sterling crisis

_Creditor and debtor countries in 1931_

Several studies on the 1930s have shown that creditor countries maintained the gold standard longer than debtor countries (e.g. Brown 1940, Eichengreen 1992, Wandschneider 2008, Wolf 2008, Kugler and Straumann 2010). Most debtor countries went off gold between 1929 and 1932, most creditor countries between 1933 and 1936 – namely the United States, Belgium, France, the Netherlands, and Switzerland. The only debtor countries surviving the perfect storm of 1931 were Italy as well as Poland and its two small neighbors Danzig and Lithuania. The two creditor countries leaving the gold standard as early as 1931 were Sweden and the United Kingdom. Of the two early defectors, the UK has received the most attention in recent times. By contrast, the fall of the Swedish krona has not attracted the same interest lately. Most macroeconomic studies date back to the 1930s (Kock 1931 and 1933, Kjellström 1934, Lindahl 1936, Thomas 1936). Figure 1 shows how gold and foreign exchange reserves of the seven creditor countries diverged once the world economic crisis set in. Sweden’s fate was particularly volatile. In the initial phase of the crisis, Sweden was among the countries that experienced an increase of gold

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5 Some authors classify Czechoslovakia as a creditor country. As Feinstein and Watson (1995, p. 106) point out, however, Czechoslovakia was only a net capital exporter, but remained an overall debtor. Furthermore, Czechoslovakia suspended the gold standard in September 1931 by introducing capital controls, while all creditor countries (including Belgium) used the option of devaluing their currencies.

6 The account provided by Eichengreen (1992), p. 306, is based on this contemporary research.
and foreign exchange reserves. At the end of 1930, they were 40 percent higher than at the end of 1928. Yet, within one year, they shrank dramatically. At the end of 1931, they had lost 43 percent of their value relative to the end of 1928. Even the UK which had struggled all along to defend its precarious reserve position fared better. At the end of 1931 it had lost 21 percent, only half as much as Sweden. In Sweden, something must have gone terribly wrong during the “annus terribilis”.

![Diagram showing gold and foreign exchange reserves of creditor countries](image)

**Figure 1: Gold and foreign exchange reserves of creditor countries (end of year, 1928 = 100), Source: Federal Reserve Bulletin.**

The sharp drop of reserves in 1931 is particularly surprising if we compare the Swedish economic and political situation with the British one. For, while the UK suffered from public debt, high unemployment and political uncertainty, Sweden was one of the most stable countries of Europe. It is true that the central government’s fiscal situation was deteriorating in 1931. At the end of 1930 the national debt amounted to 494.6 million kronor, at the end of
1931 to 577.6 million kronor (plus 17 percent). But as a share of GDP, this figure was not alarming at all. At the end of 1931 it stood at 21 percent of GDP, while the UK’s public debt as a share of GDP was above 150 percent.\textsuperscript{7} „From the Treasury point of view“, the Economist wrote, „Sweden is better placed.“\textsuperscript{8} It is also true that exports had rapidly declined since the first quarter of 1930. But in 1930 the current account still brought a surplus of 100 million SEK, and the 1930 GDP figures were still at the same level as the 1929 GDP figures. As the German weekly magazine Wirtschaftsdienst remarked: “So hart Schweden auch von den Schlägen der Weltkrise betroffen ist, so stellt es doch unter fast allen Ländern der Welt bisher insofern eine Ausnahme dar, als es noch keine innere Wirtschaftskrise gehabt hat. Industrie und Bankwesen sind gesund.“ (Heft 47 vom 20. November 1931, p. 1912)

Furthermore, the krona was not overvalued in the summer of 1931, while the British pound had been ever since it was made convertible to gold in 1925. There had been some real appreciation of the krona vis-à-vis the US dollar and the British pound, as the Swedish economy was hit later by the world economic crisis than both the US and the UK, putting some upward pressure on Swedish wages and prices relative to these trading partners. But, as these two markets did not account for little more than one third of total Swedish exports, the real effective exchange rate increased by only four percent from January, 1930, to June, 1931.\textsuperscript{9}

Rising unemployment was a concern in Sweden. The fall of exports led to layoffs in the industrial sector, depressing domestic demand. Rising unemployment and wage reductions also sharpened the conflict between labor and capital. In spring of 1931 a great strike broke out in a sawmill in Ådalen, a small town about one hundred kilometres northwest of Stockholm. The strike was triggered by the announcement of a drastic wage cut. When the conflict escalated, the provincial government sent troops who shot several workers during a clash.\textsuperscript{10} Furthermore, the Social Democrats (SAP) could increasingly present themselves as a viable alternative to the ruling center-right coalition. But According to Grytten (1995) who

\textsuperscript{8} Economist, 19 September 1931, p. 506.
\textsuperscript{9} Own calculations.
\textsuperscript{10} Hadenius (1990), p. 33-34.
estimated unemployment rates for all workers and not only for insured workers, Sweden’s unemployment rate was not alarming. From 1929 to 1931 it increased from 4.2 percent to 7.0 percent, while in the UK it rose from 7.5 percent to 15.1 percent. By all accounts, Sweden’s domestic position was strong relative to many other European countries.

Trade and monetary relations

If economic and political conditions were stable, the fall of the Swedish krona must have been due to a financial crisis. According to a widely held view, it was London’s suspension of the gold standard in September 1931 that sealed the fate of the Swedish currency. From this perspective, the creditor country Sweden did not differ from its neighbors Denmark and Norway which were both debtor countries. Once sterling began to depreciate, the argument goes, investors were withdrawing their funds from Northern Europe, expecting that, because of their close trade and monetary relations with the UK, the Scandinavians would soon abandon the gold standard. In that they proved right. On Tuesday morning, September 22, only two days after the British decision, Denmark prohibited the export of gold. On Sunday evening, September 27, Norway and Sweden announced the suspension of the gold standard. One day later Denmark followed.\footnote{Norway and Sweden issued their statement announcing the suspension of the gold standard on Sunday evening, September 27, Denmark on Monday evening, September 28. Denmark, however, had prohibited the export of gold on Tuesday, September 22.} In accordance with the standard view, the \textit{Economist} wrote in early October 1931 that “it was not unnatural that these three countries should be the first of our foreign neighbours to follow Great Britain’s example in suspending the gold standard.”\footnote{\textit{Economist}, October 3, 1931, p. 600. Cf. Hodne (1983), p. 70.}

This view captures essential parts of what happened in September of 1931. Yet, from a comparative perspective, it also misses crucial aspects of the story. Most importantly, Denmark, Norway, and Sweden were not the only small European countries that were forced to defend their currencies in the days following the fall of sterling. The central banks of Belgium and the Netherlands were confronted with the same mistrust that swept across financial markets because of strong trade and monetary relations with the UK. But their
currencies survived the storm. In order to understand why the Scandinavians threw in the towel, while the Belgian and the Dutch remained on the gold standard, a more systematic approach is needed.

Table 1 shows that the share of exports relative to GDP was higher for the Belgian and the Dutch economy than for the Norwegian and Swedish ones. In the case of Belgium, we also have to take into account that its main export industries – textiles, coal, iron and steel – were competing directly with British exports on third markets. Only in the case of Denmark, the standard view holds, as 60 percent of Danish exports were shipped to the UK, mainly goods for the English breakfast table: butter, eggs, and bacon. Accordingly, Denmark was the first Scandinavian country to react to Britain’s suspension of the gold standard. As mentioned, it prohibited the export of gold only two days after Britain’s announcement to suspend the gold standard.

Table 1: Exports of small European countries to UK (1928)

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports to UK in % of total</th>
<th>Exports to UK in % of GDP/NNP*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>60</td>
<td>17</td>
</tr>
<tr>
<td>Norway</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>Sweden</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Belgium**</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Netherlands</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Switzerland</td>
<td>14</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes: * GDP used for Denmark, Norway and Sweden, NNP used for Belgium, Netherlands and Switzerland.
** Belgium: figures of 1927.

The trade data also reveal that for Swedish exporters the German market was almost as important as the British one. And with respect to imports, Germany was even more relevant

than the UK: in 1928, German imports to Denmark accounted for 34 percent of total imports, to Norway for 21 percent, and to Sweden for 31 percent. Accordingly, following Britain’s devaluation meant that the three Scandinavian countries had to pay higher import prices for products from Germany, mainly coal, coke, fertilizers, chemicals and industrial products.\footnote{See Salmon (2010) and Hedberg (2010) for an overview of the literature.}

Given Belgium’s and the Netherlands’ strong dependence on the British market for their exports, investors had every reason to expect that not only the Scandinavian currencies, but also the Belgian franc and the Dutch guilder may be devalued. Only Switzerland, another small developed European country like the Scandinavian states, was not affected by the general mistrust. Between 15 September and 30 September, gold and exchange reserves of the Swiss National Bank (SNB) increased from 1893 to 2071 mio. CHF.\footnote{Ausweis der Schweizerischen Nationalbank, Archiv SNB 9.1/9004. Gerundete Werte. The SNB reduced its foreign exchange reserves from 678 to 372 mio. CHF and increased its gold reserves from 1215 to 1700 mio. CHF.} Trade data give a hint why Switzerland was spared of a speculative attack. The share of Swiss exports to the UK was considerably lower both relative to total exports and to GDP.

Some authors have suggested that a high share of sterling reserves led the Scandinavian countries to suspend the gold standard.\footnote{See for instance van Zanden (1998), p. 106.} The data do not support this view. First, in 1930 the Scandinavian countries held only slightly more sterling reserves as percent of total reserves than the members of the gold bloc.\footnote{Eichengreen and Flandreau (2009)} Second, the Belgian and the Dutch central bank also suffered from considerable losses on their sterling holdings, but they had the capacity to absorb them. In Belgium, the Board of Directors decided on Sunday night, 20 September, to convert all foreign exchange except sterling into gold, and once the Council of Regency had confirmed this decision on Monday morning, the conversion was effective within the following 24 hours. Also on Monday, the National Bank issued a press release stating that the gold cover ratio was at 67 percent, hiding the fact that the Bank was still sitting on 12.6 million of sterling. The discount rate was left at the current level in order to avoid any sign of panic. Furthermore, the commercial banks formed a consortium to intervene in the market in case of a run on the Belgian currency. It was intended that the banks should spend as much as one billion belga ($139 million), but as markets remained relatively calm, there was no need
to intervene. On Wednesday, 23 September the government and the central bank concluded an agreement which allowed the National Bank to sell its sterling reserves at the old parity to the Belgian state. Thus, on Friday, 25 September Louis Franck, the governor of the National Bank, could quietly explain on the radio that the Belgian monetary system was almost exclusively based on gold (“pratiquement, le billet de banque belge, c’est de l’or”). His speech seems to have impressed Belgian listeners as well as foreign investors. In London, the quotation of the Belgian stabilization loan immediately experienced a strong rise. The nervousness following the devaluation of sterling was abating.\(^\text{18}\)

The defence of the Dutch guilder was more protracted which makes it particularly interesting in comparison to Sweden.\(^\text{19}\) The *Economist* observed on 30 September, ten days after the devaluation of sterling, that “in some circles the view was expressed that the only thing for the Netherlands to do in the circumstances was to abandon the gold standard too, and this was already being discounted by large offerings of bonds and demands for shares”.\(^\text{20}\) In the course of its defense, the Dutch central bank had to issue public statements and to raise the discount rate from 2 to 3 percent and the lombard rate from 2.5 to 4 percent on Monday, 28 September in order to convince investors that the guilder would not be devalued. Thanks to abundant gold reserves, investors finally ended their attack on the guilder. On Tuesday, 29 September, the Dutch guilder began to recover.\(^\text{21}\)

*The decision-making process*

Taken together, neither trade relations with the UK nor sterling’s prominent position as a reserve currency fully account for the fall of the Scandinavian currencies in late September of 1931. Other factors must have played an important role in the decision-making process. A good starting point for a discussion is the protocol of the last joint meeting of the central bank governors of the Nordic countries that took place on Sunday morning, 27 September, in

\(^{18}\) The description of the Belgian case is based on van der Wee and Tavernier (1975), pp. 240-242, and Janssens (1976), pp. 222-227.

\(^{19}\) For the following see de Vries (1989), pp. 461-467.

\(^{20}\) *Economist*, 3 October 1931, p. 614. The article was written on 30 September.

\(^{21}\) *Economist*, 10 October 1931, p. 614.
Stockholm. The situation was alarming. On Monday, the Swedish central bank had increased the discount rate from 4 to 5 percent and on Friday from 5 to 6 percent, and on Saturday the Norwegian and the Danish central bank tightened as well. Furthermore, on Tuesday, 22 September, Denmark had already reacted to the worsening of the situation by prohibiting the export of gold, and the Swedish central bank was still hoping for a foreign loan to cover its losses.

Yet, while all four Nordic countries were hit by the sterling crisis, the exchange of views on the current situation brought up interesting differences. Nicolai Rygg, Governor of Norges Bank, explained that Norway’s foreign exchange reserves were shrinking partly as result of a protracted labor dispute and partly because of the deficit of the trade balance. Furthermore, Norway’s shipping business was adversely affected by the devaluation of sterling as the freights were calculated in sterling and many ships were chartered for a period of five to ten years, on the basis of freight contracts settled in sterling. Although there was no immediate pressure to leave the gold standard, Rygg concluded that it would be better to suspend convertibility before the central bank reserves would be depleted. He also drew attention to the negative effects of Denmark’s prohibition of gold exports and showed his concern about the stability of the Norwegian banking system.

The Danish official, Baron Rosenkrantz, told his colleagues that a devaluation of the krone was not an option, although Danish exporters were affected by the depreciation of sterling more than any other European country. Rosenkrantz’s argument was that the prohibition of gold exports, effective since Tuesday, had stopped the pressure on central bank reserves and was therefore sufficient for the time being. He admitted that his country needed more dollars to pay for imports from the United States. Denmark’s trade balance with the US had always been highly negative. In 1929 Denmark imported goods for more than 200 million kroner, while exports were negligible (19 million kroner). But at this point, the official position of the Danish central bank was that no action needed to be taken with regard to devaluation.

22 We have found two protocols: in the archives of the National Bank of Denmark in Copenhagen (Direktionsprotokol, 2690 g, 27 September 1931) and the Riksbank in Stockholm (Roth Papers Box 129). The two reports are overlapping, but not identical. We use information from both sources.
Risto Ryti, the governor of the Finnish central bank, argued in a similar vein as Rosenkrantz. The problem was that Finland was not receiving any foreign exchanges for its exports lately. The foreign exchange rate reserves of the central bank were sufficient for at least one month, and the short-term debt of the Finnish government would not have to be renewed until December or January. Ryti also emphasized that Finland’s position was better than the Swedish one because the Finnish trade balance was positive. Finally, he mentioned that the banking sector was in a healthy condition, except a savings bank in the capital Helsinki.

Ivar Rooth, the governor of the Swedish central bank, aired yet another opinion. As the Riksbank was the only Nordic central bank running out of reserves, he was particularly pessimistic about the prospects of the gold standard. Shortly before the meeting he had received the message that the French government was not willing to give Sweden a loan to help defend its currency. Rooth informed his colleagues that Sweden was not able to withstand the pressure for another month, and he agreed with Rygg that it was better to leave the gold standard before the central bank reserves were depleted. After the meeting the board of the Riksbank decided to abandon the gold standard and informed the other Nordic central bank governors of its decision. Norway followed immediately, while Denmark waited another day. Finland waited even longer. No until October 3 did it introduce foreign exchange controls, on October 12 it suspended the gold standard.

The reconstruction of the decision-making process allows us to draw two important conclusions. First, the deterioration of the trade balance due to the depreciation of sterling was not a sufficient reason to abandon the gold standard. The central issue was the drain of gold and foreign exchange reserves due to speculative attacks, and there was no consensus. Denmark and Finland wanted to continue to defend their currencies, while Norway and Sweden advocated the suspension of the gold standard, though for different reasons: Norway wanted to act before reserves were run down, while Sweden was forced to act because reserves were already depleted.

Second, there was no collective action taken by the four Nordic countries. Sweden took a unilateral decision, followed by Norway, while Denmark and Finland decided to wait.

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24 Sveriges Riksbank archives, Särskilt protocol, 27 September 1931.
Therefore, it would be wrong to argue that the Nordic countries devalued because of their interregional trade linkages. Each country had its own agenda. Sweden’s decision certainly had an impact on the other three countries, but as the minutes of the meeting show, Norway had its own reasons to follow immediately. And Finland which had close trade relations with Sweden believed to have the strength to defend the current exchange rate of its currency. Finland had not restored the gold standard at the old parity after World War I and was reluctant to experience yet another devaluation after a few years.

In conclusion, Sweden’s departure from gold on September 27, 1931, cannot be entirely explained by the sterling crisis. The Riksbank entered the sterling crisis with a weak reserve position. Had it disposed of ample reserves like the Belgian or the Dutch central bank, the krona had probably remained on the gold standard.

3. The emergence of the maturity mismatch

*The Riksbank and the banking system*

In order to understand why the Riksbank’s reserve position was already weakened at the time when the sterling crisis broke out, we have to go back to the summer of 1931. Starting in July 1931 when the German crisis escalated, the Riksbank began to lose foreign exchange reserves at an alarming rate. Figure 2 and figure 3 show the evolution of the Riksbank’s total reserves in the crucial months of 1931 in comparison to the evolution of other central banks’ reserves. The verdict is clear. Neither the neighboring countries Denmark and Norway nor comparable small European countries like the Netherlands and Switzerland experienced a similar drain like Sweden. Evidently, Sweden suffered from specific problems before the sterling crisis put the final nail in the coffin.
Figure 2: Evolution of central bank reserves: Sweden in comparison with Denmark and Norway. (Source: Federal Reserve Bulletin)

Figure 3: Evolution of central bank reserves: Sweden in comparison with the Netherlands and Switzerland. (Source: Federal Reserve Bulletin)
The root of the problem was the foreign short-term deficit accumulated by the commercial banking sector. As figure 4 shows, this deficit emerged in the course of 1930. At the beginning of the year, commercial banks had disposed of a surplus of SEK 173 mio., at the end of the year they ran a deficit of SEK 12 mio. However, at this time the deficit was still too small to threaten the overall reserve position of the country, as foreign short-term assets of the Riksbank had increased from SEK 184 mio. to SEK 326 mio. But then, in the first five months of 1931, Sweden’s net foreign short-term position deteriorated dramatically. By May 1931, the commercial banking sector had accumulated a net deficit of SEK 141 mio., the Riksbank’s foreign short-term assets had been reduced by one third to SEK 218 mio., and Sweden’s overall surplus had shrank to a mere SEK 77 mio. To a large extent, the deficit resulted from the increase of foreign short-term liabilities of the banking sector. Between February and May, 1931, foreign short-term liabilities increased from 266 mio. to 377 mio. SEK, while foreign short-term assets hardly changed, decreasing from 250 mio. to 236 mio. SEK in the same period.

Figure 4: Foreign exchange reserves of Riksbank and foreign short-term balance of commercial banks. (Source: Ekonomisk Tidskrift, Översikt over de större bankernas ställning)
In June 1931, some Swedish banks began to lose foreign short-term deposits, and following Germany’s introduction of foreign exchange controls in mid-July, the outflow gained pace. To cover their losses, commercial banks resorted to large rediscounting operations, raising the amount of rediscounted securities from SEK 200 mio. to SEK 382 mio. As a result, the Riksbank’s foreign short-term assets decreased from SEK 240 mio. to SEK 93 mio. At the end of August, the gold cover ratio stood at 42 percent, the combined gold and foreign exchange reserves ratio at 65 percent – down from 95 percent at the end of April 1931.

In response to the dwindling foreign exchange reserves the Riksbank pursued the same policy as the Bank of England to stop the outflow. On 31 July 1931, it increased the discount rate from 3 to 4 percent. The tightening of monetary conditions by the central banks had some success, but the British pound and the Swedish krona recovered only temporarily. At the beginning of September, investors became nervous again. As the Riksbank continued to lose reserves, the Swedish authorities tried to obtain a loan from France and the United States. It was too late, however. At this point in time, nobody wanted to invest into the defense of the krona. The fall of sterling on 21 September triggered another wave of capital flight from Sweden, driving the level of central bank reserves even further down. After another futile attempt to secure a loan from New York or Paris, the Swedish government decided on Sunday evening, 27 September 1931, to suspend the gold standard.

Why were the Swedish commercial banks transforming their foreign short-term liabilities into long-term loans? A look at individual banks reveals that only the two largest commercial banks were responsible for the emergence of the foreign short-term deficit: Skandinaviska Kredit AB and Svenska Handelsbanken. The former was particularly generous in creating a dangerous maturity mismatch in its balance sheet, whereas the third and fourth largest commercial bank, the Göteborgs bank and Wallenberg’s Stockholms EB, played a minor role in this drama.

25 Archives Sveriges Riksbank, Särskilt protokoll, 30 July 1931, p. 43: Governor Rooth explicitly hinted at the policy of the Bank of England when proposing the increase of the discount rate.
27 Economist, 19 September 1931, p. 506.
Figure 5 plots the evolution of foreign short-term deposits at the four large commercial banks. In May 1931, Skandinaviska Kredit AB attracted by far the highest amount of foreign short-term deposits (SEK 122 mio.), followed by Stockholms EB (SEK 85 mio.), Svenska Handelsbanken (SEK 70 mio.) and Göteborgs (SEK 10 mio.). The figure also shows how drastically foreign deposits were being withdrawn after peak in May 1931. At the end of September 1931, the four largest commercial banks held only SEK 30 mio. of foreign short-term deposits – down from SEK 296 mio. in May 1931.

Figure 5: Foreign short-term deposits at four largest commercial banks. (Source: Ekonomisk Tidskrift, Översikt over de större bankernas ställning)
Most important for the overall reserve position of Sweden was the extent to which the Swedish commercial banks rediscouned their bills at the Riksbank to cover their losses. Figure 6, plotting the evolution of their rediscouting activity, reveals large differences. Skandinaviska Kredit AB increased the amount of rediscouted paper between May and September 1931 from SEK 107 mio. to SEK 195 mio., Svenska Handelsbanken from SEK 31 mio. to SEK 83 mio., and Stockholms EB from SEK 1 mio. to SEK 22 mio. Skandinaviska Kredit AB alone depleted the Riksbank’s foreign exchange reserves by the same amount as all other commercial banks together.
Why did the Skandinaviska Kredit AB accumulate such a high foreign short-term deficit? The reason was that the industrialist and financier Ivar Kreuger, the managing director of Skandinaviska Kredit AB and the governor of the Riksbank worked behind the scene to ensure the survival of Kreuger’s business activity. In other words, the fall of the Swedish krona was ultimately the consequence of crony capitalism and moral hazard. What economists observed as one of the roots of the East Asian crisis of 1997-98 was evidently an important element of the Swedish crisis as well. Clearly, it is a typical example for a third-generation model of currency crises.29

Kreuger’s risky ventures were very vulnerable to the business cycle as they were largely financed by issuing new securities. After the crash on Wall Street in October 1929 and the drying up of international capital markets in 1930, Kreuger needed other financial sources and turned to his long-time business partner Oscar Rydbeck, the managing director of Skandinaviska Kredit AB. Rydbeck was ready to help and almost ruined his bank. By September 1931, when the krona was devalued, almost a third of total lending (SEK 340 mio. of SEK 1078 mio.) had been directed to Ivar Kreuger and his businesses.31

One of Kreuger’s main goals was to monopolize global match production. In late October, 1929, a few days after the “Black Thursday”, Time Magazine ran a cover story on Kreuger under the title „Monopolist“. At the end of 1930, Kreuger controlled more than 40 percent of world match production through the companies of which he held a majority and an additional 22 percent through companies that were collaborating with Swedish Match. Thus, only 38 percent of world match production was completely independent of Kreuger’s influence (Lindberg 1982, p. 202). He gained control by providing loans to indebted nations in exchange for a match monopoly. From 1925 to 1930 he made deals amounting to 362.4 million USD, with the effective amount paid being around 339 million USD (Table 2). By far

28 The best studies of Kreuger’s networks and business interests were written in the 1970s. For a survey of the literature see Lindgren, “The Kreuger Crash of 1932”. As for our topic, the most important works are Glete, “Kreugerconcernen och krisen på svensk aktienmarknad” and Gäfvert, “Kreuger, riksbanken och regeringen”.
30 The Young Loan was the major exception: see Balderston (1993) and BIS annual report 1931-32.
31 See the history of Skandinaviska Kredit AB by Söderlund (1978). The figures are on pp. 482 and 493.
the most important loan was the one promised to Germany in 1929 (125 million USD).\textsuperscript{32} In addition, he participated in the Young loan that provided Germany with additional credit to meet its reparation payments. Kreuger gave 15 million USD out of a total of 300 million USD (5.5 percent loan, maturity of 35 years). Furthermore, Kreuger in 1930 planned to issue a loan of $75m to Italy, but the deal was not completed.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
Year of settlement & Country     & Nominal interest rate & Nominal amount of loan in mio. USD & Issue price in \% & Effective amount of loan in mio. USD \\
\hline
1925   & Poland I    & 7                       & 6.0     & 100    & 6.00  \\
1926   & Greece      & 8.5                     & 4.85    & 95     & 4.6   \\
1927   & France      & 5                       & 75.0    & 93.5   & 70.1  \\
1927   & Ecuador I   & 8                       & 2.0     & 88     & 1.76  \\
1928   & Estonia     & 6                       & 2.0     & 87-90-92 & 1.8  \\
1928   & Hungary     & 5.5                     & 36.0    & 92     & 33.12 \\
1928   & Latvia      & 6                       & 6.0     & 89-92  & 5.4   \\
1928   & Yugoslavia  & 6.25                    & 22.0    & 90     & 19.8  \\
1929   & Romania     & 7                       & 30.0    & 100    & 30.0  \\
1929   & Ecuador II  & 7                       & 1.0     & 84     & 0.84  \\
1929   & Germany     & 6                       & 125.0   & 93     & 116.25 \\
1930   & Danzig      & 6                       & 1.0     & 93     & 0.93  \\
1930   & Lithuania   & 6                       & 6.0     & 93     & 5.58  \\
1930   & Bolivia     & 7                       & 2.0     & 90.1   & 1.8   \\
1930   & Greece II   & 6                       & 4.85    & 85     & 4.1   \\
1930   & Turkey      & 6.5                     & 10.0    & 100    & 10.0  \\
1930   & Guatemala   & 7                       & 2.5     & 90     & 2.25  \\
1930   & Poland II   & 6.5                     & 26.4    & 93     & 24.6  \\
        &             &                         & 362.4   &         & ca. 339 \\
\hline
\end{tabular}
\caption{Loans provided by Kreuger in exchange for match monopoly}
\end{table}

Source: Glete (1981), p. 140

\textsuperscript{32} See Ferguson/Temin (2001, p. 30): Neither did they fall after the Creditanstalt collapsed – indeed, both Reichsbank gold and total foreign exchange reserves rose all through the month of May, though the entries for May 30th probably reflect a final payment the government received as part of a deal struck in 1929 for a match monopoly.
The Riksbank played an important part in these transactions. In January and May 1931, when Kreuger needed $8 mio. and $27.5 mio. respectively as part of large tranches to Poland and Germany, the Riksbank guaranteed a rediscount right of $20 mio. (SEK 75 million) to Skandinaviska Kredit AB.\(^3\) Other big banks also gave loans, in particular Svenska Handelsbanken, the largest Swedish bank which was closely tied to Kreuger’s pulp company.\(^4\) Even the bank of the competing Wallenberg family, the Stockholms Enskilda Bank (SEB), provided credits to Kreuger, especially in late 1930 and early 1931.\(^5\) Altogether, Swedish commercial banks increased their loans and advances to Kreuger from 357 million kronor at the end of 1929 to 828 million kronor at the end of 1931.\(^6\)

Clearly, Sweden as a rising financial center was overstrained by Kreuger’s activities. According to Fleetwood (1947) “in A.B. Kreuger & Toll a financial concern was built up which soon became responsible for transactions on a scale far beyond Sweden’s own resources.”\(^7\) And Paul Einzig observed in his book on the fight for financial supremacy that “[the] international character of Stockholm after the war was largely the result of the expansion of Kreuger and Toll”.\(^8\) In early 1931 the Riksbank found itself in a classical dilemma when it realized the extent of Kreuger’s accumulation of debt and the extent of involvement of the Swedish banking system. It was difficult to let Kreuger go bankrupt in the midst of the world economic crisis by denying him another line of liquidity. Kreuger’s business network was too big and too interconnected to fail.

In the Netherlands and Switzerland, by contrast, two countries with a long tradition as international financial centers, commercial bankers seemed to be more experienced in dealing with capital inflows caused by international instability and never used “hot money” for long-term investments, but parked these funds at the central bank. In the Netherlands, the sight deposits of commercial banks at the central bank continuously increased from Fl. 31 million at the end of December 1930, to Fl. 185 million at the end of August 1931, in Switzerland

\(^{3}\) The banking committee of the Riksdag documented the loans given to Kreuger by the Riksbank: Bankoutskottet, Utlåtande 40, 2 May 1932, pp. 20-33. For the figures see also Gäfvert (1979), pp. 60-82 and pp. 286-287.

\(^{4}\) See the history of Svenska Handelsbanken by Hildebrand (1971).

\(^{5}\) See the history of SEB from 1924 to 1945 by Lindgren (1988).


from CHF 242 million to CHF 632 million. In Sweden, by contrast, they decreased from SEK 301 million to SEK 165 million. The importance of Switzerland as a rising international financial center was also underlined by the fact that a Swiss city (Basle) became the seat of the Bank for International Settlements in 1930. Amsterdam was also mentioned as a possible candidate, but failed to succeed because it was considered an ally of Germany’s. By contrast, Stockholm was never mentioned as a possible location.39

4. The Swedish twin crisis

The international bond market

The maturity mismatch of foreign short-term balances was at the root of the crisis. Moral hazard and crony capitalism made it possible that two commercial banks were able to build up a sizeable foreign short-term deficit. The maturity mismatch, however, does not explain the dynamics of the crisis. It only set the stage, but did not trigger the collapse of confidence.40 What is clear is that the international liquidity crisis following Germany’s introduction of exchange controls in mid-July led to a massive withdrawal of foreign funds from Sweden and a rapid decline of central bank reserves. But it is not known how and when exactly foreign investors became mistrustful of the solvency of Skandinaviska Kredit AB and Handelsbanken and ultimately of the stability of the Swedish currency. In mid-July, there was no public information about the balance sheets of Skandinaviska Kredit AB, and the Riksbank’s reserve position looked sound at the end of June. How then was Sweden downgraded as a safe haven before the scramble for liquidity started in mid-July? Why did foreign investors withdraw

40 Cf. Radelet and Sachs 2000, p. 133: “Perhaps the most notable fact, however, is that these financial indicators show the vulnerability to crisis but do not guarantee the onset of crisis. They seem to be, in short, necessary but not sufficient conditions. In 1994, Indonesia, Korea, and Thailand already had ratios of short-term debt to foreign exchange reserves well in excess of 1.0, but they were not hit by the ‘tequila’ shock. (…) These patterns may indeed be the best confirmation of the multiple-equilibrium character of financial panics: we can identify conditions of vulnerability, and the need for modest adjustments, but we cannot predict the actual onset of crisis, since the crisis requires a triggering event that leads short-term creditors to expect the flight of other short-term creditors.” Interesting discussion of this view by Mishkin in its comment (pp. 158-159).
their short-term funds from Swedish commercial banks in the summer of 1931, while Dutch and Swiss banks were floated with “hot money”?

To answer these questions we collected daily quotations from the Zurich stock exchange that experienced a rapid rise of its international business after World War I. The Swiss banks received large amounts of long-term flight capital mainly from France and Germany, and the Swiss franc was one of the most stable currencies at the time. In 1931, 46 foreign sovereign and sub-sovereign bonds and 16 corporate bonds were listed. Among them we find the Dawes plan bond denominated in pound sterling (1924), the Dawes plan bond denominated in Swiss franc (1924), the Young plan bond denominated in Swiss franc (1929), and two Kreuger bonds: the 1928 Kreuger & Toll participating debenture and the 1929 Kreuger & Toll bond. A list of all foreign bonds listed at the Zurich stock exchange can be found in appendix 1.

As the Young plan bond (YPB) has been used by other economists to track the chronology of the German crisis, we are particularly interested in how it moved relative to other bonds, in particular the Kreuger bonds.41 We ran two kinds of tests to understand the dynamics leading to the downgrade of Sweden’s status as a safe haven. First, we undertook a covariance analysis in order to measure the correlation between the movements of all bonds quoted at the Zurich stock exchange. Table 3a and 3b show the results of the covariance analysis. Table 3a shows that within the group of corporate bonds the movement of the Kreuger & Toll participating debenture (KTPD) was much more correlated with the movement of the Young plan bond (YPB) than any other bond (0.65). Table 3b shows the correlation between KTPD and the sovereign and sub-sovereign bonds. Again, the picture is the same: KTPD is by far more correlated with YPB than any other bond (0.71). The only other security that comes near this high correlation is the one of the Land Baden, a German sub-sovereign bond.

41 Ferguson and Temin (2004). Cf. Scott Sumner: The price of the German war reparations bonds, dubbed “Young Plan bonds” (YPBs), were a good indicator of political turmoil in Germany during late 1930, and will prove to be an even better indicator during 1931 and 1932. The bonds had been originally issued in June 1930 at a price of 90, began 1931 trading at 69.25 and remained in the 68-84 range throughout the first five months of the year. One indication of the severity of the German economic crisis is that by yearend their price had fallen to 23.5.
Table 3a: Correlation between Young plan bond and corporate bonds

<table>
<thead>
<tr>
<th>BOND</th>
<th>DLOG (YPB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kreuger &amp; Toll participating debenture 1928</td>
<td>0.65</td>
</tr>
<tr>
<td>Deutsche Rentenbank- Kreditanstalt, Berlin</td>
<td>0.33</td>
</tr>
<tr>
<td>Compania Hispano-Americana de Electricidad</td>
<td>0.23</td>
</tr>
<tr>
<td>Kreuger &amp; Toll 1929</td>
<td>0.22</td>
</tr>
<tr>
<td>Caja de Credito Hipotecario (Santiago)</td>
<td>0.10</td>
</tr>
<tr>
<td>Badische Girozentrale</td>
<td>0.09</td>
</tr>
<tr>
<td>Cedulas Hipotecarias Argentinas</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Table 3b: Correlation between Young plan bond and sovereign/ sub-sovereign bonds and Kreuger & Toll Debenture

<table>
<thead>
<tr>
<th>BOND</th>
<th>DLOG (YPB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kreuger &amp; Toll Participating Debenture (KTPD)</td>
<td>0.71</td>
</tr>
<tr>
<td>Baden Freistaat (CHF)</td>
<td>0.47</td>
</tr>
<tr>
<td>Vorarlberg</td>
<td>0.26</td>
</tr>
<tr>
<td>Stadt Wien</td>
<td>0.23</td>
</tr>
<tr>
<td>Belgien äussere Anleihe</td>
<td>0.21</td>
</tr>
<tr>
<td>Japanische Anleihe 1907</td>
<td>0.18</td>
</tr>
<tr>
<td>Franz. Staatsbahnen 1926</td>
<td>0.15</td>
</tr>
<tr>
<td>Deutsche Reichsanleihe 1924 (Pfund)</td>
<td>0.13</td>
</tr>
<tr>
<td>Rumänien Stabilisationsanleihe</td>
<td>0.13</td>
</tr>
<tr>
<td>Santiago de Chile</td>
<td>0.12</td>
</tr>
<tr>
<td>Französische Staatsbahnen 1927</td>
<td>0.12</td>
</tr>
<tr>
<td>Polnische Stabilisationsanleihe</td>
<td>0.12</td>
</tr>
<tr>
<td>Bulgarien (ohne Marchzinsverrechnungssteuer)</td>
<td>0.11</td>
</tr>
<tr>
<td>Deutsche Reichsanleihe 1924 (CHF)</td>
<td>0.11</td>
</tr>
</tbody>
</table>

In a second step, we ran a Quandt-Andrews unknown breakpoint test to identify the moments when YPB and KTPD began their co-movements and an OLS regression to measure the
correlation in the periods between the breakpoints. Two breakpoints emerged from this exercise: May 19 and July 22. Table 4a and 4b show these results. And the OLS regressions showed a weak correlation before May 19, a strong correlation between May 19 and July 22, and a moderate correlation between July 22 and the beginning of the fall of sterling.

**Table 4a**

Quandt-Andrews unknown breakpoint test
Null Hypothesis: No breakpoints within 20% trimmed data
Varying regressors: All equation variables
Equation Sample: 12/16/1930 9/19/1931
Test Sample: 2/17/1931 7/28/1931
Number of breaks compared: 108

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum LR F-statistic (7/22/1931)</td>
<td>8.393745</td>
<td>0.0042</td>
</tr>
<tr>
<td>Maximum Wald F-statistic (7/22/1931)</td>
<td>16.78749</td>
<td>0.0042</td>
</tr>
<tr>
<td>Exp LR F-statistic</td>
<td>2.109217</td>
<td>0.0166</td>
</tr>
<tr>
<td>Exp Wald F-statistic</td>
<td>5.554500</td>
<td>0.0042</td>
</tr>
<tr>
<td>Ave LR F-statistic</td>
<td>2.833034</td>
<td>0.0269</td>
</tr>
<tr>
<td>Ave Wald F-statistic</td>
<td>5.666069</td>
<td>0.0269</td>
</tr>
</tbody>
</table>

Note: probabilities calculated using Hansen's (1997) method

**Table 4b**

Quandt-Andrews unknown breakpoint test
Null Hypothesis: No breakpoints within 25% trimmed data
Varying regressors: All equation variables
Equation Sample: 12/16/1930 7/18/1931
Test Sample: 2/13/1931 6/02/1931
Number of breaks compared: 70

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum LR F-statistic (5/19/1931)</td>
<td>5.014414</td>
<td>0.0663</td>
</tr>
<tr>
<td>Maximum Wald F-statistic (5/19/1931)</td>
<td>10.02883</td>
<td>0.0663</td>
</tr>
<tr>
<td>Exp LR F-statistic</td>
<td>1.838477</td>
<td>0.0289</td>
</tr>
<tr>
<td>Exp Wald F-statistic</td>
<td>3.804805</td>
<td>0.0253</td>
</tr>
<tr>
<td>Ave LR F-statistic</td>
<td>3.556098</td>
<td>0.0120</td>
</tr>
<tr>
<td>Ave Wald F-statistic</td>
<td>7.112196</td>
<td>0.0120</td>
</tr>
</tbody>
</table>

Note: probabilities calculated using Hansen's (1997) method

Dependent Variable: DLOG(KTPD)
Method: Least Squares
Date: 04/02/13   Time: 13:37
Sample (adjusted): 12/16/1930 5/1/1931
Included observations: 96 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.000802</td>
<td>0.001509</td>
<td>-0.531514</td>
<td>0.5963</td>
</tr>
<tr>
<td>DLOG(YPB)</td>
<td>0.231268</td>
<td>0.136412</td>
<td>1.695367</td>
<td>0.0933</td>
</tr>
</tbody>
</table>

R-squared 0.029670  Mean dependent var -0.000731
Adjusted R-squared 0.019347  S.D. dependent var 0.014929
S.E. of regression 0.014784  Schwarz criterion -5.516489
Sum squared resid 0.020546  Hannan-Quinn criter. -5.548318
Log likelihood 269.3558

Dependent Variable: DLOG(KTPD)
Method: Least Squares
Date: 04/02/13   Time: 13:39
Sample: 5/21/1931 7/18/1931
Included observations: 41

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.003898</td>
<td>0.003893</td>
<td>1.001341</td>
<td>0.3228</td>
</tr>
<tr>
<td>DLOG(YPB)</td>
<td>0.762559</td>
<td>0.094417</td>
<td>8.076482</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared 0.625826  Mean dependent var 0.000142
Adjusted R-squared 0.616232  S.D. dependent var 0.039952
S.E. of regression 0.024750  Schwarz criterion -4.512433
Sum squared resid 0.023890  Hannan-Quinn criter. -4.481994
Log likelihood 94.50487

Dependent Variable: DLOG(KTPD)
Method: Least Squares
Date: 03/27/13   Time: 16:41
Sample (adjusted): 7/25/1931 9/19/1931
Included observations: 38 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.013099</td>
<td>0.003860</td>
<td>-3.393642</td>
<td>0.0017</td>
</tr>
<tr>
<td>DLOG(YPB)</td>
<td>0.484727</td>
<td>0.088615</td>
<td>5.470043</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared 0.453895  Mean dependent var -0.014367
Adjusted R-squared 0.438725  S.D. dependent var 0.031701
S.E. of regression 0.023750  Akaika info criterion -4.591267
Sum squared resid 0.020306  Schwarz criterion -4.505079
Log likelihood 89.23408  Hannan-Quinn criter. -4.560602
F-statistic 29.92137  Durbin-Watson stat 2.001279
Prob(F-statistic) 0.000000
These results allow us to make a straightforward interpretation. In mid-May investors began to link the fate of Kreuger’s business network to the solvency of the German government, and they were sticking to this view until the full escalation of the German crisis in mid-July when a new dynamic set in. Of course, the mistrust of investors was not based on an intimate knowledge of the balance sheets of Ivar Kreuger’s businesses. In fact, at that time nobody besides Kreuger was able to keep track of profits and losses. But it was publicly known that Kreuger had given a loan to Germany amounting to $125 mio. in exchange for the match monopoly. It was a sort of “wake-up call”, a change in expectations based on imperfect information.

How can we explain the timing? Given that the Creditanstalt (CA) crisis escalated on May 11 when the bank disclosed its loss for 1930, it seems natural to attribute the shift in expectations towards the solvency of Germany and the businesses of Kreuger to the events in Vienna. The evidence supporting this kind of mechanism is relatively weak, however. The Austrian crisis appears to be irrelevant to the movement of the YPB and the KTPD. As figure 7 shows, the 1930 international Austrian bond hardly moved in the days after the disclosure of the CA losses, while the YPB had started its decline earlier. The sharp drop did not occur until May 27-28, after the Austrian central bank published its weekly statement showing a dramatic decline of foreign exchange reserves. It is true that the weekly statement published on May 20 had already revealed a substantial deterioration of the balance sheet of the central bank. The increase of notes in circulation, due to the liquidity crisis of the Creditanstalt, pushed the cover ratio down from 83 to 68 percent. Yet, at that moment, the co-movement of the YPB and KTPD had already began.

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42 See Partnoy (2009), passim
43 See Forbes 2012 for a survey of the literature.
44 Neue Zürcher Zeitung, Mittagsausgabe, 27. Mai 1931.
A more plausible explanation for the strong correlation of the YPB and the KTPD in May is the radicalization of German politics and the growing tension between France and Germany regarding the planned customs union between Austria and Germany. Actually, investors had become more pessimistic towards Germany as early as early May. On May 3, the French president Pierre Laval criticized the plans of Austria and Germany, and Hans Luther, president of the Reichsbank, complained about the negative consequences of the reparation payments.\textsuperscript{46} On May 6, the Berliner Tageblatt published rumours about an impending moratorium on German reparation payments.\textsuperscript{47} On May 8 the Young plan bond dropped by 1.4 percent. On May 13, the French foreign minister Aristide Briand who had worked towards a better collaboration between France and Germany lost the presidential election. On May 17, the Nazi party won an overwhelming victory in the Land of Oldenburg, increasing the number

\textsuperscript{46} NZZ, Morgenausgabe, 3. Mai 1931.
\textsuperscript{47} NZZ, Morgenausgabe, 7. Mai 1931.
of seats in the parliament (Landtag) from 3 to 19 seats out of total of 48 seats. Possibly, pessimism was reinforced by events in Austria, but there was enough reason to worry about Germany’s economic and fiscal outlook.

*The international interbank market*

On June 6, the German crisis intensified as the German government demanded a relief from the reparation claims and issued a new emergency decree, while chancellor Brüning met British Prime Minister Ramsay MacDonald at Chequers. Both the Young plan bond and the 1928 Kreuger & Toll participating debenture began to decline in the following days. The German central bank lost a third of its total reserves in the first three weeks of June, while the Swiss National Bank experienced a surge of a quarter during the same period.

The growing concern about Germany’s fiscal position affected the international interbank market. In June, Skandinaviska Kredit AB and Handelsbanken, the banks closely tied to the businesses of Ivar Kreuger, experienced a withdrawal. Figure 8 shows the extent of these movements. Compared to the withdrawal in July and August, the amount was modest. But there is no doubt that there was some sort of international “bank walk”, aimed at specific institutions, since Göteborgs bank and Stockholms E.B. did not experience any withdrawals in June. Obviously foreign banks knew which Swedish banks were more closely related to Ivar Kreuger and expected that Kreuger would face funding problems once the German government publicly discussed the possibility of a default.

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48 Since 1919 the city of Oldenburg had been the capital of the Free State of Oldenburg, a former grand duchy. In May, 1932, became the first Land that had a National Socialist majority in the Landtag.

Figure 8: Change of foreign short-term deposits in 1931

The fact that foreign banks distinguished between two groups of Swedish banks suggests that the confidence in the Swedish currency was still unshattered. In June official central bank reserves increased by SEK 15 mio., and if we add the amount of foreign exchange reserves the banking system withdrew from the central bank, even by SEK 36 mio. We therefore think that it is appropriate to speak of a twin crisis. The run on the currency started after the withdrawal of foreign funds from Swedish banks.

It is true that in contrast to Germany, the Swedish banks were sound as far as liquidity and equity ratios were concerned (Adalet 2003, Schnabel 2004). In this respect, even the Skandinaviska Kredit AB was in a relatively healthy position. At the eve of the crisis in May, 1931, when the foreign short-term liabilities reached a record high figure, the first-order liquidity ratio still stood at nearly hundred percent, while the corresponding figure for Germany’s great branch banks had fallen to 31.9 percent as early as November 1930. Similarly, expanded cash liquidity of Skandinaviska Kredit AB in May 1931 was at 37 percent, while the corresponding figure in November 1930 for Germany’s great branch banks
was at 9.9 percent. The equity ratio never fell below 15 percent, even in the summer of 1931, whereas the great German banks’ equity ratio had fallen to ten percent by that time. Furthermore, Skandinaviska Kredit AB did not experience a drain of domestic deposits in the summer of 1931. Domestic banks even increased their holdings from April to August, 1931. Only in September when the sterling crisis escalated did the domestic banks withdraw all their funds.

Nevertheless, the size of the maturity mismatch was substantial. In May 1931, the share of the foreign short-term deficit as a percentage of total liabilities amounted to 7 percent and to 44 percent as a share of equity. Skandinaviska Kredit AB was highly vulnerable. Consequently, the bank collapsed after Kreuger’s death in March of 1932 and had to be supported by the Swedish National Debt Office (Söderlund 1978, p. 495; Schön 2007, p. 344). From this perspective, Sweden’s currency crisis was a result of the weaknesses within the banking system, not the other way around. Without the maturity mismatch of Skandinaviska Kredit AB and Handelsbanken, the reserve position of the Riksbank would have remained stable like in Denmark and Norway or would have risen like in the Netherlands and Switzerland. Unlike in Germany, there was no independent fiscal or political shock undermining the confidence in the currency. The fall of the Swedish krona is a typical example for a third-generation model where the balance sheet of the financial sector plays an important role. Allen et al. (2002) distinguish four types of balance sheet mismatches: maturity mismatches, currency mismatches, capital structure problems, and solvency problems. Clearly, the Swedish case fits perfectly the first type of balance sheet mismatch.

**Liquidity crisis and meltdown**

As there was no currency crisis in June, an additional shock was needed to bring the krona down. It came in the form of foreign exchange restrictions introduced by Germany on July 15,
1931. Between the end of May and the end of June, 1931, the gold cover ratio of the central bank had dropped from 60 percent to little less than 40 percent which was the mandatory minimal ratio. As the gold outflows continued in July, accelerated by runs on German banks and the imposition of a banking holiday on July 13, the German authorities saw no other possibility to avert a devaluation of the Reichsmark than by introducing capital controls. Devaluation was rejected on two grounds: first, foreign government debt was denominated in US dollar, and, second, Chancellor Brüning believed that devaluation would lead to inflation which would trigger a panic.\textsuperscript{54}

The sudden stop of capital movements out of Germany induced a liquidity crisis. Confronted with the freezing of their assets in the largest economy of the Continent, foreign investors began to liquidate all assets for which they still could find a buyer. A gigantic deleveraging process was set in motion that spread the crisis across Europe.\textsuperscript{55} The Dutch central bank wrote in its annual report (April 1931 to March 1932): “The considerable volume of short-term loans on which the financial structure had been built up to an undue height were suddenly withdrawn. Countries which had heavy short-term indebtedness abroad and no resources available for its repayment, or which could not realize on their own foreign investments, were faced with great difficulties. With or without the cooperation of their creditors, they either suspended payments or left the gold standard.”\textsuperscript{56}

But there was more than that. For fear of further restrictions of international capital mobility, investors began to withdraw funds from all countries that were thought to be jeopardized by the German crisis. Hence, there was a double effect: repatriation of funds and „hot money“. As the Swiss National Bank wrote in its annual report 1931: „The Swiss money market was influenced by two movements which operated in the same direction and at times simultaneously—the inflow into Switzerland of foreign funds and the repatriation of Swiss foreign balances. (…). The situation abroad and the banking difficulties experienced in Switzerland made it necessary for our banks to increase their cash reserves against possible calls for payment. This insistence on a liquid position was the outstanding characteristic of the

\textsuperscript{54} On the reasons why the German government decided against a devaluation see Borchardt (1991) or Ritschl (2002) or Straumann (2009), Eichengreen and Temin (2000).

\textsuperscript{55} On the logic of a liquidity crisis see for example Calvo (1998).

\textsuperscript{56} Federal Reserve Bulletin, September 1932, p. 578.
money market.”57 The BIS shared the view that the liquidation consisted of not only of repatriation, but also of “transfers of funds from one foreign country to another.”58

The consequences of the liquidity crisis were immediately visible in the balance sheets of central banks and in the foreign exchange market. The main recipients of gold and foreign exchange reserves were France, the Netherlands, Switzerland, and the United States. The most prominent victim was the United Kingdom. In July the Bank of England lost gold reserves amounting to £150 mio. and foreign exchange reserves amounting to £182 mio. The second victim was Sweden. In July, the foreign exchange reserves of the central bank diminished by more than 20 percent from 240 to 189 million kronor.

A closer look at the balance sheet of the Swedish central bank reveals that the currency crisis only gradually turned into a panic. In July, the Riksbank was still registering a net increase of foreign exchange reserves before accounting for the transfer of foreign reserves to Skandinaviska Kredit AB and Handelsbanken as figure 9 shows. The currency crisis had begun, but it was not directly aimed at the reserves of the Riksbank yet. And perhaps for this reason, the Riksbank exchanged krona for foreign currencies without demanding collateral from the banking system. Nevertheless, the pressure became stronger towards the end of the month. As a result of the pressure on the currency and the dwindling of reserves, the board of Riksbank on 30 July decided to increase of discount rate by one percent to four percent after the Bank of England informed its Swedish colleagues about its decision to increase the discount rate.59

59 Särskilt protocol, 30 July 1931.
Only in August did the loss of gold and foreign exchange reserves surpass the transfer of foreign assets to the Swedish banking sector. Now, there was a full blown currency crisis. Likewise in August, the Riksbank lost foreign exchange reserves amounting to SEK 96 mio. and gold reserves amounting to SEK 8 mio. SEK (3.4 percent of total gold reserves), and it began to demand collateral in exchange for its foreign exchange reserves transferred to Swedish commercial banks. By the end of August, the reserve cover of the Riksbank had declined at 65 percent, down from 91 percent at the end of June. At least, the gold cover ratio remained stable at 42 percent, but due to the rapid outflow of foreign exchange reserves, the Riksbank decided at its meeting on September 5 to seek a loan from US banks.60

The Layton report, published on 18 August 1931, revealed that by mid-July, when foreign exchange restrictions were introduced, Sweden had substantial claims vis-à-vis Germany: RM 797 mio. of long-term claims and RM 101 mio. of short-term claims. In the context of

60 Särskilt protocol, 5 September 1931.
dwindling central bank reserves, the publication of these figures hardly served to reassure foreign holders of Swedish currency. However, it would be wrong to believe that Sweden was in a particularly difficult situation. The Layton Report showed that the Netherlands had outstanding long-term claims amounting to RM 1174 and short-term claims amounting to RM 336 mio., while the corresponding figures for Switzerland were RM 512 mio. and RM 581 mio. All three small creditor nations were confronted with a sudden shortage of liquidity, but only the Swedish currency was dropped by international investors, while the Dutch and the Swiss National bank continued to receive foreign funds. From the end of May to the end of August, gold and foreign exchange reserves of the Netherlands increased by 30 percent, those of the Swiss National Bank by 84 percent (cf. figure 3 above).

In the first half of September the situation somewhat stabilized at least as far as the gold reserves of the Riksbank were concerned. From the end of August throughout September 19, one day before the British authorities decided to suspend the gold standard, they remained at SEK 229.5 mio. Yet, with the British pound leaving the gold standard, the situation rapidly deteriorated. From Monday, September 21, to Saturday, September 27, the Riksbank registered a loss of gold amounting to SEK 31 mio., mainly to Paris and the Federal Reserve Bank. In addition, it lost US dollar assets amounting to SEK 76 mio. and sterling assets amounting to 4.1 mio. The stock of foreign exchange reserves was practically depleted, and the gold cover ratio had fallen below 40 percent. After the meeting with the governors of the other Nordic central banks and the failure to obtain a loan from New York or Paris the Riksbank had no other choice but to abandon the gold standard and to depreciate the krona.

6. Conclusion

In recent times, economic historians have begun to combine research on banking history and monetary history in order to explain the dynamics of financial crises – dubbed as “new monetary and financial history” (Eichengreen 2011). The paper has tried to show that this

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61 Särskilt protocol, September 27, 1931.
62 Särskilt protocol, September 27, 1931.
approach is particularly fruitful for the analysis of Sweden’s currency crisis in September of 1931. Contrary to a widely held view, Sweden was not forced to follow the UK because of close trade or monetary relations. The suspension of the gold standard was rather the result of imbalances in the banking sector. In 1930 and in the first semester of 1931 a few commercial banks, with the backing of the central bank, had used their abundant foreign short-term deposits to provide long-term loans to the Swedish financier and industrialist Ivar Kreuger who had lost its main funding source since the stock market crash of October 1929. Kreuger was also the main reason why investors sold their krona assets when the German crisis broke out. Kreuger had given the German government a large loan in exchange for the match monopoly. When Germany became insolvent, investors feared that Sweden’s banking system and ultimately the Swedish currency was doomed because of Kreuger’s importance for the Swedish economy. When sterling fell, the Riksbank had almost no foreign exchange reserves left. On September 27, 1931, the Board of the Riksbank urged the government to suspend the gold standard. On the evening of the same day, finance minister Felix Hamrin made the decision public.

The initial impulse that lay behind the growing skepticism towards Swedish commercial banks linked to Kreuger’s investments is a typical example of “pure contagion”. The deepening of Germany’s fiscal crisis in early June led investors to reassess their outlook of the Swedish banking system without possessing any reliable information. With the escalation of the German crisis, the bank walk turned into a bank run, and due to the maturity mismatch, the withdrawal of foreign funds proved lethal for the gold standard. In many ways, the Swedish currency crisis followed the same script as the East Asian crisis in the late 1990s. The currency crisis was more than the result of self-fulfilling attack, but the speculative element was crucial in the initial stage.

This said, Sweden’s currency crisis fundamentally differed from the sterling crisis. True, both the UK and Sweden abandoned the gold standard at an early stage of the world economic crisis and both their currencies were ultimately victims of the German crisis of July 1931. But what depleted the reserves of the Bank of England was among other factors the liquidity crisis experienced by the clearing banks in the City of London, while in Sweden the maturity mismatch of two commercial banks was the root of the vulnerability that was exposed by the
liquidity crisis following Germany’s introduction of exchange controls in mid-July. Similar outcomes thus can have very different reasons. Furthermore, it is questionable whether Sweden can be categorized as a true creditor country.

The main lesson to be drawn from Sweden’s twin crisis is clear. Maturity mismatches are very risky (see Forbes 2012). They are not a problem as long as there is no financial panic or a liquidity crisis. But things can change very quickly. Even in early 1931, only a few observers were betting on a German crisis. When in spring 1931 the Austrian-Swiss banker Felix Somary withdrew all the funds from Britain, Germany and Italy, his partners opposed him, because they considered his pessimism excessive and disruptive for their business.63

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Appendix 1
List of foreign sovereign and sub-sovereign bonds listed at the Zurich stock exchange

Belgien Freistaat (CHF)
Belgien Stabilisierungsanleihe
Belgien äussere Anleihe
Brasilianische Anleihe
Bregenz, Stadt
Bulgarien (ohne Marchzinsverr.)
Bulgarien (Stab.anleihe)
Chile, Republik
Chile, Rep., CH/NL-Tranche
Dänische Staatsanleihe
Deutsche Reichsanleihe (1924/CHF)
Deutsche Reichsanleihe (1924/Pfund)
Deutsche Reichsanleihe (1930)
Stadt Bochum
Stadt Dortmund
Stadt Flensburg
Stadt Freiburg i.Br.
Stadt Heidelberg
Stadt Karlsruhe
Stadt Krefeld
Stadt Nürnberg
Stadt Dornbirn
Franz. Staatsbahnen 1926
Französische Staatsbahnen 1927
Griech. Stab u. Flüchtlingsanleihe
Japanische Anleihe 1907
Japanische Anleihe 1910
Stadt Konstanz
Stadt Kopenhagen
Liechtenstein Anl.
Norwegische Anl.
Österreich, garant. Staatsanl.
Österreich, int. Anleihe
Österreich, Staatsschatzanw.
Ottomanische Anl.
Pol. Stab.anl.
Rumänien Stab.anl.
Stadt Salzburg
Santiago de Chile
Staatsbahn Elsass-Lothringen 1926
Staatsbahn Elsass-Lothringen 1927
Stadt Stockholm
Ungarische Staats.
Vorarlberg
List of foreign banking and trust bonds listed at the Zurich stock exchange
Kreuger & Toll (gewinnber. Oblig.)
Kreuger & Toll 1929
Badische Girozentrale
Caia de Credito Hypotecario (Santiago)
Cedulas Hipotecarias Argentinas
Comp. Hisp.-Americana Electricidad (Rentenbons à Pesetas 500.-)
Comp. Hisp.-Americana Electricidad (à Dollar m/n 225.-)
Deutsche Rentenbank-Kreditanstalt
Förenings Banken i Finland
Hypothekenverein Finnland
Köngl. Schwed. Reichshypothekenbank
Pester Ungar. Commercialbank
Staatshypothekenbank Kgr. Jugoslawien 1924
Staatshypothekenbank Kgr. Jugoslawien 1927
Pester Erster Vaterländ. Sparcassa Verein 1931
Tirolische Landes-Hypothekenanstalt, Innsbruck