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# A TWIN CRISIS WITH MULTIPLE BANKS OF ISSUE SPAIN IN THE 1860S

Alessio Moro, Galo Nuño  
and Pedro Tedde



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### **Alessio Moro**

University of Cagliari

### **Galo Nuño**

European Central Bank; e-mail: [galo.nuno@ecb.europa.eu](mailto:galo.nuno@ecb.europa.eu)

### **Pedro Tedde**

Banco de España

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<b>Address</b>	Kaiserstrasse 29, 60311 Frankfurt am Main, Germany
<b>Postal address</b>	Postfach 16 03 19, 60066 Frankfurt am Main, Germany
<b>Telephone</b>	+49 69 1344 0
<b>Internet</b>	<a href="http://www.ecb.europa.eu">http://www.ecb.europa.eu</a>
<b>Fax</b>	+49 69 1344 6000

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### **Abstract**

We document the twin crisis that affected Spain in the mid-1860s. First, we trace back its origins to the international crisis of 1864-66. Next, we describe the particular banking sector of Spain, characterized by the coexistence of the Bank of Spain with multiple local banks of issue. We analyze the microeconomic behavior of each bank in response to the crisis and find that, overall, the banks of issue performed well during the crisis. The Bank of Spain resulted as the most destabilizing institute due to its involvement with a Government on the brink of default.

**Keywords:** sudden stop, lender of last resort, financial crisis, Overend, Gurney and Co.

**JEL classification:** N13, N23, E31, E5.

## **Non-technical summary**

During the last decades, several emerging market economies have experienced a banking crisis together with a sudden stop. In most of these cases national governments and national central banks adopted several types of interventions to fight the crisis. In this paper we analyze an early example of twin-crisis, which occurred in the 1860s in Spain. The episode is particularly interesting due to the decentralized nature of the Spanish banking system of that time.

We document how, at the beginning of the 1860s, Spain experienced a large and relatively quick inflow of foreign capital followed by a sudden stop in the middle of the decade. In the following years the Spanish economy was hit by a severe banking and economic crisis with GDP falling by more than 10% in 1868 and half of the Spanish banks going bankrupt in the years between 1865 and 1870.

We argue that the main reason of the stop in capital inflows is the international financial crisis of 1864-66. This was a major crisis that affected most European economies and provoked the fall of one of the largest London banks, Overend, Gurney and Co., which was followed by the ‘Black Friday’ of May 1866, a massive financial panic in the City of London that quickly spread to other countries in Europe. We collect new empirical evidence supporting our claim: capital inflows were abruptly interrupted from 1864 to 1867, in line with a current account correction during the same period and two recessions, a softer one in 1865 and a more severe one in 1868. We document how the two main financial shocks, those of 1864 and 1866, were coincident with large financial panics across Europe.

We also analyze the microeconomic behavior of individual banks of issue in facing the crisis. To this end we construct a database with information about the balance sheets of the banks of issue. We regard this as a natural experiment in which all banks operating under a common regulatory and economic environment face a common aggregate financial shock represented by the twin-crisis. We find that three out of twelve banks of issue existing before the crisis were liquidated due to it. In these cases the direct exposure to unprofitable railways projects or the involvement with investment banks that were bankrupted during the crisis are the main causes of the liquidation. In contrast, a number of banks of issue experienced an improvement in their balance sheet position during the crisis. Such banks had little exposure to risky speculative investments (typically railways projects) and enjoyed a *flight to quality* effect during the panic, by attracting funds withdrawn from

investment banks. There is also a number of banks that were created during the crisis and managed to expand their operations and prosper over time.

The largest actor in this picture was the Bank of Spain, which performed in a fashion which is different from the rest of banks. The Bank massively contracted deposit and banknotes during the crisis in an attempt to improve its liquidity ratios. Our results indicate there was a negative correlation between the liquidity of the bank and the share of public debt over its portfolio in the period considered. This was due to the large involvement of the Bank with the Government, which was perceived by the public to be on the brink of bankruptcy. In fact, the operations of the Bank were mainly focused on providing credit to the Government, rather than on discounting bills to the private sector. In addition, Government pressures prevented the Bank from obtaining additional liquidity by selling its holdings of public debt during the crisis.

## 1. Introduction

During the last decades, several emerging market economies have experienced a banking crisis together with a sudden stop.<sup>2</sup> For instance, Eichengreen, Gupta and Mody (2008) find that roughly 50 percent of sudden stops coincide with banking crisis, while only 30 percent coincides with a currency crisis. In this paper we analyze an early example of twin-crisis, which occurred in the 1860s in Spain.<sup>3</sup>

We first reconstruct a series of the capital account balance of the Spanish economy to document how, at the beginning of the 1860s, Spain experienced a large and relatively quick inflow of foreign capital followed by a sudden stop in the middle of the decade. In the following years the Spanish economy was hit by a severe banking and economic crisis with GDP falling by more than 10% in 1868 and roughly half of the Spanish banks going bankrupt in the years between 1865 and 1870. We argue that the main reason of the stop in capital inflows is the international financial crisis of 1864-66. This was a major crisis that affected most European economies and provoked massive financial panics in Paris and London that spread to other countries in Europe.

The episode is particularly interesting due to the decentralized nature of the Spanish banking system of that time. This period was characterized by the coexistence of the Bank of Spain and other local banks of issue in a system of fractional-reserve banking. The Law of Banks of Issue of 1856 created such a system of multiple banks of issue. New banks had the monopoly of emission in their respective cities, while the Bank of Spain retained the monopoly in Madrid and in any place where no bank of issue was to be created.

We analyze the microeconomic behavior of individual banks of issue in facing the crisis. In this, our analysis differs from that of Schnabel (2004), who focuses on how the sudden stop and the banking crisis fostered each other in a vicious spiral during the German twin-crisis of the 1931. Here we analyze the balance sheet of the individual bank of issue, which takes the twin-crisis as given and behaves accordingly. This can be regarded as a natural experiment in which all banks operating under a common regulatory and economic environment face a common aggregate

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<sup>2</sup> A sudden stop is typically defined as a sudden reduction in capital inflows and a corresponding sharp reversal from large current account deficits into smaller deficits or even small surpluses, typically followed by a sharp decrease in output. See, for example, Calvo and Reinhart (2000) or Edwards (2004).

<sup>3</sup> The term “twin-crisis” is commonly used to indicate a banking crisis occurring together with a currency crisis, as in Kaminsky and Reinhart (1999). Here we use this term to denote a banking crisis occurring together with a sudden stop.

financial shock represented by the twin-crisis. In this view, our analysis shares some similarities with Accominotti (2012).

We find that three out of twelve banks of issue existing before the crisis were liquidated due to it. In these cases the direct exposure to unprofitable railways projects or the involvement with investment banks that were bankrupted during the crisis are the main causes of the liquidation. In contrast, a number of banks of issue experienced an improvement in their balance sheet position during the crisis. Such banks had little exposure to risky speculative investments (typically railways projects) and enjoyed a *flight to quality* effect during the panic, by attracting funds withdrawn from investment banks. There is also a number of banks that were created during the crisis and managed to expand their operations and prosper over time.

The largest actor in this picture was the Bank of Spain, which performed in a fashion which is different from the rest of banks. The Bank massively contracted deposit and banknotes during the crisis in an attempt to improve its liquidity ratios. Our results indicate there was a negative correlation between the liquidity of the bank and the share of public debt over its portfolio in the period considered. This was due to the large involvement of the Bank with the Government, which was perceived by the public to be on the brink of bankruptcy. In fact, the operations of the Bank were mainly focused on providing credit to the Government, rather than on discounting bills to the private sector. In addition, Government pressures prevented the Bank from obtaining additional liquidity by selling its holdings of public debt during the crisis.

This paper contributes to the literature on the Spanish crisis of 1864-1866. Other studies of the Spanish economy in the 1856-1874 period are Fernández-Pulgar and Anes-Álvarez (1970), Martín-Aceña (2000), Sánchez-Albornoz (1977), Sánchez-Ballesta and Bernal (2010), Sardà (1948), Sudrià (1994), Tedde (1974, 1978, 1999, 2004, 2006) and Tortella (1969, 1970, 1973). In contrast with the previous literature, we mainly emphasize the international nature of the crisis and its twin nature.<sup>4</sup>

The paper also contributes to the emerging literature about twin crisis in a historical context. In addition to the already mentioned Schnabel (2004) and Accominotti (2012), who analyzes the 1931 crisis in England, a closely related paper is Schnabel and Shin (2004) which focuses on the crisis of northern Europe in 1763.

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<sup>4</sup> See also Hawtrey (1919).

The remaining of the paper is as follows: section 2 briefly summarizes the international financial crisis of the years 1864-1866; section 3 describes the main features of the Spanish financial and economic system of the time while section 4 focuses on the 1864-66 crisis in Spain. Section 5 analyzes the sudden stop in capital inflows. Section 6 discusses the behavior of the banks of issue during the crisis while section 7 is devoted to the analysis of the Bank of Spain. Finally, section 8 concludes.

## **2. The international crisis of 1864-6**

Starting in 1864 a severe economic crisis affected most European economies. The crisis was preceded by a tremendous expansion in money and credit in the late 1850s and early 1860s due to the emergence of joint stock banks. A joint stock bank was a new form of financial enterprise to furnish funds for new enterprises upon pledge of their stock. For example, a proposed railway did not have to await the slow process of placing its stock and bonds among investors, in order to obtain funds to begin construction, but would deposit these securities in a joint stock bank, which would agree to accept its debts for a specified sum. These joint stock banks were able to sell their own shares and thus obtain the funds to make advances to the railways companies. In addition, the principle of limited liability reduced the risks for stockholders.

The arising of joint stock banks in France pushed for legal reforms in England and Spain in order to open new branches in these countries. The Joint Stock Companies Act of 1856 and Company Act of 1862 in the UK and the *Ley General de Sociedades de Crédito* in Spain introduced this new form of banking in these countries. In the first half of the 1860s, the increase in leverage made possible by the emergence of joint stock banks fuelled a European surge in cotton prices and, to a minor extent, in railways. Cotton prices increased fourfold from 1860 to 1864. The rise in cotton prices was a consequence of the American Civil War (1861-1865) that caused the blockade of the Southern ports, which reduced the supply of cotton for European mills, producing a rise in cotton imports from Eastern countries. However, in 1864, the economic climate became more uncertain due to the troubles in European politics caused by the Prussian hegemonic policy inspired by Bismarck. The Bank of England aggressively raised its discount rate in November and December 1863 and a banking panic occurred in Paris in January 1864. The Second Schleswig War between Prussia and Denmark began in February of the same year. The international turmoil was followed by a run into safe assets such as gold that forced the main central banks in Europe to raise interest rates again in order to avoid running out of metallic reserves. From October 1863 to October 1864, the discount



rate of the Bank of England was raised from 4 to 9%. The Bank of France raised the discount rate to 8% and purchased bullion to the amount of 221 million francs. The abrupt tightening of monetary policy amid a climate of pessimistic expectations generated the collapse of cotton prices and a stock market crisis in most of the continent.

The international situation seemed to be back in control in 1865 and the Bank of England reduced the rate again below 4% during the summer. But in 1866, another huge shock disturbed the financial economy in Europe, especially in the UK, when the bank Overend, Gurney & Co. suspended payments on May 10<sup>th</sup> 1866 and went into liquidation in June. On May 11<sup>th</sup>, known as *Black Friday*, Lombard Street witnessed a stock market collapse and a banking panic with crowds at the gates of the most reputed banks. This occurred amid a climate of pessimism due to the political situation in Central Europe, where the Austro-Prussian War was about to begin.

As occurred in 1847 and 1857, the Chancellor of the Exchequer authorized the suspension of the Bank Charter Act of 1844 ('the Peel Act') that prevented a strict support of gold, at cent per cent, for the quantity of money at circulation. The temporary suspension of the Bank Charter Act allowed the Bank to facilitate paper money without restriction, even with more severe conditions for credit advances. On Saturday 12<sup>th</sup>, the Bank of England was authorized to supply additional £4 million not covered by gold reserves at a discount rate of 10%.

The rate of 10% at the Bank of England was maintained from May 11<sup>th</sup> to August 6<sup>th</sup>. Several banks and companies went bankrupt during this crisis. The result was a second wave of monetary tightening in 1866 that severely affected the already weak health of banks and firms, not only in England, but also in continental Europe. In Italy, for instance, the Government introduced the *corso forzoso* on May 11<sup>th</sup>, which represented a suspension of the convertibility of the *lira* into gold and an additional supply of 250 million lire by the Bank of Italy. Similar situations were present in Prussia, Austria and Russia.<sup>5</sup>

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<sup>5</sup> Kindleberger and Aliber (2005, p. 117).

### 3. The Spanish economy in the early 1860s

In the mid-19<sup>th</sup> century, Spain was a predominant agrarian economy. Industrial working population accounted for 17% of the labor force.<sup>6</sup> In the period 1854-1856, a liberal Government headed by Baldomero Espartero began the discussion in the Parliament of a series of new laws aimed at modernizing the Spanish economy.

The first law, known as Disentailment Law (*Desamortización General o de Madoz, 1855*), expropriated and auctioned the lands of the Catholic Church, the State and the local Governments. Some of the previous owners of these lands, like the Church and the local councils, were compensated with public debt.<sup>7</sup> The whole sale of public properties represented nearly 1960 million of pesetas, equivalent to one third of the Spanish Gross Domestic Product of 1860.

The second law was the General Railway Act (*Ley de Ferrocarriles, 1855*). It provided state aid and reduced the administrative burden for building railways lines in Spain, including the possibility of foreign investment in the stock of railways companies, the total exemption of custom tariffs in the import of iron, machinery, wagons and other transport equipment, and the public subsidizing of, at most, the third part of the construction budget. Prior to 1855, only 440 kilometers had been constructed in Spain; from 1856 to 1866, more of 4,300 kilometers were opened to the traffic. The total railway investment in Spain amounted in 1867 to more than 2,760 million of pesetas, jointly in stock and debenture bonds; of this sum, about 45% corresponded to French investments.<sup>8</sup>

The third one, the Credit Company Act (*Ley General de Sociedades de Crédito, 1856*) defined the conditions for the establishment of *sociedades de crédito*, that is, investment banks similar to the recently created *Crédit Mobilier* in France and the English joint stock banks. The success of the *sociedades de crédito* in Spain was similar to that in England of the joint stock banks. The consequence of the *Ley de Sociedades de Crédito* was the emergence of a great number of *sociedades de crédito* during the period 1856-1864 (see Table 1).

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<sup>6</sup> Spanish total population increased, since 1820 to 1850, from 11.7 to 15.3 million of inhabitants, which implies an average growth rate of 0.9 per cent, higher than in the rest of Southern Europe. See Perez-Moreda (1985, pp. 25-61) and Carreras and Tafunell (2010).

<sup>7</sup> The product of all these disposals was earned by the Treasury as extraordinary revenues during the years that this process lasted. In fact, the complete sale of public and Church properties almost took until the end of the century, due to magnitude of the transactions.

<sup>8</sup> Notwithstanding, effective French capital inflows were smaller, about 796 millions of pesetas, due to the fact that the debenture bonds were sold at a loss, thus providing a real profit of 6 per cent to the investors. See Tedde (1978, pp. 29-46).

The last of the liberal laws was the Bank of Issue Act (*Ley de Bancos de Emisión, 1856*). At that time, there were three banks of issue of Spain. The largest and oldest one was the Bank of San Fernando, while the other two were those of Barcelona and Cadiz. The law renamed the Bank of San Fernando as the Bank of Spain, for an initial period of 25 years and allowed the establishment of local banks of issue in each Spanish city where there were no existing branches of the Bank of Spain. These new banks had the monopoly of emission in their cities. The law also awarded the Bank of Spain the emission monopoly in Madrid and in any place where no bank of issue was to be created. Before 1874 the Bank of Spain only realized the opportunity of opening local branches in two places, Valencia and Alicante. With respect to the emission volume, the law entitled new and old banks of issue to emit banknotes in a volume of less than three times the amount of their metallic reserves, as in the 1851 law. The novelty was that the volume of banknotes was now limited by three times the amount of the initial capital, that is, a threefold expansion from the existing situation. Finally, the Government was responsible for the appointment of the Governor of the Bank of Spain and of the rest of the banks of issue.<sup>9</sup>

With the 1856 legislation the number of banks of issue grew from 3 (Bank of Spain, Barcelona and Cadiz) to 11 in 1861 and 21 in 1864. Similarly, 12 *sociedades* had been created in 1861 and 34 in 1864. The main business of the *sociedades* was to channel domestic and foreign funds towards new railways ventures and, to a minor extent, towards Spanish public debt. Only *Crédito Mobiliario Español* and *Compañía General de Crédito* had some investments in industrial activities such as mining or gas, and the amount was still tiny compared to their investments in railways. Despite the fact that the *sociedades* were not entitled to issue banknotes, they issued short-term bonds that in many cases played the same role. In the case of the banks of issue, their main business was bill discounting and commercial credit. The main exception was the Bank of Spain, which will be described below.

#### **4. The 1864-6 crisis in Spain**

The increase in credit due to the emergence of joint stock banks and the large investments in railroads allowed Spain to maintain sustained growth until 1864 (see Figure 1). However, between

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<sup>9</sup> This system had some similarities to "free banking" systems. For a description of proper free banking systems, see Selgin (1988) and Selgin and White (1994).

1864 and 1866 a severe financial crisis hit the country. In this section we describe the roots of the crisis and its effects on the Spanish financial and economic system.

According to Tortella (1969, 1973), the main cause of the Spanish crisis was the low realized returns on railroads investments. In 1864 the Spanish Government stopped paying railways subsidies and in October one of the largest *sociedades de credito*, la *Compañía General de Crédito*, suspended payments. The reason was the low profits obtained in two of its major investments, the railways lines Sevilla-Jerez-Cadiz and Merida-Sevilla. More than 85% of the assets were railways investments and thus, as the crisis began and banks were forced to deleverage, the bank was unable to meet the demands of its depositors and was forced to declare bankruptcy. Almost at the same time, and for similar reasons, the Banco de Valladolid, one of the new local banks of issue, also failed. Rumors were widespread about the weak state of the balance-sheets of most banks, both local banks of issue and *sociedades de credito*. The stock market plunged in 1864 in the middle of pessimistic expectations about railways prospects.

An alternative view, mostly overlooked in the literature suggests that the financial crisis that hit Spain could be due to international factors and linked to the financial crisis that hit European countries in those years. During the financial turmoil of 1864, stock prices of the main Spanish railways and mining companies collapsed in the Paris stock exchange. The Bank of Spain raised its discount rate in January and October 1864, following the main European central banks (see figure 2). The stock price of the bank of Spain began falling from the maximum levels attained in 1863. The decline was slow at the beginning of the year but after the summer stock prices were in free fall. The international origin of the Spanish crisis is in line with Kindleberger's one that the 1864-66 financial crisis was a European wide one rather than a collection of crises triggered by domestic factors in each country.<sup>10</sup>

The financial situation in Spain improved in 1865, in line with the short recuperation in Europe, just to reach its climax in 1866. On May 11<sup>th</sup>, when news about the failure of Overend arrived, the panic extended to many Spanish cities, especially Barcelona. On May 12<sup>th</sup>, the *Catalana General de Crédito* and the *Crédito Mobiliario Barcelonés*, two *sociedades de credito*, suspended payments. After that, a chain of bankruptcies extended through the country. When the crisis was over, more than 40 percent of the Spanish banks were officially liquidated. The crisis was especially severe for the *sociedades de Credito*, as they had concentrated their lending in new railways projects. The

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<sup>10</sup> See Kindleberger and Aliber (2005).

liquidation of the banks was a traumatic process. In Barcelona, for example, the military authorities forced banks to prioritize metallic debt payments to allow industrialists to pay wages to their workers due to the fears of a revolutionary upheaval.<sup>11</sup> In Madrid, 40 sergeants were shot after a failed coup against the Government, on June 22<sup>th</sup>.

Both 1865 and 1867 were recession years, but the full consequences of the financial crisis were to be felt in 1868, with a major GDP contraction shown in Figure 1. Thus, the economic crisis did not precede, but followed the financial crisis.

## 5. The sudden stop

As discussed in the previous section, most of the literature on the crisis of 1864-66 has focused on the domestic causes of the crises to explain the chain of bankruptcies. However, we know from Kaminsky and Reinhart (1999) that banking crises are often associated to currency crises to constitute what are now commonly labeled as twin-crises. In addition, Eichengreen, Gupta and Mody (2008) find that roughly 50% of sudden stops coincide with banking crisis, while only 30% coincides with a currency crisis. Thus, in such a context problems in the banking sector and those in the current account interact and reinforce each other in a vicious spiral, with both domestic and external factors contributing to determine the effects of the crisis. In this section we document how the Spanish economy experienced a sudden stop in the years 1864-66.

To this end, we first construct a series of the capital account balance of the Spanish economy for the period. The methodology and sources are discussed in the Appendix A. Results are displayed in Table 2 and Figure 3. From 1856 to 1863, an average of 154 millions of *pesetas* entered the country every year. Most of this money was channeled into the railways sector or into the *sociedades de crédito*, which typically reinvested funds in railways. This process abruptly came to an end in 1865. This year net capital inflows were only 27.2 million *pesetas*, they kept falling until the meager sum of 10.1 millions in 1866, with a slightly larger amount, 21 millions, recorded in 1867. Figure 3 is the clearest evidence of how during the years of the international crisis (1864-1866) a sudden stop occurred in Spain.

Figure 4 displays our estimation of the capital account. The figure shows that there is a sudden reduction of capital inflows during the crisis, which fell from around 3.5 percent of GDP to almost

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<sup>11</sup> See Blasco and Sudriá (2010).

zero. The subsequent large spikes in capital flows in 1868, 1872 and 1873 are due to new issues of public debt. Note that Prados de la Escosura (2010) also suggests that a sudden stop occurred during the crisis. However, his estimates are sensibly different from the ones provided here. This is because Prados de la Escosura constructs the capital account balance by adding the negative of the current account balance to the increase in foreign reserves, computed from yearly estimates of the stock of gold and silver.<sup>12</sup> The reliability of the estimation largely depends on the reliability of the data about the stock of gold and silver, which is based on mint data. This clearly presents a problem as it ignores the possibility of reductions in the stock of gold and silver due to metallic outflows.

Figure 5 and Table 3 display our decomposition of the payments to foreign capital. The construction of the data is discussed in Appendix A. Figure 5 shows that although payments due to railways investments were negligible in 1856, in less than 8 years they grew to reach a volume equivalent to that of debt service. Total payments fell in 1864, recover in 1865 and then declined until 1867, recovering steadily afterwards. Table 3 documents how, in the case of dividends to railways companies, payments peaked in 1865 and then steadily declined until 1869. Also, from the table it is clear how, since 1868, public debt service becomes the largest component of payments to foreign capital. Such huge increase in debt payments after 1868 reflects the large debt issues occurred after the revolution that deposed the Queen Isabel II of Spain.

Using the information described above we also reconstruct the current account balance, which appears in Figure 6. The figure displays a large increase in current account deficits from 1860 to 1863 followed by a sudden contraction from 1864 to 1867. The maximum deficit was around 4.5 percent of GDP in 1863 and it shrank to zero in 1867. Also, by combining the capital and current account estimates, Figure 7 displays the evolution of the changes in the stock of metallic currency and compares it to the estimation by Tortella (1982), based on mint data.<sup>13</sup> Our estimation yields a large fall in reserves from 1863 to 1866 followed by a strong build-up after the crisis years (1867-1869). In contrast, the mint data is fairly stable and it never displays (by definition) negative changes. The mint-based estimation is in clear discrepancy with the assessment by the observers at the time, such as Vázquez-Queipo (1861) or Santillán (1865), who were quite concerned about the outflow of specie from Spain. A posterior analysis by Barthe (1908) estimated that between 1856 and 1866 there was a net outflow of silver of 308.6 million pts.

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<sup>12</sup> The stock of gold and silver for 1850-73 comes from Tortella (1982). The data is reproduced in Martin-Aceña and Pons (2005), pp.678-0.

<sup>13</sup> We take the stock of metallic currency in 1874 and then proceed backwards using the net change in reserves associated with our estimation of the current and capital accounts.

## 6. The banks of issue during the crisis

In this section we analyze in detail the response of the banks of issue to the crisis. To this end, we have collected information about the book balance sheets of the Spanish banks of issue. In order to process this information, we first follow Kaminsky and Reinhart (1999) and present the unconditional mean evolution of a set of variables across the banks of issue.<sup>14</sup> That is, given  $x_{i,t}$  the value of variable  $x$  at time  $t$  in bank  $i$ , we define

$$x_t = 1/N \sum x_{i,t}$$

as the mean value across the  $N$  banks. The mean value is surrounded by half a standard error band, in order to provide information about the dispersion of the responses.

The upper left panel of figure 8 shows how the ratio of metallic reserves to banknotes experienced a jump in 1864, reflecting the strong reduction in the volume of banknotes and the increase in metallic reserves. The situation improved in 1868, even if the ratio did not recover to its pre-crisis value. In addition, during the crisis period there was also a substitution of banknotes with deposits, as shown in the upper right panel. This substitution began in 1862 (before the crisis) and reached its maximum in 1867.

The lower left panel of figure 8 displays the amount of banknotes and deposits expressed as a ratio of the paid-up capital. Before the crisis, the ratio was 2.4 and it fell to 1.2-1.4 in the 1864-66 period. This fall reflects again the reduction in the volume of banknotes and deposits during the crisis. Both this and the previous results are broadly in line with the findings of Kaminsky and Reinhart (1999) for twin-crises for emerging countries in the period 1970-1995. Also, they are in line with modern evidence for the US provided in Nuño and Thomas (2012), who document the pro-cyclicality of bank debt.

The lower right panel of figure 8 shows that credit grew substantially in the period 1856-1865 (with the exception of a small crisis in 1861, described for example in Sardá, 1948) and abruptly collapsed by 16% in 1866. After that, credit did not recover until 1871. However, as we show next, this collapse in credit does not stem from a common behavior of all banks of issue, but rather from heterogeneous responses across the banking system.

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<sup>14</sup> Data come from Schwartz (1970). We acknowledge that it would also be important to analyse the balance sheets of the *sociedades de credito*, which represented a relevant proportion of the Spanish financial system. However, we have not been able to reconstruct them so we restrict the analysis to the banks of issue.

We now turn to analyze the individual balance sheets of the banks of issue. For the sake of exposition, we have divided banks into four types according to their lifespan:

1. Type I banks are those created before the crisis began (we choose the year 1862 as the frontier) and which were not bankrupt during the crisis. The group includes middle size banks with paid-up capital ranging from 1 to 3 million pts, such as those of Bilbao, Santander or Zaragoza.
2. Type II banks are those that were liquidated as a consequence of the crisis. The group includes middle-size banks (capital ranging 1-5 million pts) created before the crisis, including the Bank of Cadiz, and small banks (capital of less than 1 million pts) created in 1864.
3. Type III banks are those that were created during the crisis and managed to survive it. They include small banks (capital around 1 million pts) created after 1862.
4. Finally, type 4 banks include the two largest banks of issue in the country. The banks of Spain and Barcelona, with a capital in 1864 of 30 and 5 million pts, respectively.<sup>15</sup>

Figures 9-12 display the evolution of paid-up capital, short-term credit, banknotes and deposits for the different types of banks. In the case of banks of type I, there is not a noticeable reduction in the amount of short-credit provided during the crisis (see figure 9). In some cases, such as the banks of Bilbao, Coruña or Malaga, there is a fall in credit in the year 1866, but this does not modify the increasing trend over the entire period displayed. The only exception is the bank of Zaragoza, which experienced a major reduction in the volume of its credits, from 11.6 million pts in 1865 to 5.4 in 1866. Regarding their liabilities, all banks except that of Santander experienced a contraction in the volume of their banknotes in 1866. In contrast, deposits increased in that year in Bilbao and Santander. In both cases, the increase in the volume of deposits is a consequence of the *flight to quality* from many investors who had funds in the *sociedades de crédito* of those cities (*Bilbaina de Crédito* and *Crédito Vasco* in Bilbao and *Crédito Cantabro* and *Unión Mercantil* in Santander) which were liquidated in the second half of 1866.<sup>16</sup> Here we define the flight to quality as the reallocation of funds from banks with weak balance sheets (*sociedades de credito*) to those with more solid balance sheets (banks of issue).<sup>17</sup> In both cases the banks of issue were perceived as safer than the *sociedades*, because of the smaller involvement in railways investments of the former with respect to the latter. As similar situation will be described below in the case of the Bank of Barcelona.

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<sup>15</sup> Paid-up capital of the Bank of Cadiz was as large as that of Barcelona (5 millions of pesetas). We don't include Cadiz in group IV as it was bankrupt during the crisis.

<sup>16</sup> Tortella, (1982, p. 281-283).

<sup>17</sup> See Bernanke et al. (1996) for the original definition of flight to quality.



In the case of banks of type II, the ones that failed during the crisis, we identify three distinct subgroups according to the balance-sheet dynamics. In the first subgroup we find the largest banks, those of Cadiz and Sevilla. Figure 10 shows how these banks were forced to reduce the volume of credit due to a reduction in their liabilities, mainly deposits, as doubts about their liquidity and solvency mounted since 1863.<sup>18</sup> The case of the Bank of Sevilla is particularly interesting. In the spring of 1866 the Bank provided generous funding to the *Credito Comercial de Sevilla* under dubious collateral, including shares of the Bank of Sevilla itself. After the panic of May 1866, the bank was forced to finance all its operations by issuing new banknotes well above the 1856 regulation. At that point, it decided to suspend convertibility of its notes into specie and as a consequence, banknotes began to trade with large discounts. In the same line, the Bank of Cadiz made huge loans without requiring adequate collateral and was, as the Bank of Sevilla, practically bankrupt after the summer of 1866.<sup>19</sup> The second subgroup coincides with the Bank of Valladolid. In this case, after a successful development from 1859 to 1863, a number of decisions caused the collapse of the bank in 1865 as this absorbed most of the losses from the *sociedades de crédito* of the city of Valladolid, which had recklessly financed low return railways projects in the North of Spain. The third subgroup includes three small banks (Burgos, Palencia and Santiago) that were created in 1864 and did not even manage to properly begin their operations.

Banks of type III are those created at the beginning of the crisis and they all managed to survive it. They were created in cities where no other financial institution existed, and they focused mainly on commercial operations. Possibly for this reason, they performed well during the crisis and afterwards. Figure 11 shows that this group of banks displays an increasing trend for short-term credit over time. Some of them, like those of Balear and Oviedo even expanded the amount of short term credit from 1864 to 1866. Also regarding the amount of banknotes and deposits, an overall increasing pattern over time can be observed in the bottom panels of figure 11. As in the case of short-term credit, several banks managed to expand the volume of banknotes (Oviedo, Pamplona, Reus, and Tarragona) and deposits (Balear, Pamplona, Tarragona and Vitoria) during the crisis.

Finally, two institutions deserve a separate discussion. In the case of the Bank of Barcelona, its evolution reproduces at a larger scale the patterns already discussed for the banks of Bilbao and Santander. The severity of the crisis in Barcelona can be appreciated by the severe reduction in

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<sup>18</sup> Tortella, (1982, p. 287).

<sup>19</sup> Tortella, (1982, p. 286).

credit in the years 1864 and 1866. Short-term credits fell from 15.4 million pts in 1863 to 10.7 in 1864 and from 14.5 in 1865 to 9.1 in 1866 (see figure 12). In contrast, the volume of banknotes and deposits increased during the same period due to the ‘flight to quality’ effect associated with the liquidations of the *Catalana General de Crédito* and the *Crédito Mobiliario Barcelonés*<sup>20</sup> For the Bank of Spain instead, there is a reduction of credit, banknotes and deposits during the crisis. Thus, the two largest banks in the country display very different patterns.

Table 4 provides a quantitative assessment of the severity of the financial crisis of 1864-66 for the banks of issue. The first two columns report the amount of credits, banknotes and deposits in the system of banks of issue in 1863, the last year before the crisis, and in 1866, the year in which the crisis was most severe. The third column reports the difference between the two years. In 1866 there were 22.7 millions of credits, 28.1 millions of deposits and 29.1 millions of banknotes less than in 1863 in the system of banks of issue. These numbers represent a decline of, respectively, 12%, 24% and 38% of credit, deposits and banknotes. The last three columns of table 4 decompose the decline in the three variables into the contribution of banks that survived the crisis (including those created during it and excluding the Bank of Spain), banks that were liquidated during the crisis (type II above) and the Bank of Spain. Regarding credit, 43% of the decline is due to the reduction to surviving banks and new banks, 25% to banks that collapsed during the crisis and 32% to the Bank of Spain. In the case of banknotes, surviving and new banks increase their provision in the 1863-66 period, with a negative contribution to the overall decline of 17%. Bankrupt banks account for one third of the overall decline while the Bank of Spain alone accounts for 85% of the decline. Also with respect to deposits, surviving and new banks largely increase their provision between 1863 and 1866. Bankrupt banks display a contribution of 9% to the overall decline while the Bank of Spain displays a decline which is 1.34 times the total.

From this picture, we can draw the following conclusions: i) the group of surviving and new banks managed to perform reasonably well during the crisis, with the amount of banknotes and deposit increased between 1863 and 1866. Part of this performance should be attributed to the small or null involvement of the banks of issue with each other and with the *sociedades de credito*, a fact that prevented contagion and implied that even banks created in the middle of the crisis performed well; ii) the decline in credit and banknotes due to liquidated banks is substantial (0.33 and 0.25 of the total, respectively), but this is almost entirely due to two banks (Sevilla and Cadiz) which displayed particularly weak balance sheet on the eve of the crisis; iii) the Bank of Spain alone accounts for

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<sup>20</sup> Blasco and Sudriá (2012, pp. 301-319).

32%, 85% and 133% of the decline in credit, banknotes and deposits. Thus, it represents the institute which fostered the largest part of the observed fluctuations in the system of banks of issue. This behavior was not the outcome of a plain bad management, but resulted from the large involvement of the bank with the Government. We devote the next section to detail this particular situation of the Bank of Spain.

## **7. The Bank of Spain during the crisis**

As discussed above, the behavior of the Bank of Spain during the crisis differs from that of the largest banks of issue that managed to survive it. In this section we argue that the involvement of the Bank of Spain with the Government explains this behavior.

During the period 1856-1864, the Bank of Spain became more involved in the financing of the Government. The various sovereign defaults of the previous decades, the last one in 1851, had closed the access to the London and Paris markets to the Spanish public debt. The consequence was that the Spanish Government had to rely more and more on the Bank of Spain to obtain resources to finance its program of subsidies to railways companies and its military expeditions to Morocco, Mexico, Indochina and Peru.

In 1864, the Government decided to directly involve the Bank of Spain in the policy of sale of public properties of the Disentailment. The sale receipts of the public properties were delivered to the Bank, which was in charge of their collect. For its part, the Bank of Spain created in June the Mortgage Bill (*billete hipotecario*), which was backed by those receipts. The whole amount obtained in the placement of the Mortgage Bills had to be transferred by the Bank to the Treasury.

However, the timing of the operation was quite unfortunate. The suspect that there was an excessive engagement of the Bank with the Treasury, perceived to be at the edge of insolvency, produced a bank run in which the public required, in a tumultuous way, the payment in specie of their bills. The situation of the Bank of Spain was untenable and the governing council of the Bank decided to limit the amount of banknotes that could be converted into specie each day. In the first seven months of 1864 the Bank experienced an outflow of specie in exchange for banknotes of 100 millions of pesetas, a dramatic amount, with roughly 25 millions in July.<sup>21</sup>

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<sup>21</sup> Tedde (2013).

Careless of the dire situation of the Bank, the Government prevented it from selling part of its portfolio of public assets in order to obtain additional liquidity. In addition, the decision in 1865 of the Spanish Government to instruct the trade courts to delay as much as possible all the cases involving convertibility of banknotes into metallic only made matters worse. This decision created a legal vacuum where convertibility was decided case by case, increasing the mistrust by the public in the banknotes of the Bank of Spain. The response of the Bank was to purchase bullion in the international markets, to increase the discount rate and to delay convertibility of banknotes. In addition, it increased its paid-up capital from 30 million pts to 50 in a couple of years (1864-1865).

In December 1865, the courts decided that the Bank of Spain was obliged to convert 50,000 pts in banknotes into specie to one of its customers, the Marquis of Santa Marta. The Bank announced that, in order to do so, it would be forced to sell part of its public assets. The tension between the Government and the Governing Council of the Bank ended with the resignation of the Governor of the Bank of Spain in March 1866.

In the spring of 1866, the Government proposed a new approach to solve its financing problems. The idea was to receive a loan of 100 million pesetas from an English bank syndicate in exchange for the rights of banknote emission in the whole country, that is, the suppression of the Bank of Spain and the rest of banks of issue and the creation of a new national bank of issue in the hands of the English bankers.<sup>22</sup> The plan was quite advantageous for the Government. First, it would reopen international capital markets to Spanish debt, as a major share of the loan was to be devoted to repay foreign bondholders. Second, some of the funds could be used to resume the payment of subsidies to the railways companies, in an attempt to mitigate the effects of the crisis. Third, the burden of the costs was to be placed on the shareholders of the local banks of issue, which would suffer most of the losses, though they were going to receive shares of the newly created national bank as compensation. Thus, this operation should not be regarded as a financial rescue of the banking system, which the Government was decided to let fall, but as a fiscal rescue of the Government itself. Naturally, the directors of the Bank of Spain strongly opposed the operation as it represented bankruptcy. However, the operation was aborted only after the failure of Overend and the financial panic of May 1866.

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<sup>22</sup> In contrast to what is commonly reported in the literature, it is not clear that Overend, Gurney and Co. was the head of the syndicate. See Tedde (2013) for a discussion on the issue.

To quantitatively analyze the behavior of the Bank of Spain, we have reconstructed its quarterly balance sheet for the period 1860Q1 to 1869Q4 by using the internal accounting of the Bank (*situacion general del Banco de España*) from its archives. Figure 13 shows the main components in the assets. First, it is evident that the operations of the Bank were mainly devoted to provide loans to the Government. The volume of discounted bills or credit to the private sector is remarkably small when compared to the amount of public assets. Second, the share of public assets in total assets of the Bank raises from 15.9 (23.7 million pts) in the last quarter of 1862 to 79.7 (173.8 million pts.) in the third quarter of 1864. This dramatic expansion was due, as explained above, to the sale receipts of public properties. The Bank managed to partially reduce its exposure to the public sector by 62 million pts. between 3Q1864 and 3Q1865. However, due to Government pressures, the share of public over total assets never fell below 58% during the crisis.<sup>23</sup>

In order to test the hypothesis that the exposure of the Bank of Spain to the public debt explains part of the pressure on its metallic reserves, we employ the share of public debt over the total amount of Bank's assets, the liquidity ratio and the reserve ratio.<sup>24</sup> The first series reflects the exposure of the Bank to the public debt whereas the last two indicators reflect its liquidity. We run an OLS regression of each ratio on the share of debt. Results are displayed in table 5. We consider two sub-periods, 1860-1870 and 1864-1870.<sup>25</sup> In all cases the intercept and the coefficient are highly significant. Also, the coefficient is negative both when considering the whole decade 1860-1870 and when considering only the crisis and its aftermath, though in this last case the coefficient has a larger magnitude and the  $R^2$  is also larger. These results support the argument that there was a negative correlation between the liquidity of the bank and the share of public debt over its portfolio in the period considered.

Figure 14 shows the main components in the liabilities of the Bank. First, note the increase in capital from 30 to 50 million pts. begun in 1Q1864 as a measure by the Governing Council to obtain new funds to cope with the sudden fall in cash that had begun in the last quarter of 1863. Also, the Bank requested and obtained several foreign loans at the beginning of the crisis. These were aimed at purchasing bullion in international markets. However, after the large amounts obtained in 1864, foreign borrowing declined steadily, as the Bank was not perceived as a safe

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<sup>23</sup> The records of the Governing Council meetings is discussed in Tedde (2013).

<sup>24</sup> The liquidity ratio is defined as reserves divided by liabilities, whereas the reserve ratio is reserves divided by the amount of banknotes. Data have been collected from the Bank of Spain archives.

<sup>25</sup> For the three series used in the regression we were able to reconstruct data up to 1870.

debtor and financial conditions across Europe were deteriorating. In October 1864 not even James Rothschild accepted to deal with the Bank's representatives.<sup>26</sup>

Deposits fell abruptly at the beginning of the crisis due to the mistrust in the Bank's liquidity (and solvency). Instead there had not been a similar move in banknotes, which remained at high levels until mid-1865. However, this is due to the fact that deposits were typically reimbursed in the form of banknotes and the convertibility of banknotes into metallic was largely impaired by the Bank in 1864. Once the exposure to the public sector began to decrease in early 1865, the Bank decided to reduce the volume of its banknotes in order to improve its liquidity ratios, a process which was accelerated in 1866 after the banking panic of May.

## 8. Conclusions

In this paper we provide a comprehensive analysis of the twin-crisis experienced by Spain in 1864-66. We described how the origins of the crisis can be traced back to the international financial crisis that affected European countries in those years. Then, we constructed a new dataset on capital inflows that allowed us to document how Spain experience a sudden stop during the crisis. Next, we studied the microeconomic behavior of banks of issue and find that they performed reasonably well during the crisis, with the safest banks enjoying a flight to quality effect from the *sociedades de credito*. Finally we reconstruct the quarterly accountancy of the Bank of Spain and show how, in this picture, this institute was the most destabilizing agent, due to a weak balance sheet resulting from its deep involvement in financing the Government. Thus, we regard the episode documented as a clear example of the effect of a twin-crisis on a financial system in which no public intervention is applied.

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<sup>26</sup> Tedde (2013).

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## Appendix A: Data sources

### *Net flows of foreign capital*

Gross flows of foreign capital are taken from several sources. For data about railway investments, we have consulted: Broder (1976, 1981) and Tedde (1978, pp. 9-354). For banking investments, data have been collected from Sánchez-Albornoz (1977), Tortella (1973), Broder (1976) and Tedde (1974). The information about mining and metallurgy foreign investments come, for the British sources, from Stone (1999), Harvey (1981) and Harvey and Taylor (1987). The French and Belgian data are drawn from Broder (1976, 1981) and from Chastagnaret (2000). We also have consulted Tortella (2008). For new issues of Public Debt along the period 1868-1874 data are taken from Martín-Niño (1973) and Fernández-Acha (1976). The foreign investment data of public utilities, like light and water urban services, come from Stone (1999) and Costa-Campí (1982).

These are all gross flows of foreign capital to the Spanish economy. However, we assume that there was no investment by Spanish residents in foreign countries and thus we set the gross outflows equal to zero in order to compute the net inflows.

### *Net payments to foreign capital*

We estimate payments to foreign capital from several sources. As in the case of the capital flows, we assume that the net payments equal the gross payments to foreign capital, i.e., we assume no Spanish investments in foreign countries.

In the case of railways we use data from Casares-Alonso (1973) and Tedde (1978) to estimate the volume of shares in the hands of foreigners. We use data from the Ministry of Public Works (*Ministerio de Fomento*) to assess the volume and the payments of debt instruments. In order to estimate the proportion of foreign capital in these debt instruments and the dividend payments, we use the annual balance sheets of the two major railways companies, the *Compañía de Caminos de Hierro del Norte de España* and Madrid-Zaragoza-Alicante (MZA), and assume that all railways companies paid equal dividends and have the same share of foreign debt.

In the case of banking we assume that the profitability of all the three largest *sociedades de crédito* which were French, was the same of the *Crédito Mobiliario Español* (the largest one), of which we have data from Sánchez-Albornoz (1977).

For mining and metallurgy profitability, following Prados de la Escosura (2010), we have taken the relative information from Harvey and Taylor (1987), which contains averages of dividend and interest payments for British investments. We have assumed that it can be acceptable to apply this rate of return to the French and Belgian investments in the same industry. The French and Belgian data are drawn from Broder (1976, 1981) and from Chastagnaret (2000).

Data about repayments of public debt are taken from Fernandez-Acha (1976) and Martín-Niño (1973). We assume that the repayment of public debt by the Spanish Treasury was made by repurchasing bonds in the stock market at current prices. This hypothesis is backed by Artola (1986) and Comín (1988). Finally, for the public utilities investments we have applied the same real rate of return as in the case of public debt.<sup>27</sup>

## **Appendix B: About the stock of gold and silver in Spain**

One of the most complex questions that arise in the reconstruction of the monetary aggregates of the Spanish economy in the 19th century regards the amount of metallic currency. In spite of the availability of reliable estimations of the volume of banknotes and the deposits in the local banks of issue, there are no annual series of the stock metallic currency. A potential candidate, the “Foreign Trade Statistics” (*Estadística del Comercio Exterior*) has been widely criticized in the literature as a valid estimation of the gold and silver flows.<sup>28</sup>

Tortella (1982) employs an alternative method to estimate the changes in the stock of metallic currency based on the sum of the net amount of gold, silver and copper minted every year. In order to compute the level of the stock, he chooses 1874 as the first year in which a reliable estimation of the stock exists and then proceeds backwards by subtracting the changes in the stock. This estimation has been accepted by Martín-Aceña and Pons (2005) in their statistical collection of Spanish monetary data and it is employed by Prados de la Escosura (2010) to compute the capital account.

Notwithstanding its appeal, the estimation based on mint data has an important drawback: as the amount of minted currency is always positive, this method implies that the currency stock is an increasing function of time. Therefore, the series of the stock of metallic currency grows steadily from 1833 to 1874. In the case of gold, for example, the estimated values are 392 million pesetas in

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<sup>27</sup> See Prados de la Escosura (2010, pp.12-13) to find a detailed description of his alternative methodology

<sup>28</sup> See Barroeta-Aldamar (1861), Tortella (1973) or Prados de la Escosura (2010).

1833, 471 in 1855 and 1537 1873. In contrast, the more reliable data for the period 1874-1900, displays more than 22 years in which there were reductions in the amount of metallic currency in Spain.<sup>29</sup> This change in the trend casts some doubts about the reliability of the mint-based method.

In addition, the historical writings of several contemporary observers of the period 1856-1873 such as Vázquez-Queipo (1861) or Santillan (1865) seem to oppose the view of an ever-growing metallic stock in Spain. In fact, according to these authors, the instability in the metallic currency was a major problem of the Spanish economy. In this line, Barthe (1908) estimates that between 1856 and 1866 there was a net outflow of silver of 308.6 million pts. According to the records of Governing Council of the Bank of Spain, the scarcity of specie of the Spanish economy forced the Bank to purchase in Paris and London more than 360 million pts of gold bullion between 1859 and 1870. This amounts to roughly half of the total amount of currency minted during the period. The outflow of specie was not a particular problem of Spain. The American Civil War and the increase in cotton imports from Egypt and China as well as the growth in British investment in India induced an outflow of silver from many European countries, as described in Flandreau (1999).

In the case of Spain, the drain of specie should be of no surprise given the particular circumstances at the time. In the first place, the misalignment of mint rations between gold and silver compared to market ones induced the outflow of silver coins. In the second place, despite the large capital inflows in railways companies between 1857 and 1863, there was an associated outflow of currency to purchase large amounts of iron and machinery due to the tariff exemption included in the Ley General de Ferrocarriles. In addition, the foreign investments generated an outflow of currency in the form of dividends and interest payments.

Finally, it should be stressed that this criticism against the mint-based method does not mean a criticism of the mint data itself, but only of the validity of this data as a proxy of the changes in the stock of metallic currency. The underlying assumption in this method is that there was every year a net positive inflow of specie equal to the amount new coins minted. As an alternative, in this paper we reconstruct the changes in stock of metallic currency using information from the current and the capital accounts in order to compute the net change in reserves. The stock is again computed backwards using the data from 1874 as the initial point.

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<sup>29</sup> See Martin-Aceña and Pons (2005), pp.678-0.

## **Appendix C: the Spanish experience under the light of the French crisis of 1846-48**

The Spanish banking system in the 1856-1874 period shares some similarities with that in France in 1817-1847. In France, under the encouragement of Governor of the Bank of France Jaques Laffitte, a system of regional banks of issue emerged after the Napoleonic Wars. These banks were constrained to issue notes only in their respective regions and to a limit of their liabilities of three times the amount of their metallic reserves. Despite the fact that their operations were mainly local in nature, they were quite successful in their departments. The Bank of France grew fearful of competition and began itself to open branches between 1841 and 1848, each branch given the monopoly of note issue in its own town.<sup>30</sup> This compares with the situation in Spain, where the Bank of Spain only opened two branches from 1856 to 1874 concentrating most of its activities in Madrid.

The French system came to an end in the crisis of 1846-48. During the political crisis, many people tried to hoard specie, thus producing a run on the banks. The Government gave *cours forcé* to the Bank of France and allowed it to issue notes for 100 frs. The regional banks were also given the same nominal facilities, but since their notes were legal tender only within their own respective localities, while those of the Bank of France were legal tender all over France, the circulation of the Bank of France gained an overwhelming ascendancy over that of the regional banks. Finally, the Bank of France refused to come to their rescue as a lender of last resort and pressed the Government not to renew their charters. After this crisis, the Bank of France was the only issuing bank in France.

In contrast to the French episode, in Spain the public trusted more the banknotes of most of the major local banks of issue than those of the Bank of Spain. Also in contrast, the banknotes of the Bank of Spain were never legal tender in the whole country during that period, only in Madrid, Valencia and Alicante.

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<sup>30</sup> See Kindleberger (1984, pp.103-108) and Smith (1936, 27-30).

## Tables and Figures

Table 1. Number of joint-stock banks(banks of issue, *Sociedades de Credito* and other institutions)

	Banks of issue	<i>Sociedades de Credito</i>	Total*
1856	4	6	13
1857	10	6	19
1858	10	7	20
1859	10	7	20
1860	11	8	22
1861	11	12	26
1862	12	17	32
1863	14	20	37
1864	21	34	57
1865	21	35	58
1866	21	32	54
1867	21	26	47
1868	20	21	41
1869	19	14	33
1870	16	14	30
1871	16	14	32
1872	16	14	34
1873	16	13	33

Source: Tortella, (1973, p. 9). Total includes other joint-stock banks but no *cajas de ahorros*

Table 2. Entries of foreign capital in the Spanish economy (1856-1873). Million of current pts.

	Railways	Banking	Mining	Industry	Other	Subtotal	Public Debt	Total
1856	21.3	42.3	3.0			66.6		<b>66.6</b>
1857	92.0	14.2	0.3			106.5		<b>106.5</b>
1858	144.7	11.7	0.3			156.7		<b>156.7</b>
1859	167.8	10.7	0.4			178.9		<b>178.9</b>
1860	190.3		0.3			190.6		<b>190.6</b>
1861	79.3	9.5	3.5			92.3		<b>92.3</b>
1862	216	5.7	3.5			225.2		<b>225.2</b>
1863	170.8	45.6	3.5			219.9		<b>219.9</b>
1864	112.5	-10.5	3.5			105.5		<b>105.5</b>
1865	20.9		6.3			27.2		<b>27.2</b>
1866	6.6		3.5			10.1		<b>10.1</b>
1867	17.5		3.5			21.0		<b>21.0</b>
1868	38.8	-27.1	3.5			15.2	356.5	<b>371.7</b>
1869	38.8	-10.6	4.1			32.3		<b>32.3</b>
1870	38.8	-31.5	3.5			10.8		<b>10.8</b>
1871	38.8		4.3	4.4		47.5		<b>47.5</b>
1872	31.1		12.6	13.2	8.4	65.3	217.2	<b>282.5</b>
1873	31.1	-11.3	28	53	7.4	108.2	236.3	<b>344.5</b>

Table 3. Payments to foreign capital of the Spanish economy (1856-1873). Million of current pts.

	Railways	Banking	Mining and Metallurgy	Others	Public Debt	Total
1850					50.3	<b>50.3</b>
1851			0.1		44.4	<b>44.5</b>
1852			0.1		43.2	<b>43.3</b>
1853			0.1		16.8	<b>16.9</b>
1854			0.2		16.8	<b>17.0</b>
1855			0.2		15.6	<b>15.8</b>
1856	-	3.9	0.6		16.4	<b>20.9</b>
1857	5.4	3.4	0.6		17	<b>26.4</b>
1858	10.9	15.5	0.6		18.4	<b>45.4</b>
1859	14.3	5.9	0.6		19.6	<b>40.4</b>
1860	18.7	7.9	0.7		19.3	<b>46.6</b>
1861	18.9	5.8	0.7		19.8	<b>45.2</b>
1862	19.6	14.6	1		19.9	<b>55.1</b>
1863	19.6	21.6	1.2		21.1	<b>63.5</b>
1864	9.8	13.0	1.5		21.1	<b>45.4</b>
1865	35.3	9.7	1.9		22.3	<b>69.2</b>
1866	33.6	4.9	2.2		22.3	<b>63.0</b>
1867	33.5		2.5		23.5	<b>59.5</b>
1868	31.7		2.7		38.7	<b>73.1</b>
1869	28.1	4.1	3		74.5	<b>109.7</b>
1870	34.0	5.6	3.3		74.5	<b>117.4</b>
1871	40.1	7.6	4.8	0.4	75.9	<b>128.8</b>
1872	40.2	7.6	6	2.1	91.5	<b>147.4</b>
1873	47.2	6.5	8.7	11.7	77.7	<b>151.8</b>
1874	48.9	14.0	9.9	20.8		<b>93.6</b>

Table 4. Decomposition of the performance of the system of Banks of Issue. Million of current pts.

	1863	1866	1866-1863	Percentage Change	Surviving banks	Bankrupt banks	Bank of Spain
Credit	191.1	168.4	-22.7	-0.12	0.43	0.25	0.32
Banknotes	117.8	89.8	-28.1	-0.24	-0.17	0.33	0.85
Deposits	76.4	47.3	-29.1	-0.38	-0.43	0.09	1.33

Table 5. Bank of Spain. Regressions between the share of Public Assets over Total Assets (independent variable) and the Liquidity and the Reserve ratios. Quarterly data 1860-1870. Standard errors in parenthesis. Source: Bank of Spain archives.

	Liquidity Ratio		Reserve Ratio	
	1860-1870	1864-1870	1860-1870	1864-1870
constant	41.40*** (4.96)	57.19*** (6.27)	98.33*** (11.84)	156.50*** (16.79)
coefficient	-0.28*** (0.09)	-0.54*** (0.11)	-0.95*** (0.22)	-1.88*** (0.29)
R <sup>2</sup>	0.19	0.50	0.31	0.62

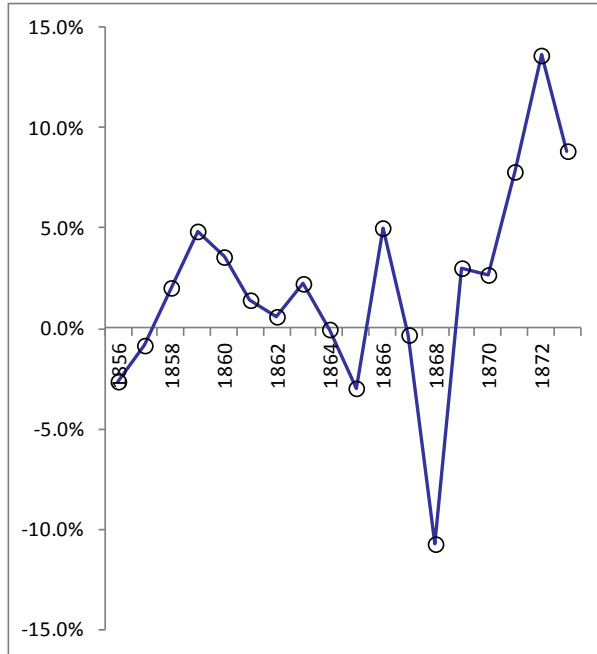


Figure 1: Real GDP growth rate in Spain (y-o-y) (1856-1873).  
Source: Prados de la Escosura (2003).

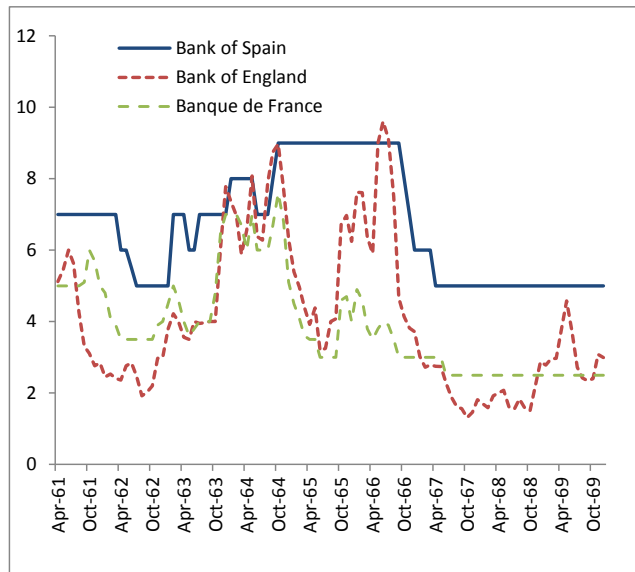


Figure 2: Discount rates (April 1861- December 1869).  
Source: NBER Macrohistory database and Bank of Spain archives.



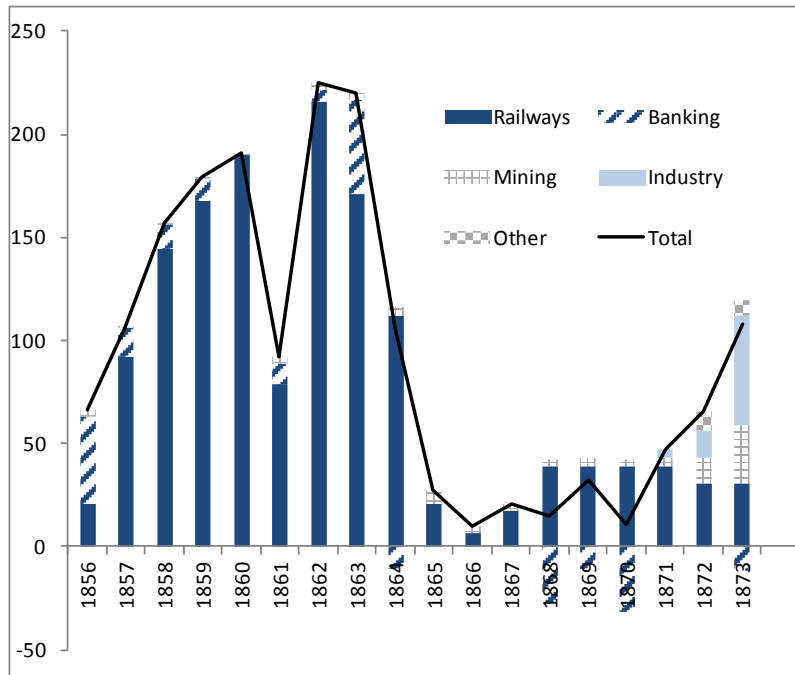


Figure 3: Entries of foreign capital in the Spanish economy (1856-1873), except public debt. Million of current pts. Source: See the text.

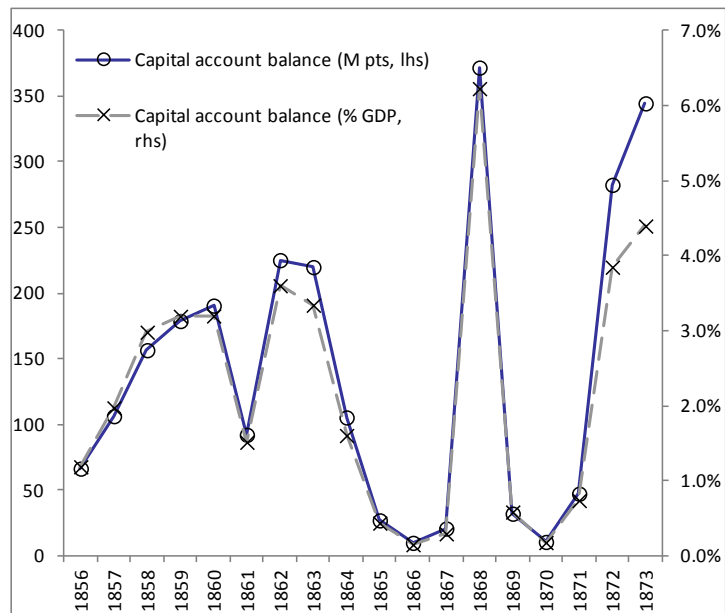


Figure 4: The capital account balance (1856-1873). Million of current pts (lhs) and % GDP (rhs). Source: See the text.

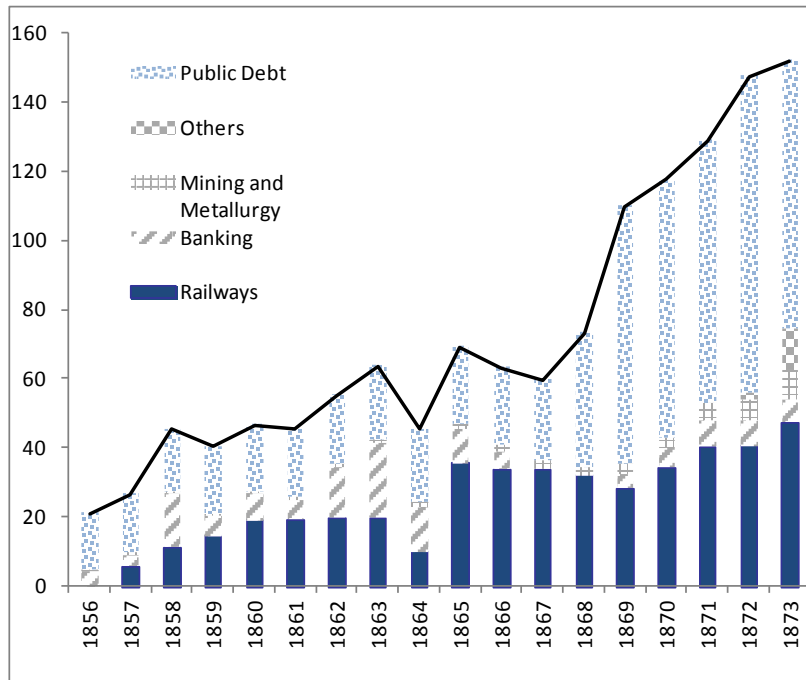


Figure 5: Payments to foreign capital of the Spanish economy (1856-1873). Million of current pts. Source: See the text.

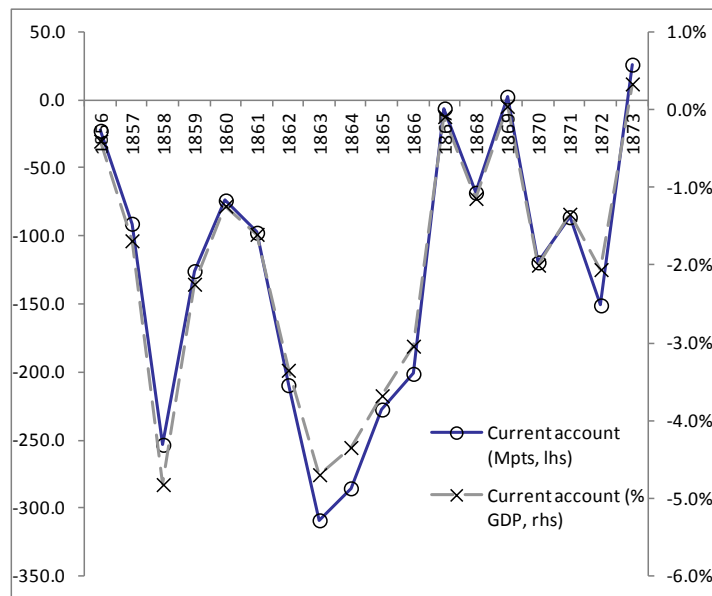


Figure 6: The current account balance (1856-1873) Million of current pts (lhs) and % GDP (rhs). Source: See the text.

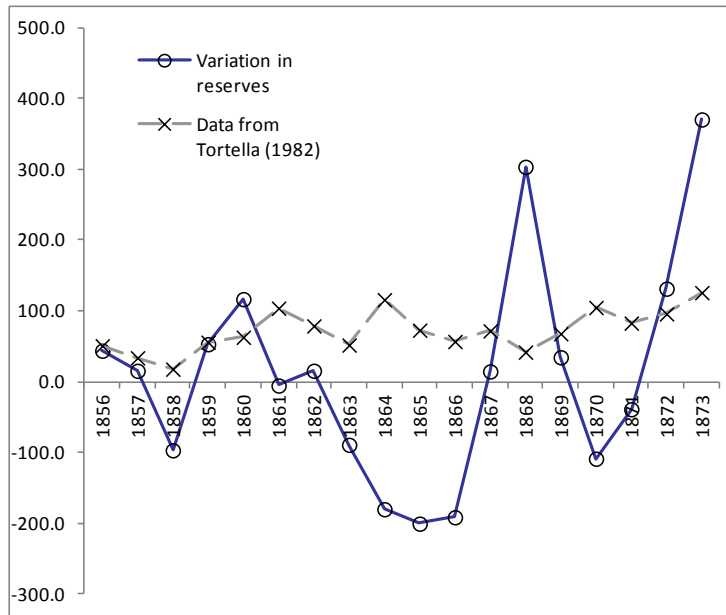


Figure 7: Variation in foreign reserves (1856-1873) compared to changes in the stock of metallic currency from Tortella (1982). Source: See the text.

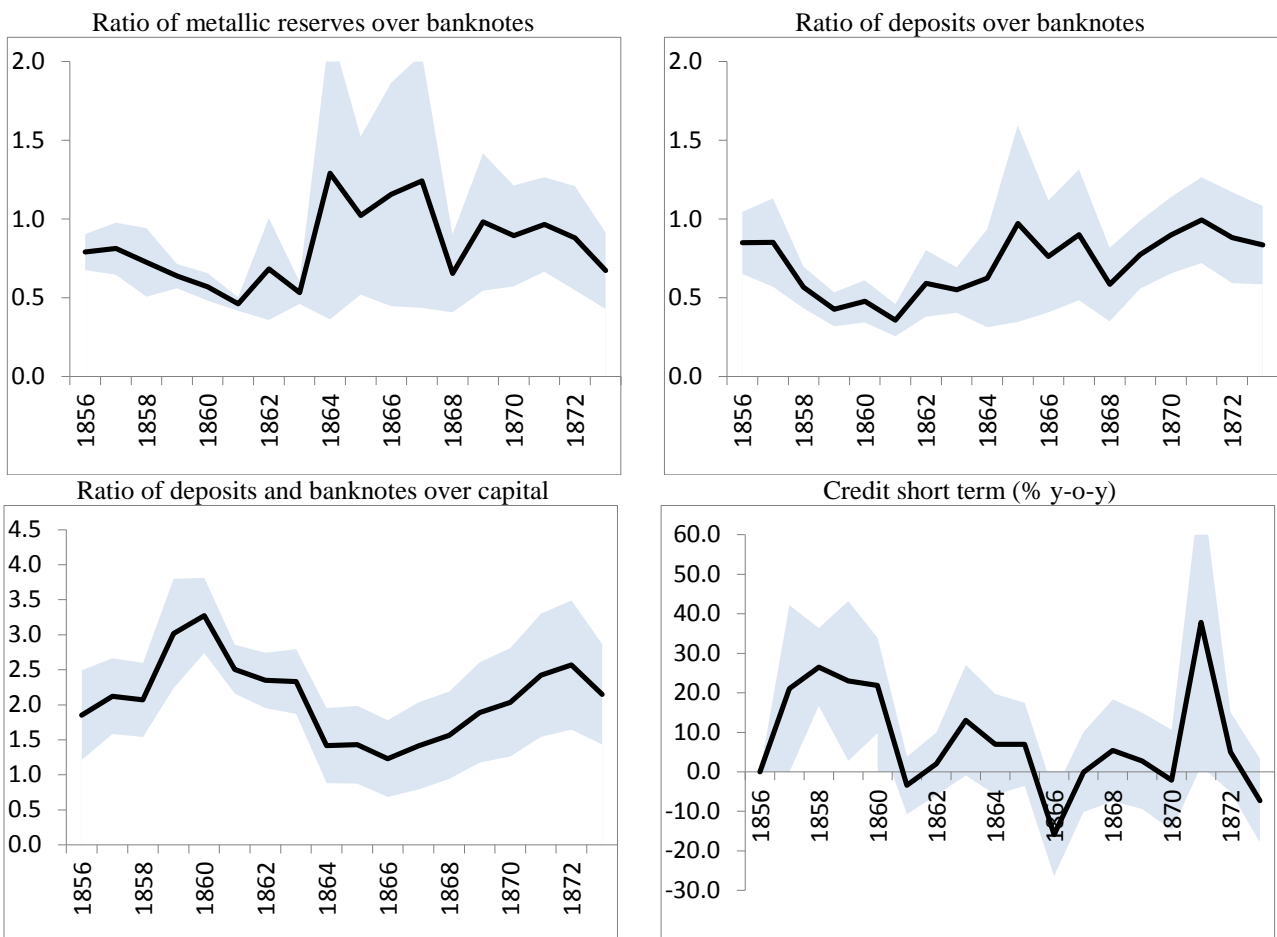


Figure 8: Average responses across banks of issues in the period 1856. The grey bands denote plus/minus half standard error around the average. Source: See the text.

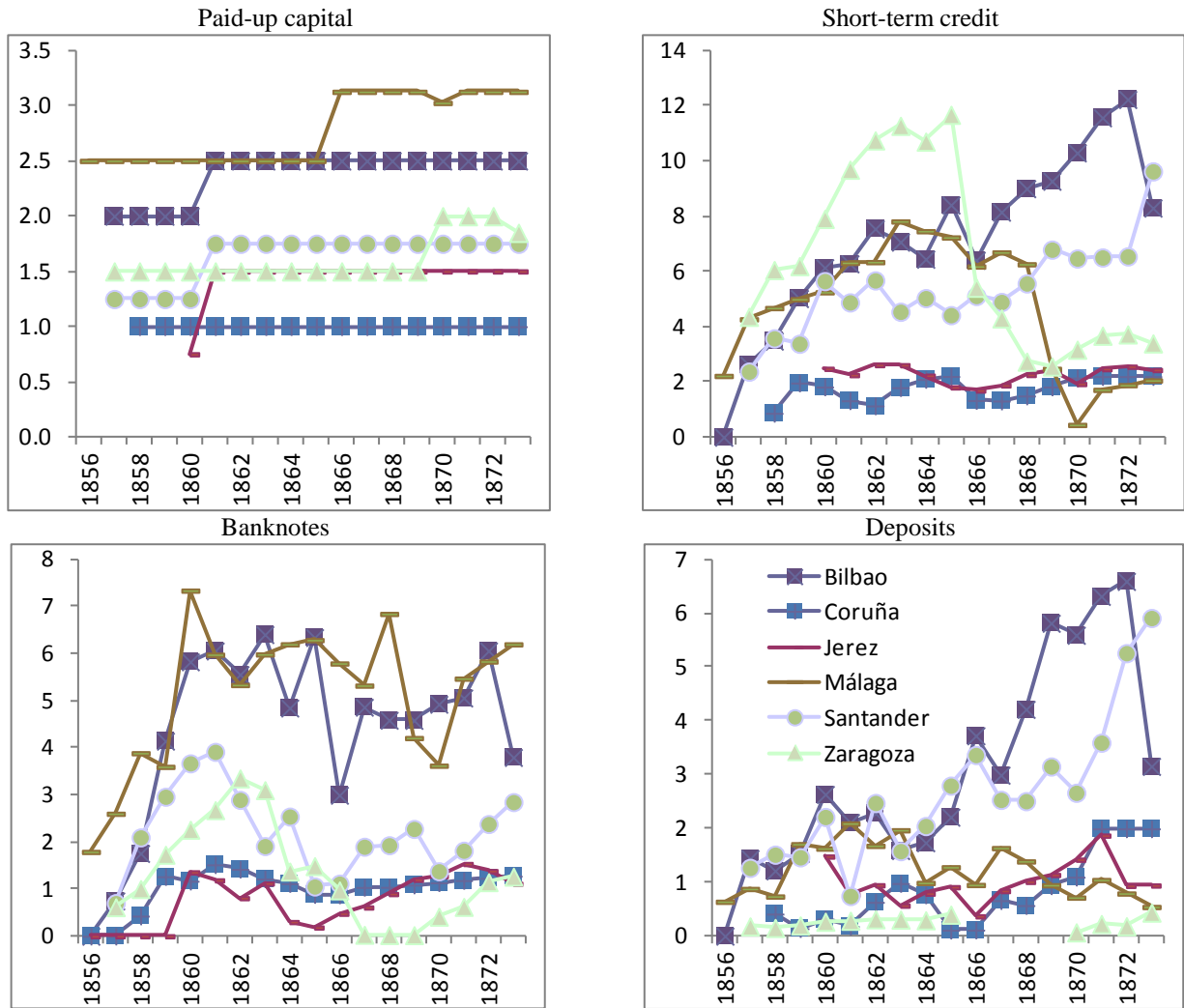


Figure 9: Type I banks (created before 1862 and not bankrupt during the crisis). Million pts. Source: P. Schwartz (1970), Appendix A.

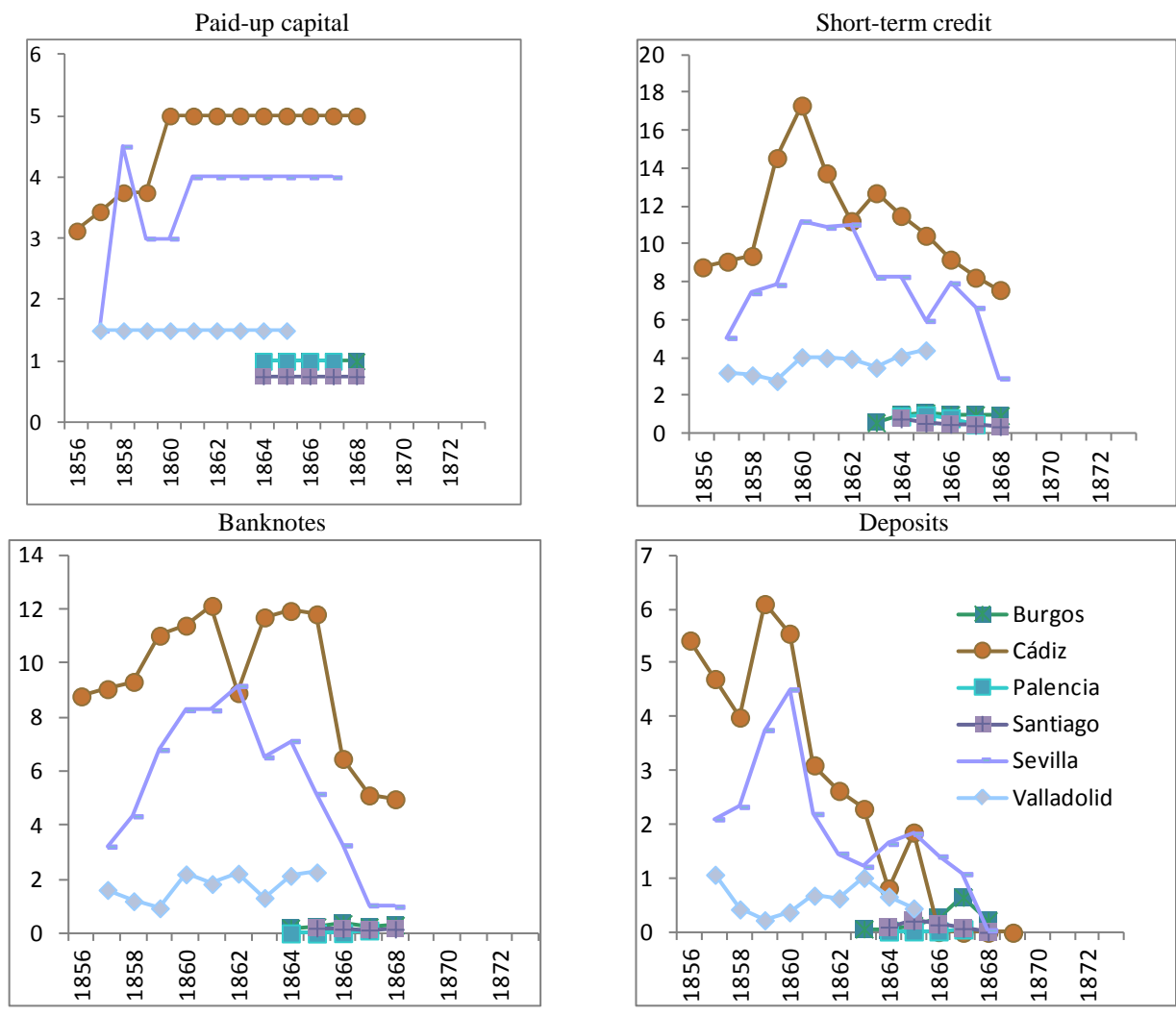


Figure 10: Type II banks (bankrupt during the crises). Million pts. Source: P. Schwartz (1970), Appendix A.

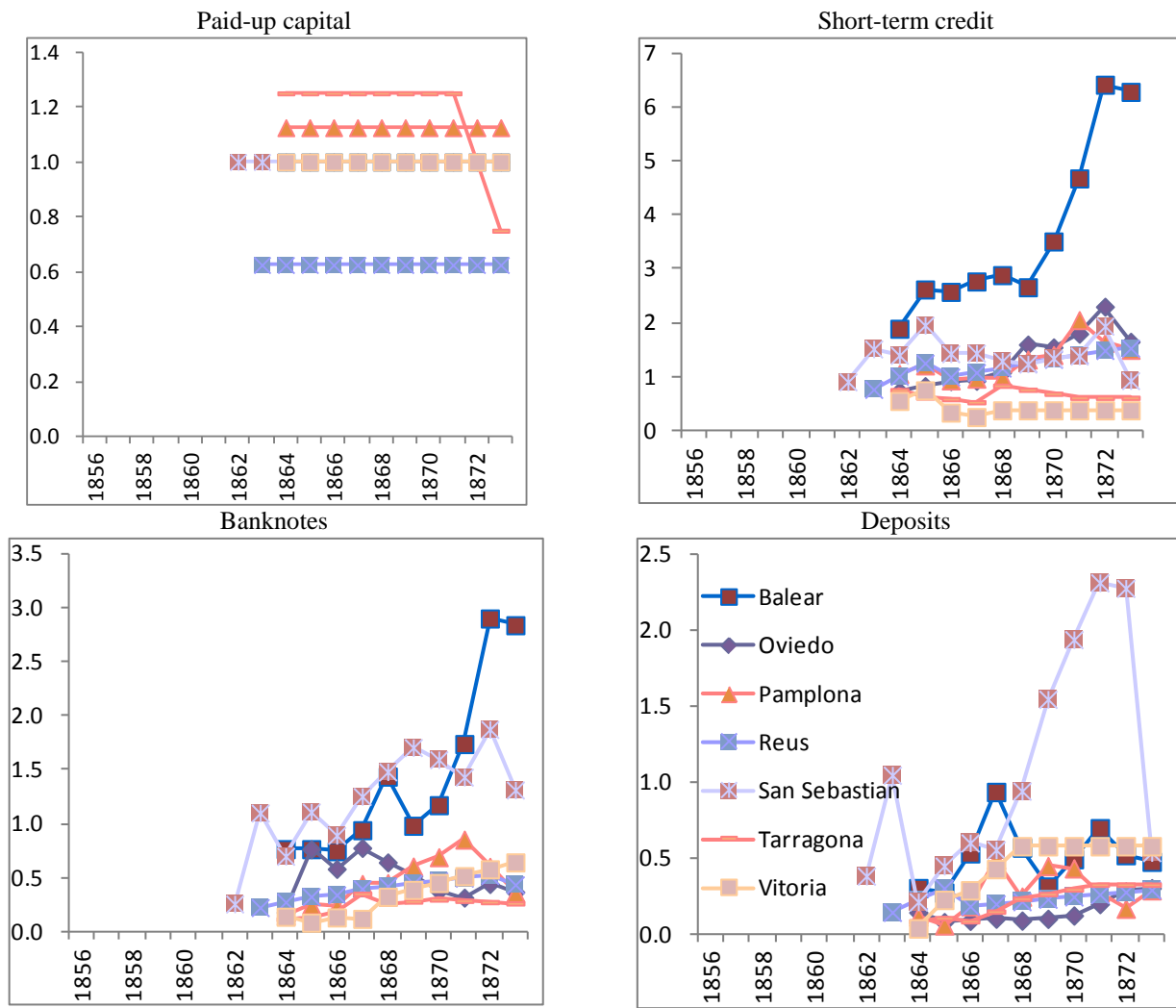


Figure 11: Type III banks (created after 1862 and not bankrupt during the crisis). Million pts. Source: P. Schwartz (1970), Appendix A.

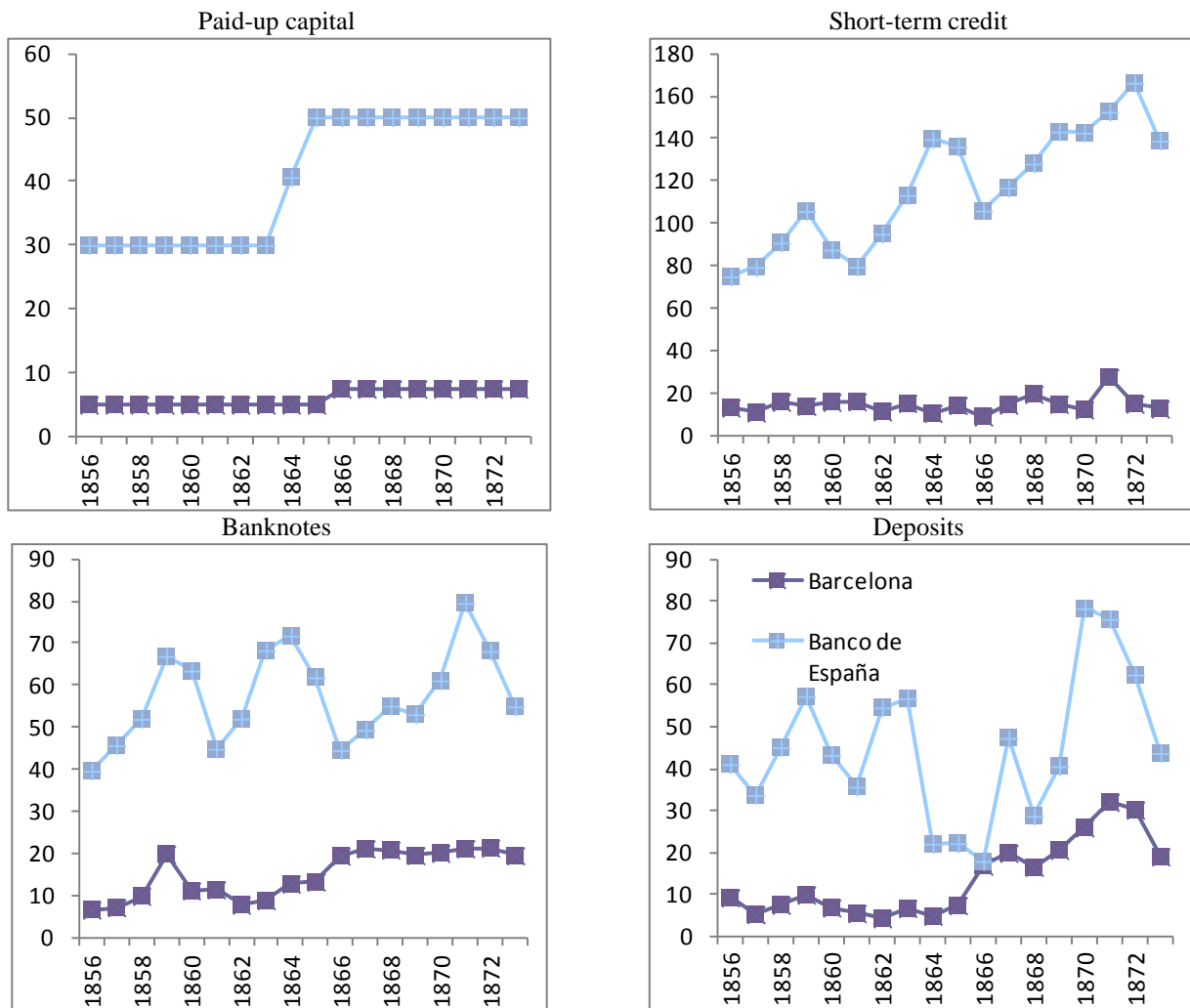


Figure 12: Type IV banks (large banks). Million pts. Source: P. Schwartz (1970), Appendix A.

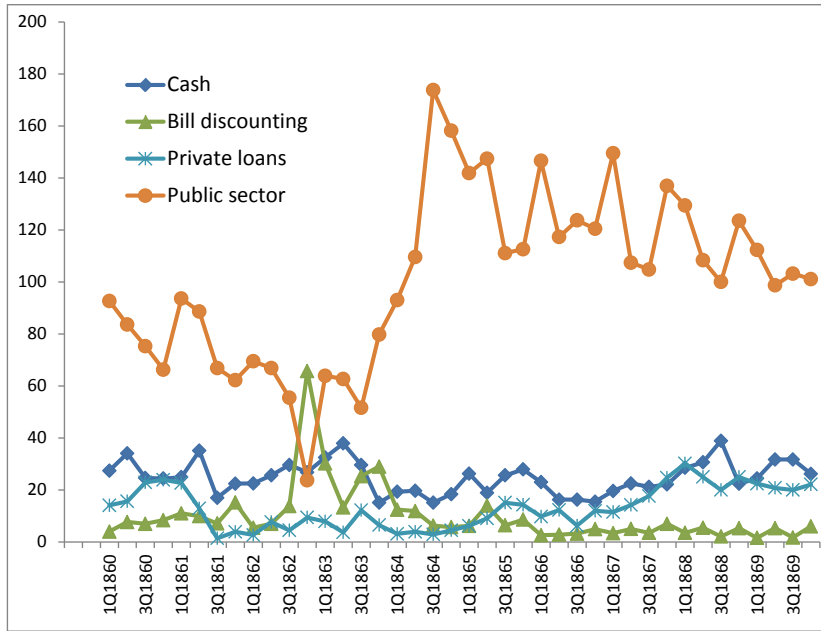


Figure 13: Bank of Spain's assets: main components. Million pts. Source Bank of Spain archives.

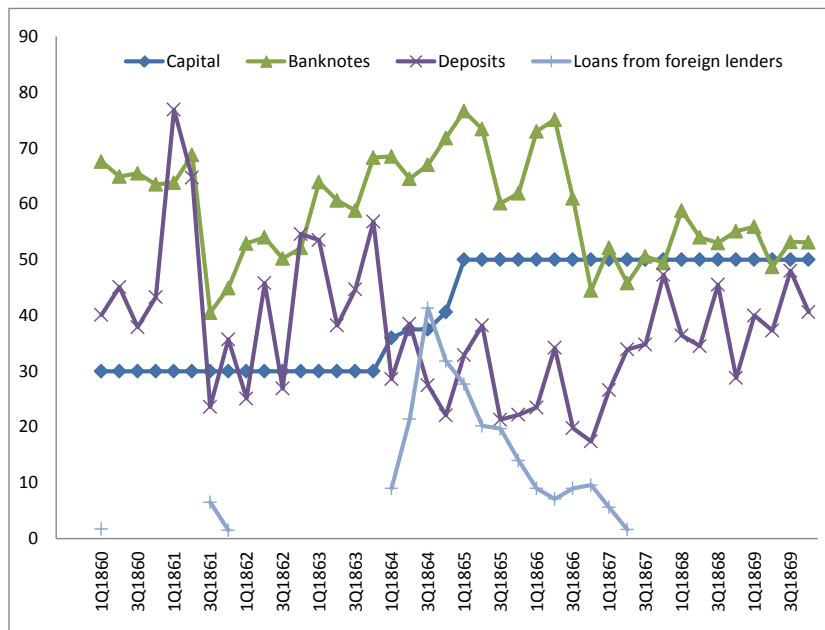


Figure 14: Bank of Spain's capital and liabilities: main components. Million pts. Source Bank of Spain archives.