



asociación española de historia económica

DOCUMENTOS DE TRABAJO

ISSN 2174-4912

FINANCIAL CRISES IN SPAIN: LESSONS FROM THE LAST 150 YEARS

Concha Betrán, Pablo Martín-Aceña and María A. Pons [∞]


DT-AEHE N°1106

www.aehe.net



asociación española de historia económica

September 2011

[∞]  This paper is protected by a Creative Commons licence: Attribution-NonCommercial- NonDerivativeWork. The details of the licence can be consulted here: <http://creativecommons.org/licenses/by-nc-nd/3.0/deed.en>.

FINANCIAL CRISES IN SPAIN: LESSONS FROM THE LAST 150 YEARSConcha Betrán⁺, Pablo Martín-Aceña[#] and María A. Pons ^{*}

AEHE DT-1106, September 2011

JEL: N2, G18

ABSTRACT

The financial disturbances that originated in the US in the second half of 2007 are the latest in a series of episodes in various regions of the world in recent years. However, financial crises are not unique to current financial systems, history being full of banking and exchange rate crises. Are crises alike? Do they share similar features or, on the contrary, are they strikingly distinct? Have they become more frequent, longer-lasting and more severe since the 20th century? Are we now living in a more vulnerable financial world? What does history tell us when comparing past and present crises? This paper chooses to address some of these questions for the case of Spain. The objective of this paper is to study the financial crises that have occurred in Spain over the last 150 years. Data are revised and different indicators constructed to identify financial crises. We consider all types of crises, namely currency, banking, stock market and debt crises and all their possible combinations, estimate their frequency by period and measure their length and depth. The Spanish case is compared to the results obtained for multi-country analyses in order to test whether the general conclusions obtained in those papers hold for one sole country. Finally, we perform an analysis of the main financial crises in order to establish hypotheses that could be tested in future research. .

Keywords: financial crises, currency, banking, stock market and debt crises, Spanish banking history.

RESUMEN

Los problemas financieros originados en EEUU en la segunda mitad del 2007 son el último de toda una serie de episodios que se han producido en distintas partes del mundo en los últimos años. Sin embargo, las crisis financieras no son exclusivas de los sistemas financieros actuales ya que la historia está repleta de crisis bancarias y cambiarias. ¿Son todas las crisis iguales?, ¿tienen rasgos comunes o, por el contrario, están claramente diferenciadas?, ¿han sido más frecuentes, de mayor duración y más severas a lo largo del siglo XX?, ¿vivimos actualmente en un mundo financieramente más vulnerable?, ¿qué nos dice la historia cuando comparamos las crisis financieras en el pasado y el presente? Este trabajo estudia las crisis financieras que han tenido lugar en España en los últimos 150 años. Se han revisado los datos y construido diferentes indicadores para identificar las principales crisis financieras. Se han considerado todos los tipos de crisis: cambiarias, bancarias, bursátiles y de deuda y todas sus posibles combinaciones, se ha estimado su frecuencia por periodos y se ha medido su duración y profundidad. Se ha comparado el caso español con los resultados obtenidos en otros estudios realizados para muchos países con objeto de contrastar si las conclusiones generales obtenidas en esos trabajos se mantienen para un solo país. Finalmente, se han deducido algunas hipótesis a contrastar en futuros trabajos de investigación.

Palabras clave: crisis financieras, moneda, banca, mercado financiero y crisis de deuda, historia bancaria Española

⁺ Universidad de Valencia, concepcion.betran@uv.es

[#] Universidad de Alcalá-Madrid, pablo.martin@uah.es

^{*} Universidad de Valencia, angeles.pons@uv.es

FINANCIAL CRISES IN SPAIN: LESSONS FROM THE LAST 150 YEARS*

"You study history. Can you tell us, then, whether the crisis problem is growing more severe?"
Lawrence Summer. Former US Deputy Treasury Secretary (quoted in Eichengreen and Bordo, 2003, p.72)

1. Introduction

The current financial crisis is one of the dominant macroeconomic features of our era. The financial disturbances that originated in the US in the second half of 2007 with the failure of Bear Stearns, and then in 2008 with the catastrophic bankruptcy of Lehman Brothers, are the latest in a series of episodes in various regions of the world in recent years. As recently as the 1990s, currency and financial crises have occurred in Europe (the breakdown of the European Monetary System's exchange rate mechanism and the Russian suspension of its foreign debt), Latin America (the tequila crisis in Mexico and the Brazilian currency collapse) and East Asia (Indonesia, Korea, Malaysia, the Philippines and Thailand). All of these crises have been costly to varying degrees, both in terms of loss of output and fiscal and quasi-fiscal outlays to shore up fragile financial sectors. However, financial crises are not unique to current financial systems, history being full of banking and exchange rate crises. For those who have studied the history of money over the very long term, financial crises are not a surprising phenomenon at all. Since Schumpeter's "Business Cycles" (1939), we have known that financial turmoil is inextricably associated to modern capitalist development. Financial instability and crises are part of economic life, as stated by Minsky (1977). Chancellor (1999), in his book on financial speculation, documented how financial crises have stretched back at least as far as Ancient Rome during the second century BC. Kindleberger (2000) provided a list of financial crises dating back to the tulip mania of 1636 in Holland up to the Asian crisis of 1997 and the subsequent Russian and Brazilian crises in 1998. Goodhart and Delargy (1998) created a useful table of international stock exchange shocks between 1873 and 1932 for major countries, characterising each shock according to size and international impact. Bordo (1986) also provided a catalogue of crises, distinguishing between banking crises that interrupt the internal payment system

* This paper has received financial support from the Spanish Ministry of Science and Innovation ECO2009-08791. Previous versions of this paper have been presented at the EHES (Geneva, August 2009), CLADHE-II/AMHE-IV (Mexico, February, 2010), V Iberometrics (Barcelona, March 2011) and 7th BETA-Workshop in Historical Economics (Strasburg, May 2011) congresses. We would like to thank all the participants and discussants for their comments. We are especially grateful to Joaquim Voth, Matthias Morys and Lyndon Moore for their comments.

and currency crises that disrupt external payment relations. More recently, Reinhart and Rogoff (2008) constructed an impressive dataset of banking and financial crises around the entire world dating back to 1800. Hence, from a historical viewpoint, crises are depressingly familiar. The only distinguishing feature of the financial crises in the twentieth century is perhaps that they continue to occur despite vigorous attempts to strengthen international financial architecture at a time when our understanding of nominal variables, financial markets and banking structures is much greater.

Are all crises alike? Do they share similar features or, on the contrary, are they strikingly distinct? Have they become more frequent, longer-lasting and more severe since the 20th century? Are we now living in a more vulnerable financial world? Have crises become more systemic? Is the crisis problem growing more severe? What does history tell us when comparing past and present crises?

All of the above are of course relevant questions that merit an answer, some of which have already been closely studied by a handful of scholars. This paper chooses to address some of these questions for the case of Spain. More specifically, the objective of this paper is to study the financial crises that have occurred in Spain over the last 150 years. Although this study is confined to a single country, we believe it is worth examining a country-specific historical experience in depth. Firstly, it is difficult to compile detailed and high quality data when a large sample of countries is considered. In contrast, single country analyses make it possible to use the best available data for a country. Secondly, such studies can perform in-depth analyses in order to obtain empirical hypotheses regarding the main determinants of financial crises.

Another unique feature of this paper is that it considers all types of financial crises and their combinations: currency, banking and stock market and debt crises. A study is carried out to ascertain whether one type of crisis has become more or less prevalent and also any possible interaction among crises. This is a new approach in regard to other studies, which consider banking and currency crises and the combination of the two on the one hand, and stock market crises on the other. This paper aims to determine the number of crises that have occurred and document their anatomy, that is, their frequency, duration and depth (or the output losses incurred) by constructing a financial database for the period 1850-2000.

An underdeveloped nation in the 19th century, Spain has evolved into an emerging nation and finally a developed nation in the 20th century. Obviously, this progress has not made Spain exempt from the various types of crises. Many of the

bankruptcy and currency shocks in the world have had repercussions in the Spanish economy. On many occasions, crises have coincided, while on others they have not. This paper establishes the chronology of Spanish financial crises and compares the Spanish case to the general pattern obtained in other papers, such as Bordo, Eichengreen, Klingebiel and Martínez-Peria (BEKM 2001), Eichengreen and Bordo (2003), Reinhart and Rogoff (2008, 2010) or Barro and Ursúa (2009) for a large sample of countries.

As indicated above, this study aims to ascertain whether financial crises have become more frequent and more damaging to the economy. In order to tackle this topic, the approach taken in BEKM (2001) and Eichengreen and Bordo (2003) was taken. These papers sought to find out whether crises were becoming more severe, especially in today's world of capital globalisation. BEKM (2001) addressed this topic by distinguishing between banking, currency and twin crises. These authors studied a 21-country sample that included Spain between 1880 and 1997, finding that twice as many crises had occurred since 1973 as in the Bretton Woods and classical gold standard periods, being rivalled only by the crisis-ridden 1920s and 1930s. However, they also found that crises, albeit more frequent, have not been either longer or more serious in terms of output losses. This paper intends to verify whether crises have become more recurrent and more severe in Spain and whether or not Spanish crises follow international patterns. For instance, do the results obtained in BEKM hold for Spain? Is the Spanish case different to the norm?

As in BEKM, the sample period has been divided into four sub-periods in order to compare the most recent years (1973-2000) to more than a century of financial and stock market crises, distinguishing the Bretton Woods period (1945-71), the interwar years (1919-39) and the long second half of the 19th century (1850-1913)². As Spain has progressed from being a backward nation to an emerging and later industrial nation over the four periods under study, the aim of this paper is to clarify whether or not financial instability has become more systemic, distressing and costly as the country's per capita income has risen. Also, as in BEKM, the comparison effected focuses on three issues: the frequency, duration and depth of crises. The question is posed whether crises have

² The interwar period in this paper begins in 1914 and ends in 1936 because Spain did not participate in WWI, but did suffer a civil war between July 1936 and 1939. Consequently, the Bretton Woods period dates from 1940 to 1971 for the same reason.

been influenced by changes in the type of monetary regime or by changes in financial regulatory framework.

As mentioned previously, the paper considers not only currency and banking crises, but also stock market and debt crises and all their possible combinations. Barro and Ursúa (2009) analysed stock market crises and economic depressions from 1870 up to the present for a large sample of countries (25 in total), also including the case of Spain. They found that larger depressions are likely to be accompanied by stock market crises and that a depression is highly unlikely without a stock market crisis. We replicate the comparison in this paper for the Spanish economy, matching stock market crises and depressions. Finally, Reinhart and Rogoff (2010) considered the importance of debt crises or “sovereign defaults”. Using a large database comprising 66 countries to study debt and banking crises, inflation and currency crises, these authors found that banking crises often precede or accompany sovereign debt crises. The database used in this research also includes debt crises.

In summary, the first contribution this paper makes is to study Spanish financial crises over the last 150 years. Data are revised and different indicators constructed to identify financial crises. The second contribution of the paper is that it considers all types of crises, namely currency, banking, stock market and debt crises and all their possible combinations. Finally, the Spanish case is compared to the results obtained for multi-country analyses in order to test whether the general conclusions obtained in those papers hold for one sole country.

The first five sections detail the methodology used to identify the crises and discuss the main features of the data. Section 2 concentrates on currency crises and Section 3 examines banking crises. Section 4 analyses currency and banking crises and the combination of both (hereafter referred to as twin 1) and compares the results to those obtained in BEKM (2001). Section 5 studies stock market crises and performs a similar exercise to that in Barro and Ursúa (2009) by analysing whether stock market crises coincide with economic depressions and the probability of stock market crises and depressions. Section 6 focuses on debt crises. Following this, Section 7 explores whether or not all the crises (currency, banking and stock market crises and a combination of them) have become more frequent in Spain and compares the Spanish and international experiences. The paper also examines whether the crisis problem has grown more severe as Spain has risen from an emerging to an industrial nation. Section 8 draws some general conclusions and proposes future lines of research.

2. Currency crises

Definition

A currency crisis may be said to occur when a speculative attack on the exchange value of a currency results in a devaluation (or sharp depreciation) of the currency, or forces authorities to defend the currency by spending large amounts of international reserves or sharply raising interest rates. The simplest indicator of a currency crisis is exchange rate depreciation. For example, Frankel, and Rose (1996) define a “currency crash” as a nominal depreciation of the currency of at least 25 percent in a year, along with a 10 percent increase in the rate of depreciation³ on the previous year. In this same line, Reinhart and Rogoff (2008b) identify a currency crisis as an annual depreciation of 15% or more of a currency with respect to a relevant anchor currency or a reference country, such as the US dollar, the UK pound, the French franc or the German DM, or presently the euro. However, as Eichengreen et al (1997) point out, currency crises cannot be identified using actual devaluations because speculative attacks are not always successful and authorities can support the currency by spending Central Bank reserves or raising interest rates. For this reason, they constructed a more sophisticated index that not only considers exchange rate changes, but also movements in international reserves or interest rate changes. Eichengreen et al (1996, 1997) defined the index of currency pressure as a weighted index made up of relative changes in the nominal exchange rate, international reserves and interest rates. All the variables in their index are relative to a reference country and the weights are intended to offset the differences in volatility of each variable.

The index of market pressure is as follows:

$$EMP_{it} = [(\alpha \% \Delta e_{it}) + (\beta \Delta (i_{it} - i_{at}) - (\gamma (\% \Delta r_{it} - \% \Delta r_{at}))]$$

where e_{it} is the exchange rate of a currency with respect to an anchor currency, i_t is the short term interest rate of the country considered, i_{at} is the short term interest rate of an anchor country and r is the ratio of reserves (R) to narrow money (M1).

These authors define a crisis as an extreme value of this index:

³ This second condition is included so as to omit the strong trend of depreciations in high-inflation countries from currency crashes.

$$\text{Crisis}_{it} = 1 \text{ if } \text{EMP}_{it} > 1.5 \sigma_{\text{EMP}} + \mu_{\text{EMP}}$$

where σ_{EMP} and μ_{EMP} are the sample mean and standard deviation of EMP respectively. Although most studies of currency exchange crises in the 20th century employ this indicator, this consensus is less clear in long term analyses. For example, Kaminsky and Reinhart's (1999) analysis of currency and banking crises for 20 countries in Asia, Europe, Latin America and the Middle East from 1970 to 1995 excluded interest rate differentials and comparisons to a reference country, considering only exchange rate variations because of the lack of interest rate data for some countries. Reinhart and Rogoff (2008) focus exclusively on exchange rate depreciation.

Although this paper considers the EMP index in Eichengreen et al (1997) to be the right procedure to determine currency crashes, there are several difficulties in calculating it. The main problem is obtaining appropriate data for all the required variables. In this sense, in order to identify the main currency crises, a comparison is made between the results obtained using exchange rate variations, an unweighted EMP index⁴ and a weighted EMP index⁵. Quantitative data have also been combined with the information supplied by the literature. All data procedures and sources are included in the data appendix.

Main Results

As indicated above, a comparison was made between the results obtained using exchange rate variations, an unweighted EMP and a weighted EMP. Quantitative data were also combined with other qualitative information. When using exchange rate variations, a currency crash was considered a nominal depreciation of the currency of at least 15 percent in a year. When a currency crisis appears in consecutive years, it is treated as one sole currency crash. According to these criteria, exchange rate variations show 8 currency crises (and another which is on the limit of acceptance) using the Carreras and Tafunell (2003) series and 11 currency crises (plus two on the limit of acceptance) using the £/pts exchange rate from 1850 to 1913 and the \$/pts exchange rate

⁴ The Eichengreen et al (1996, 1997) index weights the variables by the ratio of the inverse of their variation, but Li, Rajan and Willett (2006) consider that these weights have no clear economic interpretation, preferring to assign equal weights. According to these authors, the weights would depend on the exchange rate regime (fixed or floating) and precise weights are a combination of market volatility and policy reaction functions.

⁵ The weighted EMP was estimated using the same weights over the period and different weights for four periods (1882-1913, 1914-1935, 1942-1971 and 1972-2000).

from 1914 to 2000. The crises identified by both indexes were in 1898, 1921, 1931, 1950-51, 1957-1959 and 1983.

Using the weighted EMP and the same weights for the entire period, only 4 currency crises are identified⁶. The results are not very different to those obtained using the unweighted EMP index, which identifies 6 currency crises, another being on the limit of acceptance. If the weights are changed and different in the four sub periods the sample is divided into (1882-1913, 1914-1935, 1942-1971 and 1972-2000), the number of currency crises is higher. Without considering the 1914-1930 period⁷, 5 crises are identified and 4 more would be on the limit of acceptance. If the 1914-1930 period is included, estimates yield 6 currency crises plus 4 on the limit of acceptance. In this case, the EMP captures currency crises in 1883, 1899, 1930, 1943, 1974-75 and 1991, while the following are on the limit of acceptance: 1892, 1954, 1958 and 1962. In comparison to the literature, the weighted EMP index, using different weights in the four periods, appears to capture the currency crises better. Some of these crises are also captured by exchange rate variations, in particular 1899 (which this indicator situates in 1898), 1930 and 1943 (1942 according to exchange rate variations). In the case of 1958 (which would be 1957-1959 in the case of exchange rate variations), the situation would be on the limit of acceptance in both cases.

Finally, the results were tested by revising the main Spanish literature on currency crises. References were found for the 1883 and 1899 currency crises (although Sardá (1948) speaks about 1882 and 1898) and those in 1930 (Palafox 1991, Carreras and Tafunell 2003, etc), 1957-58 (Serrano Sanz and Castillo 1997) and 1991 (that Serrano Sanz 2006 or Fernández 2000 consider in 1992). Other currency crises referred to in the literature, but not tested by the EMP index are 1948-1951 (Serrano Sanz and Castillo 1997), 1977 (Serrano Sanz 2006) and 1995 (Fernández 2000).

Summarising all this information, the following currency crises are considered: 1883⁸, 1899, 1930⁹, 1943, 1958, 1974-75¹⁰, 1982, 1991 and 1995. For Spain, using a

⁶ A total of four crises are obtained when the 1914-1930 period is excluded (when there are no data on the variation of reserves for Spain) and when estimates of reserve variations from Martin-Aceña (1985) are used for this period, one further crisis is found to be on the limit of acceptance.

⁷ As mentioned in the previous footnote, we compare results both including and excluding the 1914-1930 period because there is an interruption in the reserves series.

⁸ A significant banking crisis occurred in 1882, as we will see in the next section, but for practical purposes it will be considered a twin crisis (currency and banking crisis).

⁹ As in the 1883 crisis, the crisis in 1931 will also be treated as a twin crisis (currency and banking) for practical purposes, as there was also a banking crisis that year.

weighted EMP for a broad sample of countries and other qualitative information, Bordo et al (2001) identified currency crises for the 20th century in 1931-32, 1958, 1967, 1971, 1976, 1982, 1992 and 1995. Therefore, results do not entirely coincide. The detailed results obtained by the various indicators used are presented in Table 1.

3. Banking crisis

Definition

A banking crisis entails financial distress that erodes banking system capital (BEKM 2001). In most cases, banking crises involve bank runs or failures that force the government to intervene. Banking crises are difficult to identify empirically, partly because of the nature of the problem and partly because of the lack of relevant data (IMF, 1998). As regards the definition of an actual crisis, Dermiguc-Kunt and Detriagiache (1998) consider that there is a banking crisis when the ratio of nonperforming assets to total assets in the banking system exceeds 10%, the cost of the rescue operation is at least 2% of GDP, banking sector problems result in a large scale nationalisation of banks and extensive bank runs take place or emergency measures such as deposit freezes, prolonged bank holidays or generalised deposit guarantees are enacted by the government in response to the crisis. However, as Reinhart and Rogoff (2008a&b) indicate, it is difficult to employ this approach in a historical analysis. Although data on bank deposits are readily available for most countries and could therefore be used to identify crises associated with runs on banks, most banking problems in recent years have not derived from the liability side of bank balance sheets. Banking crises generally stem from the assets side of bank balance sheets -from a protracted deterioration in asset quality. The problem is that variables such as the share of nonperforming loans in bank portfolios or other indicators of business failure are not readily available or are incomplete for many countries. Given these limitations, banking crises have usually been dated by researchers on the basis of a combination of events, such as the forced closure, merger, or government takeover of financial institutions,

¹⁰ Although the EMP identifies a currency crisis in 1974-75, Bordo et al (2001) and the Spanish literature consider that there was a currency crisis between 1976 and 1977 together with a banking crisis, for which reason 1976 will be considered a twin crisis.

runs on banks, or the extension of government assistance to one or more financial institutions.

This paper uses both quantitative and qualitative information in order to identify the main Spanish banking crises. In this sense, the following quantitative indicators are used: firstly, real bank stock prices. The peak-to-trough method is used and a crisis is defined as cumulative, multi-year returns of -0.25 . As Reinhart and Rogoff (2008b) indicate, “the relative price of bank stocks would be a logical indicator”. However, they did not use that indicator due to lacking data for most of the countries in the sample. However, data are available on real bank stock prices for three markets in Spain (Barcelona, Bilbao and Madrid) and this can be a useful indicator of banking crises. Secondly, the number of banks and bankruptcies and the name and size of banks that have closed, merged or been taken over by the public sector. Thirdly, a significant fall in real banking profitability is used to identify crises. The fourth indicator this research uses is the changes in bank deposits, a crisis being identified when a significant change is observed that could indicate a bank run. Finally, other complementary ratios are considered, including credits and loans/GDP and credit and loans/deposits. See data appendix for definitions and sources.

Main results

In reference to banking crises, the Spanish literature mentions the following between 1850 and 2000: 1866, 1881-1882, 1890, 1913-1914, 1920-1921, 1924-1925, 1931 and 1976-1977. As can be seen in Table 2, the indicators used identify these crises, with the exception of the 1920 crisis, which can only be detected in the analysis of the number of banks and the change in deposits¹¹. As a result, eight banking crises are identified over that period¹². Some of those banking crises coincided with international banking crises. More specifically, the 1866 crisis was linked to the failure of a discount bank (Overend, Gurney and Company) in London, the 1881-82 crisis was associated to the so-called "febre d'or" (gold fever) that broke out in Barcelona, the crash of 1890 was linked to the international crisis caused by the Argentine Republic going into default and its impact on the Baring Brother finance house and the London

¹¹ For more information on banking crises, see Martin-Aceña, Pons and Betrán (2009a,b) and for the 1866 crisis, see Navas and Sudriá (2007).

¹² Reinhart and Rogoff (2009) do not consider the crises in 1866 or 1881-1882. The war period between 1936 and 1939 was also excluded from the sample period.

financial market and the 1931 crisis was connected to the spread of the Great Depression. Figures 1, 2.1, 2.2, 2.3, 3 and 4 and Table 3 illustrate the trends of the main banking indicators used in this research: real banking profitability, change in deposits and the ratios of credit and loans/deposits and credit and loans /GDP.

4. A combination of currency and banking crises

Frequency of currency, banking and twin crises

In addition to these two single types of crises (currency and banking), another type combining the elements of both has been calculated. This exercise is justified by the fact that a crisis is a complex phenomenon and in many cases is the result of a combination of events. Currency and banking crises (hereafter twin 1) are the most widely studied and refer to the simultaneous occurrence of banking and currency problems. Spain suffered three twin 1 crises between 1850 and 2000, namely in 1882, 1931 and 1976. The BEKM (2001) research for Spain only considers the 1931 twin crisis.

According to the standard definition, the frequency of a crisis is the number of crises divided by the number of year observations, by period. The exercise has been carried out for four periods (1850-1913, 1914-1936, 1940-71 and 1973-2000) and the results are summarised in Figure 5. Our findings show that the most unstable period was 1914-1936, as a consequence of the high probability of suffering a banking crisis (13.6%) or a twin 1 crisis (4.5%). In contrast, the most stable period was 1940-1971, when banking crises were non-existent, while currency crises were more frequent (6.5%) than in the previous periods (1850-1913 and 1914-1936). Finally, the post-1972 years reveal an increase in the frequency of currency and twin 1 crises (11.1% and 3.7% respectively). In general, banking crises were more frequent in the first two periods (1850-1913 and 1914-1936) and currency crises in the second two periods (1940-71 and 1973-2000).

The results for Spain are similar to those obtained in BEKM (2001) for a broad sample of countries. As Table 4 shows, the period greatest instability coincided with the interwar period. However, with the exception of the 1940-1973 period, the frequency of crises is higher in Spain in the rest of sub periods than in the BEKM sample. Considering the different types of crises, exceptional banking instability is observed during the interwar period, which is even greater in the Spanish case than in the BEKM sample. Banking crises are also more frequent than in the BEKM sample during the

periods 1850-1913 and 1919-1936. However, low instability is observed from 1945 to 1971 as a consequence of banking crises being non-existent, despite the relatively high frequency of currency crises (around 6.5%). These results are very similar to those obtained by BEKM (2001). One explanation given for the absence of banking crises is that regulations in the Bretton Woods era were so restrictive and capital flows were so low that there were no causes for banking crises. The situation in Spain was similar. The civil war broke out at a time of financial self-regulation and the Franco regime prompted the imposition of structural controls and a shift in bank supervision away from market discipline and towards government discretion. As Pons (2002) argued, the strong regulatory framework in the Franco era reduced the instability of the banking system by sacrificing competition. Banks and saving banks in difficulties were systematically rescued by the Bank of Spain and financially sound banks with the fiscal support and under the auspices of supervisory authorities merged with and acquired banks in trouble. This was the other alternative used to avoid bankruptcies.

Does the frequency of crises depend on the globalisation of capital? Are crises more frequent without capital controls or do they depend on the nature of monetary and financial regimes? Has Spain suffered more crises with a fixed or a floating exchange rate? These questions warrant attention because of their significant policy implications, as BEKM suggested.

In terms of capital controls and monetary and financial regimes, the 1850-1913 period was characterised by a floating exchange rate regime, as Spain never adopted the gold standard due to the absence of capital control and the lack of regulation of the financial system. The main features of the interwar years (1914-1936) were a (dirty) floating rate regime, capital controls and a lightly regulated banking system. The prevailing elements of the Spanish regime from 1940 to 1971, as was the case elsewhere, were a fixed exchange rate with capital controls and a strictly regulated financial system. The last period, on the contrary, exhibited completely opposite characteristics, namely a flexible exchange rate, no capital controls and a deregulated financial system.

As regards the globalisation of capital, BEKM (2001) pointed out that the frequency of crisis in the two periods of globalisation (1850-1913 and 1973-2000) was different and that, consequently, globalisation did not seem to be a determinant of how frequently a crisis is suffered. Different crisis frequencies are also obtained for the two periods in the case of Spain, crises being more frequent in the 1973-2000 period.

Moreover, according to BEKM (2001), the reason for the relatively high frequency of currency crises in the periods 1940-1971 and 1973-2000 does not appear to be the globalisation of capital, because 1940-1971 was not a period of globalisation. However, they suggest it could be linked to the process of democratisation, which could have made maintaining currency policy discipline more difficult. However, this argument cannot be maintained in the Spanish case, as during the Franco dictatorship the frequency of currency crises was also very high. In this case, balance of payments problems could have been the result of the inherent disequilibrium of an emerging country in years of intense growth.

The exchange rate regime has not had a great influence on the frequency of crises either. The sixty-five years of nearly clean floating, from 1850 to 1913, and unrestricted capital mobility coincided with a period in which the frequency of (all) crises was lower. However, when Spain changed from a clean rate to the dirty floating rate that characterised the interwar years, banking or twin 1 crises became more frequent. Furthermore, an increase in crisis frequency is observed in the last two periods, when the exchange rate in Spain went from fixed to flexible. Hence, there are two periods with a floating exchange rate (1850-1914 and 1970-2000) which recorded very different results in terms of crisis frequency.

Finally, it is worth commenting in relation to financial regulation that banking crises were more frequent in the less regulated periods (1850-1913 and 1914-1936) than the most regulated years (1940-1971).

The final point in this section touches on another BEKM preoccupation: are emerging economies more crisis-prone? Does the frequency rate decrease when a country graduates as an industrial nation? BEKM results, when a large sample of 56 developed and less developed countries are examined, suggest that crises have been predominantly concentrated in emerging markets. In other words, crises are more frequent in emerging countries than in industrialised nations.

Over the 150-year sample period used in this research, Spain progressed from being underdeveloped before 1914 to an emerging nation between 1914 and 1971, becoming an industrialised country thereafter. So, have crises become more frequent? Has the crisis problem become more prevalent? It is difficult to find a straightforward answer to these questions. The most that can be said is that during the transition from an emerging to an industrial nation, the crisis frequency rate in Spain rose from 6.5% increase over the 1945-1972 period to 14.8% in the 1973-2000 period (see Table 4). Not

only was the frequency of crises different before and after 1973, but the frequency of currency and twin crises was also notably different. In particular, the frequency of currency and twin 1 crises is clearly higher in the post-1972 period than before. In this case, Spain did not follow the pattern of other emerging countries during the second half of the 20th Century.

Duration and depth of currency, banking and twin crises

Recovery time is defined as the number of years until GDP growth returns to its pre-crisis trend. By definition, minimum recovery time is one year. The depth or severity of a crisis is the cumulative loss of output estimated by summing the differences between trend growth and output growth after the crisis until the time when annual output growth has returned to its trend.

Quantifying the length and depth of a crisis is not a simple task, as it requires calculating the growth trend of the economy and defining the pre-crisis period of comparison (three, five or more years of normal growth) with the actual growth during the crisis. The IMF uses the GDP growth rate for the three years preceding the event, while BEKM computes the GDP growth rate over the five years preceding the event. As considering three or five years to determine the pre-crisis trend is an ad-hoc solution and, moreover, the years prior to a financial crises are in most cases characterised by an expansion or extra-growth, this paper takes a different approach. The growth trend in this case derives directly from the different phases of growth defined by Prados (2003). In his paper entitled “El progreso económico de España” (Spain’s Economic Progress in English), he estimated average growth rates for periods delimited by two peak years. This alternative was chosen because the three or five-year average growth rate for Spain was not sufficiently representative of the long term growth rate. In this case, potential growth is better captured by the growth rate of a full cycle, as defined by Prados (2003).

BEKM sustain that the recovery time from crises appears to be similar in the four periods under examination. However, crises seemed to be more severe between 1880 and 1913 than after 1973. Moreover, the output loss from currency crises in recent times is only two-thirds of that before 1913, while for banking crises, the figure was between 75% and 80%. Also according to BEKM, twin crises have become more severe since 1973, although output losses are not on the same scale as in the interwar years, particularly for emerging markets. In all periods, output losses were greater in emerging markets than in industrial countries. The average decrease in output following a crisis in

a sample of ten emerging markets is greater in the post-Bretton Woods era than the average fall in output following a crisis in any other period in the twentieth century.

Our results for the specific case of Spain are shown in Table 5. For "all crises" it appears obvious that the worst performance has been recorded in the latest period. The pre-crisis growth rate has taken longer (double the time) to recover than in any of the other three periods. In fact, recovery took as long as 4.5 years, compared to an average of 2 years for the other three periods. Moreover, post-1973 crises have not only lasted longer, but also been more severe, with a cumulative GDP loss as high as 14.54%, twice that of 1850-13 and three times the output losses in the interwar and Bretton Woods years. This result is in sharp contrast to the well-known conclusions reached by BEKM, for whom crises had grown more frequent but not more severe after 1973 (Table 7). The difference can be explained by the extraordinary severity of the twin crisis that occurred in the late 1970s. This was partly due to the impact of the deep industrial recession that took place during the transition from a dictatorship to democracy, and also to the slow adaptation of the Spanish economy to the more open and integrated economy of the former European Community¹³.

Another salient feature of Tables 5 and 7 is the relatively mild severity of the interwar crises in absolute terms and when compared with international experience. Duration was shorter and output losses (all crises) lower than in any of the other three periods. Industrial backwardness, financial isolation and the sharp depreciation of the exchange rate of the peseta against all major international currencies may explain this marked difference. There were three (not very severe) banking crises between 1913 and 1936 and a twin crisis in 1931 (with greater repercussions). If the three banking crises are omitted and only the 1931 twin crisis is considered, the results are more similar to those obtained by BEKM.

More detailed information is presented in Table 6, which lists the duration and depth of crises by year and type. The longest and deepest was the twin 1 crash in 1976-77. Complete recovery required a full decade and cumulative output loss peaked at 49.6%. The other two major disturbances date back to the nineteenth century, namely the banking crisis in 1866 and the twin 1 crisis in 1882. Both caused a cumulative GDP loss of around 14 %. Moreover, recovery from the latter took as long as six full years.

¹³The high output losses are also due to the abnormal and extraordinary growth rates achieved by the Spanish economy in previous periods.

5. Stock Market crises

Definition

In line with Barro and Ursúa (2009), this paper considers there is a stock market crisis when cumulative, multi-year returns are -0.250 or less of the stock price index. The peak-to-trough method is applied to obtain the size of the declines¹⁴. This method obtains the peak-to-trough period and, in order to establish a stock market crash year, we assign the year when the cumulative decline in stock market prices records returns of -0.25 . See data appendix for definitions and sources.

Main results

Following the stock market crisis definition, a total of 12 stock crisis in Madrid, 6 in Barcelona and 4 in Bilbao were identified between 1850 and 2000¹⁵. The peak and trough of these crises and the declines in returns are presented in Tables 8 and 9. As can be observed in Table 9, there have been 14 stock market crises¹⁶, 12 of which coincided with the Madrid stock market, occurring in overlapping or adjacent years, and only 2 in Barcelona. In the case of the Bilbao crisis (1900-1902), the crisis from 1900 to 1904 is considered, coinciding with the Madrid crisis during this period (1902-1906). In comparison to the case documented by Barro and Ursúa (2009), Spain suffered more crises than the USA, even if only the Madrid homogenous market is considered during the entirety of the sample period (1850-2000). There were 7 stock market crises in the USA between 1869 and 2008 (1907-07, 1916-20, 1929-31, 1937-37, 1939-41, 1973-74, 2000-02, 2008-08). If the same period and one market (the Madrid homogeneous market) are also taken into account in the two countries (1869-2000), the number of crises would be 12 in Spain (in the Madrid stock market) and 6 in the USA.

Stock Market crises and depressions

The stock market crises will now be matched to the economic depressions as in Barro and Ursúa (2009). Contractions are calculated by computing peak-to-trough

¹⁴ A Hodrick-Prescott filter has also been applied to attempt to gauge long-run, as opposed to transitory crises, but this reduced the number of stock market crises considerably, even in the case of those normally considered in the literature. As a result, it was not used in this paper.

¹⁵ A descriptive analysis of the stock market crises in Spain can be found in Cuevas (2011).

¹⁶ Although we have considered a stock market crisis for the years 1935-1940, it must be said that the stock exchange was closed during this period.

fractionals that exceed a certain threshold. We consider the limit to be 0.10 as in Barro and Ursúa (2008, 2009). There have been 4 macroeconomic contractions or depressions in Spain: 1866-1868, 1894-1896 (the period can be considered as 1892-96, as in Barro and Ursúa (2008, 2009) for Spain), 1929-33 and 1935-1939, the latter coinciding with the Civil War (1936-39), although the period 1877-79 was closer to a macro contraction¹⁷. There were only two contractions in the USA over the period from 1869 to 2006, in 1917-21 (due to the effect of influenza) and 1929-33 (Barro and Ursúa 2008, 2009).

Table 10 presents the matches between stock market crises and depressions and Table 11 shows them in three panels: 1) stock market crises with depressions, 2) depressions without stock market crises and 3) stock market crises without depressions. Three stock market crises with depressions have been identified, 1 depression without a stock market crisis and 10 stock market crises without depressions, although the 1871-74 stock market crisis was close to a depression.

In the case of the USA, unlike many other countries, there were no depressions that were not associated with a stock market crisis. But this was not the case in Spain, where the 1892-96 did not include a stock market crisis. Also, the period 1877-79 was close to a macro contraction.

In the study carried out by Barro and Ursúa (2009) considering 25 countries (18 OECD), matching periods of stock market crises with those of macroeconomic declines exist in 58 cases (stock market crashes that paired up with depressions), 26 cases of depressions that were not associated with stock-market crises and 137 cases of stock market crises not associated with depressions. That means an average per country of 2.32 stock market crises with depressions, 1.4 depressions without a stock market crisis and 5.48 stock market crises without depressions. Spain is above the average in the case of stock market crises with depressions (3) and especially in stock market crises without depressions (10), but below the average in the case of depressions without stock market crises (1). This result could imply that the stock market was not an important means of financing investment in Spain and even that the stock market was less developed, for which reason the economic repercussions of a stock market crisis were less serious than in other countries.

¹⁷ Spain suffered an economic crisis between 1975 and 1985, but not a macro contraction. Growth rates were not negative during this period, but were very low in relation to previous years. However, the consequences of this economic crisis in terms of unemployment were very severe.

Table 12 presents the calculations of the frequency of stock market crashes and depressions in Spain and this is compared to the case of the USA and the sample of 25 countries and the sample of just 18 OECD countries measured in the Barro and Ursúa (2009) study. In Spain, if one knows a stock market crash (return of -0.250 or more or worse) occurred it is 21.43% probable (three out of every 14 stock market crashes) that a depression (of size 0.10 or more) also occurred. Furthermore, if one knows a depression (of size 0.10 or more) occurred, it is 75% probable (3 out of every 4 depressions) that a stock market crash (of size -2.50 or worse) also occurred. In all the countries in the Barro and Ursúa (2009) sample, if one knows a stock market crash (return of -0.250 or more or worse) occurred, it was 29.79% probable that a depression (of size 0.10 or more) also occurred. In the case of the sample of 18 OECD countries, the probability was 27.7% and in the case of USA it was 28.6%. However, if one knows a depression (of size 0.10 or more) occurred, it is 69% probable that a stock market crash (of size -0.250 or worse) also occurred, the same probability as in the case of the 18 OECD countries and 100%, as commented previously, in the USA. Therefore, the probability of a stock market crash in Spain, conditional to observing a depression, was below the average for the sample of 25 countries, the sample of 18 OECD countries and the USA. However, the probability of suffering a depression, conditional to a stock market crash was greater in comparison to the samples of 25 countries and 18 OECD countries, but smaller than in the USA, where the pairing percentage was 100%.

Given that the Barro and Ursúa (2009) study obtained a higher probability that in wartime a stock market crash would become a depression, non-war periods and war periods have been separated in Table 12. However, our results show that the probability of a stock market crash, if a depression occurs, is the same in both war and non-war periods. In that sense, the probability of a depression in the case of a stock market crash in a non-war period in the sample of 25 countries is 20% compared to 30% when all the periods are considered, while in the sample of 18 OECD countries the figure drops from 28% to 17%. In the case of Spain, the probability is also lower, at 14.28% rather than 21.43%. However, in the war time period, the probability of a depression conditional to observing a stock market crash is 70% for all 25 countries, compared to 30% previously, while it is 100% in the Spanish case.

In short, Spain suffered more stock market crises than the USA, than the sample of 25 countries and the sample of 18 OECD countries and therefore the more developed countries studied in Barro and Ursúa (2009), but the crises had less of an economic

impact than in the countries considered in the comparison. One possible reason for this could be that the stock market in Spain was not as important and less developed.

6. Debt crises

Definition

A debt crisis is considered to be a period where the public debt to GDP ratio rises above 100%. In order to identify debt crises, the following indicators are used: a) the public debt to GDP ratio, b) international and domestic defaults. Sources can be found in the data appendix.

Main results

The ratio of domestic public debt to GDP shows two periods of debt crises: 1874-1891 and 1899-1909. The results are similar when the total public debt to GDP ratio is considered, which includes domestic and international debt. In this case, the debt crises were identified in 1850, 1868-1882 and 1896-1909. Reinhart and Rogoff (2008) consider the following external defaults in Spain: 1851, 1837-1867, 1877-1892 and, finally, the intervention of the IMF in 1959, 1960 and 1978 and the domestic default in 1936-39. The main results are summarised in Table 13.

Reinhart and Rogoff (2010, p. 10) take into account periods of international sovereign debt crises, using the share of countries in default or restructuring as an indicator: 1) The Napoleonic War, 2) from the 1820s through 1840s, 3) the early 1870s lasting for two decades, 4) from the Great Depression to the 1950s, 5) the most recent emerging market debt crisis of the 1980s and 1990s. Therefore, Spain belongs to the third period of international sovereign debt crises.

7. The frequency of all types of crises

As indicated above, the frequency of a crisis is defined as the number of crises divided by the number of year observations, by period. In this section we obtain the frequency of all types of crises. In addition to the crises described previously (currency, banking, twin 1 and stock market), another three have been computed that combine elements of individual crises. The following definitions are added to the twin 1 crises: twin 2, which is defined as the combination of a banking and stock market crisis, and

twin 3, which is the combination of currency and stock market crises. These two types of crises have received less attention in the literature. However, we have found that in the case of Spain, they add pieces of information that are useful to understand the length and severity of certain historical episodes. To close the circle, we decided it was worth offering what we call a "triple crisis", an unfortunate event that involves the simultaneous occurrence of a currency, banking and stock market shock.

As in section 4, the exercise has been conducted for all four periods and the results are summarised in Figures 6 and 7. The interwar period records the highest frequency of (all) crises (18.2%). The second period with the highest frequency of crises was 1973-2000 (14.8%). When comparing crisis frequency over the last two periods, 1940-71 (9.7%) and 1973-2000 (14.8%), an increase in instability was observed.

The main contrast between Figure 5, which only considers currency, banking and twin 1 crises, and Figure 6, where stock market crises and their combinations are considered, is the relatively high frequency of all crises in the periods 1850-1913 and 1940-1971 when stock market crises are included. This is due, as commented in the previous section, to the fact that there were more stock market crises in Spain than in the other countries considered in the Barro and Úrsua (2009) study. Furthermore, stock market crises were more frequent in the first two periods (1850-1913 and 1914-1940) than in the last two periods (1941-1971 and 1973-2000).

As regards the different types of crises, in the period 1850-1913, stock market crises were the most common (4.8%), followed by twin 2 (banking and stock market) crises (3.2%). Between 1914 and 1936, the most frequent crises were banking, twin 2 and triple crises (4.5%, 9.1% and 4.5%, respectively). During the Franco regime (1945-1971), the most frequent crises were currency, stock market and a combination of the two or twin 3 crises. In this period there were no banking crises (with a frequency of 3.2%). In the last period (1973-2000), the most frequent were currency crises (7.4%), followed by twin 3 and triple crises (both with a frequency of 3.7%).

In reference to combined crises, Figure 7 illustrates that the combination of banking and stock market crises (twin 2) only occurred in the first two periods (1850-1913 and 1913-1936). On the contrary, currency and stock market crises (twin 3) only took place in the post 1940 period. However, with the exception of the period 1940-1971, triple crises occurred in the rest of the sub-periods considered.

As far as duration and depth are concerned, the main results when considering all types of crises are shown in Tables 14 and 15. The period 1973-2000 was, as in

Section 4 (when only currency, banking and twin 1 crises were considered) the worst. Once again, the pre-crisis growth trend took double the time to recover than in any of the other three periods. Post-1973 crises were also more severe, with a cumulative GDP loss as high as 14.54 per cent. The main difference in regard to the results obtained in Section 4 is that in this case the depth of the crises in the period 1850-1913 was not entirely dissimilar to those in the 1973-2000 period, with a cumulative GDP loss of 11.15%. In any case, considering all types of crises generally confirms the results obtained in this section and contrasts with the well-known BEKM conclusion that crises had become more frequent but not more severe since 1973. As Table 14 indicates, in the post-1973 period Spain experienced more severe crises and, as indicated in Section 4, the reason for this difference is the extraordinary severity of the triple crisis that occurred in the late 1970s.

The ranking (in brackets) of crises in terms of the largest output loss is as follows: 1866 (3), 1882 (4), 1892 (2), 1931 (5) and 1976 (1), triple crises being recorded in 1882, 1931 and 1976. These crises also coincide with some of the main macroeconomic contractions (1866, 1892, near to a macro contraction, 1931) analysed in Section 5.

8. Conclusions

The objective of this paper is three-fold. Firstly, to identify all the major financial, currency, banking, stock market and debt crises that have occurred in Spain in the last 150 years, estimate their frequency by period and measure their length and depth. Secondly, to compare our findings for a single country with the well-known results for currency and banking crises obtained by BEKM for a sample of 21 and 56 countries and the stock market crises and depressions for a sample of 25 countries and another including 18 OECD countries by Barro and Úrsua (2009). Finally, to perform an analysis of the main financial crises in order to establish hypotheses that could be tested in future research.

Although we believe this is the first time this exercise has been conducted for Spain or any other individual country, we claim little methodological innovation in our approach. However, progress in the study of history is made by taking small steps and by adding details to great theories or interpretations. This paper presents quantitative analyses for a large number and types of financial crises and compares the crises prior

to 1913 and in the interwar and post-World War II periods. Although this study is confined to Spain, this case may serve to test the results for one country against those obtained by other studies for a much larger sample in which many details are obviously underscored.

What can be learnt from this exercise? What conclusions have we reached? Do they confirm or reject our previous knowledge? Does our story differ from the story told by BEKM and Barro and Úrsua? In what follows we briefly summarise our findings.

A total of 18 crises of various classes and combinations over the last 150 years have been identified, which occurred under different monetary and regulatory regimes. All crises seem to have been more frequent in Spain than in the BEKM sample. This result is obtained even without considering stock market crashes and other combinations. Although Spain records higher crisis frequency in most of the periods, the main differences are observed in the first two sub-periods: 1850-1913 and 1914-1936. Crisis frequency does not change significantly when stock market crises are included, with the exception of 1850-1913 (from 6.3% to 11.1%) and 1940-1971, albeit recording a much smaller change (from 6.5% to 9.7%). Consequently, these two periods are now more unstable.

Crises have been followed by recessions lasting on average 2-4 years, a duration not dissimilar to the 2-3 years recorded by BEKM. All crises worldwide (BEKM) recorded an average cumulative output loss of 9.2%, while in the case of Spain the figure was 8.9%. Table 14 reveals that this relatively small difference is due to the interwar depression, which was milder in Spain. On the contrary, the losses recorded in the last period were greater in Spain than at international level.

Banking crises, either on their own or in combination with currency and stock market crises, were more prevalent during the interwar period than in any other. In contrast, currency crises took place more often during the period 1945-72, when Spain was in the process of graduating as an industrial nation. The rapid transformation of the economy during the 1950s and 1960s with high import requirements of raw materials and intermediate goods caused repetitive balance of payments disequilibriums, exerting strong pressure on the exchange rate. In general, banking and stock market crises and their combinations were more frequent in the first two periods (1850-1913 and 1914-1936), while currency crises and its combinations were more common in the second two periods (1940-1971 and 1973-2000).

Our results reveal that stock market crises were more frequent than in the Barro and Ursúa (2009) sample. However, Spanish stock market crashes had less of an economic impact than in the countries in the Barro and Úrsua sample.

According to BEKM, crises have become more frequent but not more severe, a hypothesis that can be said to epitomise the main argument of their study. Do we have robust enough evidence to sustain the same for Spain? As indicated above, what our evidence reveals is that the rate of frequency of Spanish crises was high after 1913 and has remained high since, in keeping with BEKM. However, the crises in Spain in the last period (1973-2000) were more severe than in previous years, although this result is due to the intensity of the financial crisis in 1977-82. Therefore, crises have become more frequent and also more severe in Spain.

As mentioned above, the analysis in this paper aims to establish some hypotheses to be tested by future research. Firstly, are financial crises the price to pay for previous periods of extra-growth, as was the case with Spain in the 1860s, the 1920s and the 1970s? Is there a relationship between the severity of a crisis and a stronger or weaker expansion in the years prior to the crisis? Why did Spanish financial crises have a lower impact during the interwar years and a higher impact in the 1970s? Secondly, in Spain periods of strong regulation and greater financial stability appear to be correlated, but perhaps with the trade-off of less efficiency in the financial sector. What is the impact of regulation on financial crises? Thirdly, is the Spanish financial crisis chronology different to the international pattern? What was the impact of international crises in Spain? Are international factors or autochthonous factors the main determinants of Spanish financial crises? Which had a greater impact on Spanish financial crises? Fourthly, why were stock market crashes more serious in the periods 1850-1913 and 1914-1936? In Spain (as in other countries), the main macro-contractions were found to coincide with a stock market crash. So, do financial crises and depressions share the same determinants? Are depressions accompanied by more severe financial crises?

REFERENCES

- Accominotti, O. Flandreau, M. and Rezzik's, R. (2010): "The Spread of Empire: Clio and the Measurement of Colonial Borrowing Costs", forthcoming, The Economic History Review.
- Barro J. R. and Ursúa, J. F. (2008): "Macroeconomic Crisis since 1870", National Bureau of Economic Research, WP, 13940.

- Barro J. R. and Ursúa, J. F. (2009): "Stock Market crashes and Depressions", National Bureau of Economic Research, WP, 14760.
- Bordo, M. (1986), "Financial crises, banking crises, stock market crashes and the money supply: some international evidence, 1870-1933", in F. Capie and G.E. Wood (eds), Financial crises and the world banking system. London, Macmillan.
- Bordo, M., Eichengreen, B., Klingebiel, D. and Martinez-Peria, M.S. (2001): "Financial crisis. Lessons from the last 120 years. Is the crisis problem growing more severe?", Economic Policy, April, pp. 53-82.
- Carreras, A. and Tafunell, X. (2003), Historia económica de la España contemporánea. Barcelona, Crítica.
- Carter, S.B., Gartner, S.S., Haines, M.R., Olmstead, A.L., Sutch, R. and Wright, G. (2006): Historical Statistics of the US. New York. Cambridge University Press.
- Castañeda L. and Tafunell, X. (2001): "La Bolsa de Barcelona entre 1840 y 1913: un nuevo índice", in C. Sudriá, and D. Tirado, eds: Peseta y protección. Comercio exterior, moneda y crecimiento económico en la España de la Restauración. Barcelona. Universidad de Barcelona, pp. 208-236.
- Cuevas, J. (2011): "Las crisis bursátiles en la historia de España. Una visión de largo plazo". X Congreso Internacional de la AEHE, Sevilla, unpublished paper.
- Chancellor, E. (1999), Devil takes the hindmost: a history of financial speculation. London, Macmillan.
- Dermirguc-Kunt, A. and Detragiache, E. (1998): "The Determinants of banking crises in developing and developed countries". IMF Staff Papers, v.45, n° 1, March.
- Eichengreen, B. and Bordo, M. (2003), "Crises now and then: what lesson from the last era of financial globalization", in P. Mitzen (ed), Monetary history, exchange rates and financial markets. Essays in honour of Charles Goodhart. Edward Elgar.
- Eichengreen, B., Rose, A. and Wyplosz, C. (1996), "Contagious currency crises: first tests", Scandinavian Journal of Economics, 98, 4.
- Eichengreen, B., Rose A. and Wyplosz, C. (1997): "Contagious currency crises". National Bureau of Economic Research, WP 5681.
- Estadísticas Históricas de España, Madrid, Fundación BBVA
- Federal Reserve Bank of St. Louis, <http://www.stlouisfed.org/>
- Fernández, V.J. (2000): "Política de tipo de cambio de la peseta y el euro", in L. Gamir, coord: Política Económica de España (7ª ed), pp. 179-197.
- Frankel, J.A. and Rose, A.K. (1996): "Currency crashes in emerging markets: an empirical treatment". Journal of International Economics, v.41. issues 3-4, pp. 351-366.
- Goodhart, Ch. and Delargy, P.J.R (1998), "Financial crises: plus ça change, plus c'est la même chose", International Finance, 1, 2, pp. 261-287.
- Gordon, R. J. (1986): The American Business Cycle. Continuity and Change. Chicago and London. The University of Chicago Press.
- Homer, S. and Sylla, R. (2005): A History of Interest rates. New Brunswick and New Jersey. Rutgers University Press.
- Hortalá, J. (2006): Crisis y auges en la Bolsa de Barcelona: 1830-2006. Cuadernos de Economía, v. 29, pp.5-68.
- Houpt, S. and Rojo-Cagival, J.C. (2010): "Capital market integration in Spain? Introducing the Bilbao Stock Exchange, 1891-1936". Revista de Historia Económica. Journal of Iberian and Latin American Economic History, v. 28, issue 3, pp. 535- 573.

- Hoyo, A. (2007): Economía y Mercado de valores en la España contemporánea. La evolución de la bolsa antes del big bang español, 1831-1988. Santander. Universidad de Cantabria.
- International Monetary Fund (1998): "Financial crises: characteristics and indicators of vulnerability", World Economic Outlook (May), IMF, Washington, DC.
- Kaminsky, G.L. and Reinhart, C. (1999): "The twin crises: The causes of banking and Balance of Payment Problems". The American Economic Review. June, pp. 473-500.
- Kindleberger, Ch. P. (2000, 4th edn), Manias, panics and crashes: a history of financial crises. Chichester, John Wiley.
- Li, J., Rajan, R.S. and Willet, T. (2006): "Measuring currency crises using Exchange Market Pressure indexes: the imprecision of precision weights". Unpublished paper.
- Martin-Aceña, P. (1985): La cantidad de dinero en España, 1900-1935. Madrid. Banco de España. Servicio de Estudios.
- Martín-Aceña, P., Betrán, C. and Pons, M.A. (2009a): "Financial crises and financial reforms in Spain: what have we learned?". Working Paper 10-01. Universidad Carlos III de Madrid.
- Martín-Aceña, P., Pons, M.A. and Betrán, C. (2009b): "Financial Crisis and Financial reforms in Spain. What Have We Learned?". Banca d'Italia.
- Minsky, H.P. (1977), "A theory of systemic fragility", in E.I. Altman and A.W. Sametz (eds), Financial crises: institutions and markets in a fragile economic environment. Wiley.
- Mitchell, B. R. (1998): British Historical Statistics. Cambridge. Cambridge University Press.
- Mitchell, B.R. (1994): International Historical Statistics. Cambridge. Cambridge University Press.
- Navas, M. y Sudriá, C (2007): "La crisi financera de 1866 a Catalunya: una revisió". Reçerques, 55, pp. 35-52.
- Palafox, J. (1991): Atraso económico y democracia. La Segunda república y la economía española, 1892-1936. Barcelona. Ed. Critica.
- Pons, M.A. (2002): Regulating Spanish Banking, 1939-1975. Aldershoot. Ashagate.
- Prados de la Escosura, L. (2003): El progreso económico de España, Madrid, Fundación BBVA.
- Prados de la Escosura, L. (2009): "Spain's International Position, 1850-1913". Working Paper 09-09. Universidad Carlos III de Madrid.
- Pueyo, J. (2003): Las condiciones de la competencia en la banca española, 1921-1974. Tesis Doctoral. Universidad de Barcelona.
- Reinhart, C. and Rogoff, K.S. (2008a): "Banking crisis: an equal opportunity menace". National Bureau of Economic research, WP 14587.
- Reinhart, C. and Rogoff, K.S. (2008b): "This time is different? A panoramic view of eight centuries of financial crisis", National Bureau of Economic Research, March 2008, WP, 13882.
- Reinhart, C. and Rogoff, K.S. (2008c): "Is the 2007 US sub-prime financial crises so different? An international historical comparison?". National Bureau of Economic Research, WP 13761.
- Reinhart, C. and Rogoff, K.S. (2010): "From Financial Crisis to Debt Crisis", National Bureau of Economic Research, WP 15795.
- Sardá, J. (1948): La política monetaria y las fluctuaciones de la economía española en el siglo XIX. situación monetaria a principios del siglo XIX. Madrid. CSIC.

- Serrano Sanz, J.M. and Asensio Castillo, M.J. (1997): “El ingenierismo cambiario: la peseta en los tiempos del cambio múltiple, 1948-1959”. Revista de Historia Económica, nº 3, otoño-invierno, pp. 545- 573.
- Serrano Sanz, J.M.: “La internacionalización financiera española: de la peseta al euro”, Banco de España (2006): 150 años de Historia del Banco de España. Madrid. Banco de España.
- Sheppard, D.K (2006): The growth and role of the UK Financial Institutions. Abingdon. Routledge.
- Tedde de Lorca, P. (1974), “La banca privada española durante la Restauración, 1874-1914”, Tortella, G. (dir), La banca española en la Restauración. Banco de España.
- Tortella, G. (1973): Los orígenes del capitalismo en España. Madrid. Tecnos.

DATA APPENDIX

Currency crises

As regards the data, there are two options when it comes to analysing the evolution of the exchange rate. On the one hand, Carreras and Tafunell (2003) constructed an exchange rate series. From 1850 to 1913 they only consider the peseta/£ exchange rate, from 1914 to 1936 the exchange rate of the peseta with respect to a basket of currencies (the pound, the dollar and the French franc) and for the rest of the period they combined different exchange rate data (the peseta/\$ exchange rate and from 1962, a basket of currencies in which each is weighted by its importance to Spanish foreign trade). On the other hand, we have the £/pts rate of exchange from 1850 to 1913 and the \$/pts rate of exchange from Spanish Historical Statistics (EHE).

More sophisticated data are required to construct the EMP ratio. In reference to the anchor currencies, the £/pts rate was considered from 1850 to 1913 and the \$/pts from 1914 to 2000. Data on short term interest rates for Spain are from EHE and for the UK (1850-1913) and the USA (1914-1989) from Homer and Sylla (2005). USA interest rate data for the last years (1989-2000) are from the Federal Reserve Statistic Release. The ratio variation in Reserves/M1 is more problematic. In Spain, there is no homogenous series on the variation of reserves from 1850 to 2000. For this reason different sources have been used to compile the series. Prados' (2009) estimate was used for the period 1850 to 1913. This author obtains the variation in reserves from a balance of payments estimate. Similar data are not available from 1914 to 1930, so the Martin Aceña (1985) series on gold reserves was used to obtain reserve variations. However, in the years for which we have data for both variables (reserve variations from Prados (2009) and gold reserves from Martin Aceña (1985)), significant

differences are observed between them. Taking this discontinuity into account, this estimate was included in the reserve variation series. EHE provides the data for the period from 1931 to 2000, which come from the balance of payments estimate as per Prados (2009). For the UK, there is no continuous series either, for which reason reserve variations were obtained from data on total reserves from Accominotti, Flandreau and Rezzik's (2010) for the period 1881-1911. Balance of payments data from Mitchell (1994) are used for the rest of the years (1912-1994). Finally, for the USA, data from the balance of payments provided by US Historical Statistics (1874-1998) were used.

Similar problems were encountered with the M1. For Spain, there are data on money supply from the EHE. For the UK, the data on M1 are only for the period 1922-2000 (Mitchell 1994). For the period 1880-1952, data on money supply from Sheppard (2006) was used and from 1952 to 2000 from Mitchell (1998). For the US, data on the M1 are only from 1915 (Gordon 1986), so the M2 from Gordon (1986) for the period 1869-1982 and US Historical Statistics (1982-1992) were used as a proxy. For the most recent years (1993-2000), data were compiled by the Federal Reserve Bank of St. Louis.

Banking crises

Data on nominal bank stock prices came from Hoyo (2007) and were then deflated by a CPI from EHE. As regards the number of banks, several sources were used: Tortella (1973) for the period 1850-1875, Tedde (1974) for the period 1875-1935, EHE (2005) for the period 1939-1975 and Pueyo (2003) for the period 1942-1995. For bankruptcies and other qualitative data, such as the name and size of banks that closed, data from Martín Aceña, Betrán and Pons (2009) were used. The rest of the variables, real banking profitability, change in bank deposits, credits and loans/GDP and credit and loans/Deposits, all came from the EHE.

Stock market crises

A combination of stock prices in Madrid, Barcelona and Bilbao¹⁸ were used for the pre-1940 period. These three markets were considered for this period because most of the shares quoted in Madrid were bonds until World War I, whereas Barcelona and Bilbao were industrial centres representative of the consumer goods industry and heavy industry respectively¹⁹. For this reason, Table 9, in order to identify the main stock

¹⁸ The data sources for Madrid and Barcelona are the EHE (1850-1913) and Hortalá (2006) for 1913 to 1936 and Houpt and Rojo Cagigal (2010) for Bilbao.

¹⁹ According to Castañeda and Tafunell (2001), the main differences between Barcelona and Madrid are a consequence of the different kinds of firms listed on the indexes. The Barcelona index reflected the expectations and results of the large companies in the region, whereas Madrid reflected a mixture of

market crises in Madrid from 1850 to 1940, only considers private securities. However, as Madrid included all the major equity trading of the major companies from the 1940s onwards, the index is restricted to this market after 1940.

A nominal arithmetic index is available for Barcelona for the period 1850-1936, which was deflated by a consumer price index from the EHE. A nominal arithmetic index is also used for the Madrid stock market for the period 1850-1936 and a general total return index for the period 1940-2000, all of them deflated by the CPI²⁰. Finally, an unweighted general index from Houpt and Cagival 2010²¹ is used in the case of Bilbao for the period 1891-1936. This index was also deflated by the CPI.

Debt crises

The data for the public debt to GDP ratio are from EHE and the data for international defaults come from Reinhart and Rogoff (2010). These data have been combined with quantitative and qualitative information from Comín (1996).

Main sources

Currency crises:

Exchange rate:

- Carreras and Tafunell Index: 1850-1913 peseta/£ exchange rate, 1914-1936 exchange rate of the peseta with respect to a basket of currencies (the pound, the dollar and the French franc), 1936-2000 a combination of different exchange rate data (the peseta/\$ exchange rate and from 1962 a basket of currencies where each currency is weighted by its importance in the Spanish foreign trade). Carreras, A. and Tafunell, X. (2003): *Historia Económica de España*. Barcelona. Crítica.
- 1850-1913 £/pts exchange rate and 1913-2000 \$/pts exchange rate, EHE (2005).

EMP index:

- Interest rate: Spain, EHE (2005), the UK (1850-1913) and the USA (1914-1989), Homer, S. and Sylla, R. (2005): *A History of Interest rates*. New Brunswick and New Jersey. Rutgers University Press, USA (1989-2000), Federal Reserve Statistic Release. <http://www.federalreserve.gov/releases/h15/data.htm>

regional and national forces and the expectations of foreign investors about the Spanish economy. Houpt and Rojo Cagival (2010) examined the degree of Spanish capital market integration considering the three most important exchanges (Barcelona, Bilbao and Madrid), obtaining some evidence of market integration in the 1920s but finding that the markets examined were mainly driven by regional domestic forces for the rest of the period.

²⁰ Besides stock prices corrected by dividends and increases in capital, this index takes into account the reinvestment of dividends. The index expresses the expected returns of the stock market.

²¹ This index includes shares in banks, railways, electricity, mining, shipping and industry (see Houpt and Cagival 2010).

-Reserves: Spain, 1850-1913, Prados (2009), 1914-1930, Martin-Aceña, P. (1985): *La cantidad de dinero en España, 1900-1935*. Madrid. Banco de España. Servicio de Estudios, and 1931-2000, EHE (2005). The UK, 1991-1911, Accominotti, O., Flandreau, M. and Rezzik's, R. (2010): "The Spread of Empire: Clio and the Measurement of Colonial Borrowing Costs", forthcoming *The Economic History Review*, 1912-1994, Mitchell, B.R. (1994): *International Historical Statistics*. Cambridge. Cambridge University Press. The USA, 1874-1998, Carter, S.B., Gartner, S.S., Haines, M.R., Olmstead, A.L., Sutch, R. and Wright, G. (2006): *Historical Statistics of the US*. New York. Cambridge University Press.

-M1: Spain, EHE, the UK, 1880-1952, Sheppard, D.K. (2006): *The growth and role of the UK Financial Institutions*. Abingdon. Routledge, 1952-2000, Mitchell, B. R. (1998): *British Historical Statistics*. Cambridge. Cambridge University Press, the US, 1869-1982, Gordon, R. J. (1986): *The American Business Cycle. Continuity and Change*. Chicago and London. The University of Chicago Press, 1982-1992, Carter, S.B., Gartner, S.S., Haines, M.R., Olmstead, A.L., Sutch, R. and Wright, G. (2006): *Historical Statistics of the US*. New York. Cambridge University Press, 1993-2000, Federal Reserve Bank of St. Louis, <http://www.stlouisfed.org/>

Banking crises:

-Real bank stock prices: bank stock index Hoyo, A. (2007): *Economía y Mercado de valores en la España contemporánea. La evolución de la bolsa antes del big bang español, 1831-1988*. Santander. Universidad de Cantabria. Prices from EHE (2005).

-Number of banks: 1850-1875 Tortella, G. (1973): *Los orígenes del capitalismo en España*. Tecnos, 1875-1935 Tedde de Lorca, P. (1974), "La banca privada española durante la Restauración, 1874-1914", en Tortella, G. (dir), *La banca española en la Restauración*. Banco de España, 1939-1975, EHE (2005) and 1942-1995, Pueyo, J. (2003): *Las condiciones de la competencia en la banca española, 1921-1974*. Tesis Doctoral. Universidad de Barcelona.

-Bankruptcies, name and size of banks closed: Martín Aceña, P., Betran, C. and Pons, M.A. (2009): Financial crises and financial reforms in Spain: what have we learned? Working Paper 10-01. Universidad Carlos III de Madrid.

-Real banking profitability: EHE (2005)

-Changes in bank deposits: EHE (2005)

-Other complementary ratios such: Credits and Loans /GDP and Credit and Loans/Deposits. EHE (2005)

Stock Market crises

-Barcelona: nominal arithmetic index (*Indice Aritmético Nominal*) 1850-1936, EHE (2005) and prices EHE (2005).

-Madrid: nominal arithmetic index (*Indice Aritmético Nominal*) 1850-1936 and a general total return index (*Indice General Total*) 1940-2000, EHE (2005) and prices EHE (2005).

-Bilbao: Houpt, S. and Rojo-Cagival, J.C. (2010): “Capital market integration in Spain? Introducing the Bilbao Stock Exchange, 1891-1936”. *Revista de Historia Económica. Journal of Iberian and Latin American Economic History*, v. 28, issue 3, pp. 535- 573.
Prices EHE (2005)

Debt crises

EHE (2005)

Reinhart (2010): From Financial Crisis to Debt Crisis, *NBER*, WP 15795.

TABLE 1: Currency crises according to different indicators

Exchange rate Carreras and Tafunell (2003)	Exchange rate EHE	EMP index same weights for all the period (I)	EMP index same weights for all the period (II)	Unweighted EMP index (I)	Unweighted EMP index (II)	EMP index different weights by period (I)	EMP index different weights by periods (II)	Spanish literature	Bordo et al (2001)
1852									
1890							1883	1883	
1898	1898			1899	1899	1899	1899	1899	1890
1921	1921-22								
1930-1931	1931-32-33		<i>1930</i>	<i>1934</i>	<i>1934</i>		1930	1931	1931-1932
	1938								
	1942	1943	1943	1943	1943	1943	1943		
1949-1951	1946-47-48 1950-51						<i>1954</i>	<i>1954</i>	1948-51
<i>1957</i>	1958						<i>1958</i>	<i>1958</i>	1958
1959							<i>1962</i>	<i>1962</i>	1958
	<i>1968</i>								1967
		<i>1974- 1975</i>	<i>1974- 1975</i>	1974	1974	1974-75	1974-75	1967 1971	1967 1971
	1978							1977	1976
	1982-83-84	1985	1985	1980	1980			1982	1982
		1991	1991	1988	1988			1992	1992
	1994			1991	1991	1991	1991	1995	1995
	<i>1998</i>								

(I) Without 1914-1930 period and (II) With 1914-1930 period. In grey those crises in the limit of acceptance

TABLE 2: Banking crises according to different indicators

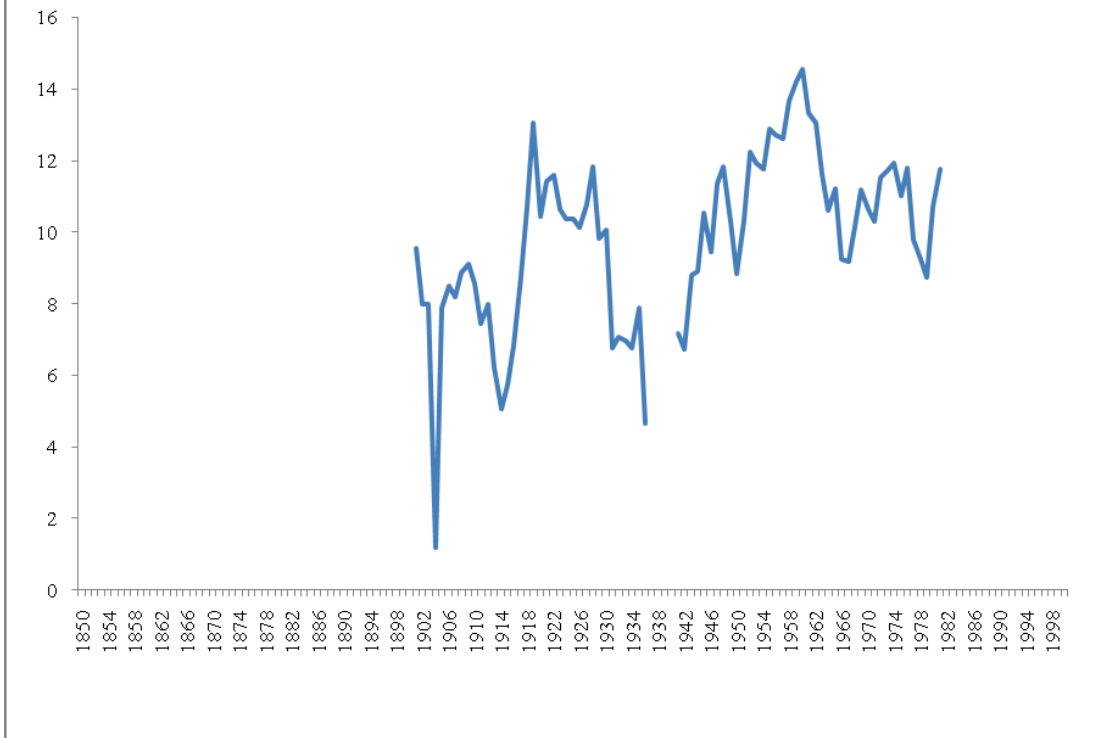
Literature	Real bank stock prices	Real banking profitability	Number of banks	Change in deposits	Credit and Loans/GDP
	1859-1860				1861
1866	1863-66 or 1863-1869		1866-1870	1864 and 1868	1857
	1871-1874		1874		1870-1872 y 1877
1881-82			1883-1887	1881-1882	1883
1890	1890-1892		1891-92 y 1897	1890-1894	1891 -1895
	1894- 1896			1899	
		1904		1902	
1913-1914	1910-1916	1913-1914	1908 and 1911	1914	1912-1915
1920		1920	1919		
1924-25			1924-1925	1924-1925	1925
1931	1928-1932	1931	1929 and 1934-1935	1931	1931
		1949	1943 and 1944		1944
		1966	1952-1959		
			1967-72		
1977-1983		1977	1977-1978		1978
				1992	

TABLE 3: Main banking crises

	Real bank stock prices	Change in real banking profitability	Number of Banks*	Change in deposits
1866	Peak: 1863 Trough: 1866 Stock returns: -0.50	n.a.	Suspension of payments: Compañía General de Crédito (Madrid), and Catalana General de Crédito and Crédito Mobiliario barcelonés (Barcelona)	1867-1868: -0.12
1881-1882	Peak: 1882 Trough: 1883 Stock returns: -0.18	n.a.	Number of banks: 1882-1887: -22 banks	1882-1883: -0.22
1890	Peak: 1890 Trough: 1892 Stock returns: -0.32	n.a.	Number of banks: 1890-1892: -2 banks	1889-1890: -0.29
1913-1914	Peak: 1910 Trough: 1916 Stock returns: -0.44	1913: -1.75 1914: -1.15	Trouble in the Banco Hispano Americano (1913) and Crédito de la Unión Minera (1914)	1913-1914: -0.11
1920	Peak: 1919 Trough: 1920 Stock returns: -0.13	1920: -2.62	Suspension of payments: Banco de Barcelona (1920)	1919-1920: 0.19
1924-1925	Peak: 1922 Trough: 1924 Stock returns: -0.04	1924: -0.25 1925: 0.0005	Trouble in the Crédito de la Unión Minera and Banco Central Number of Banks: 1924-1925: -10 banks	1926-1925: -0.06
1931	Peak: 1928 Trough: 1932 Stock returns: -0.4	1931: -3.3	Banco de Barcelona bankrupted Number of Banks: 1930: -3 and 1934-1935: -4 banks	1930-1931: -0.17
1977-1983	n.a	1977: -2.02 1978: -0.54 1979: -0.50	24 banking institutions were rescued 4 were liquidated 4 merged 20 small and medium banks were nationalised	1977-1978: 0.17

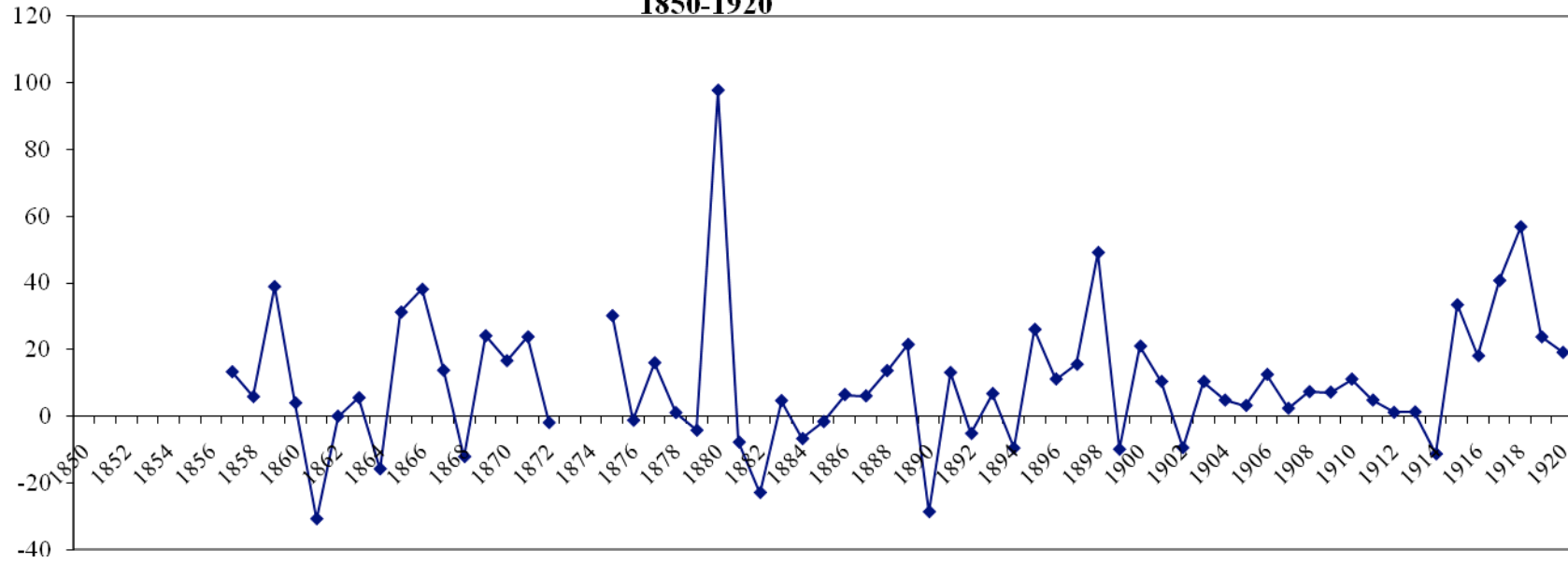
n.a.: not available. *Data on number of banks are different according to different sources because for most of the period there is no banking directory that includes all the banking institutions.

Figure 1. Real Banking Profitability



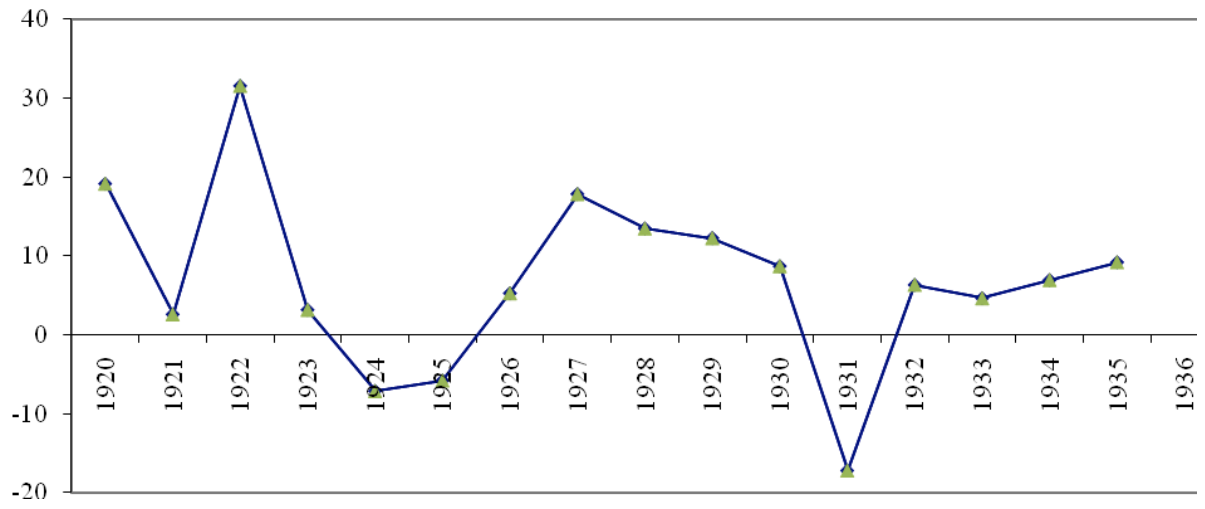
Source: see data appendix

**Figure 2.1: Deposits (Annual growth, %)
1850-1920**



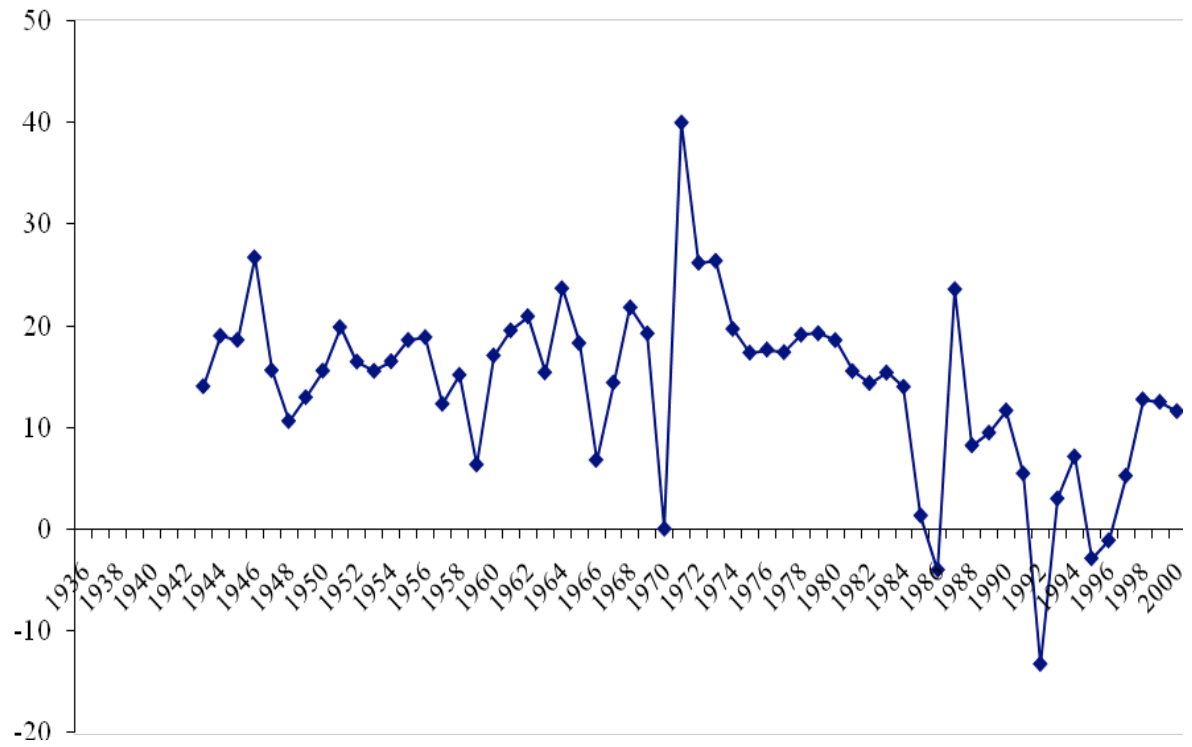
Source: see data appendix

**Figure 2.2. Deposits from banks (Annual growth %)
1920-1936**

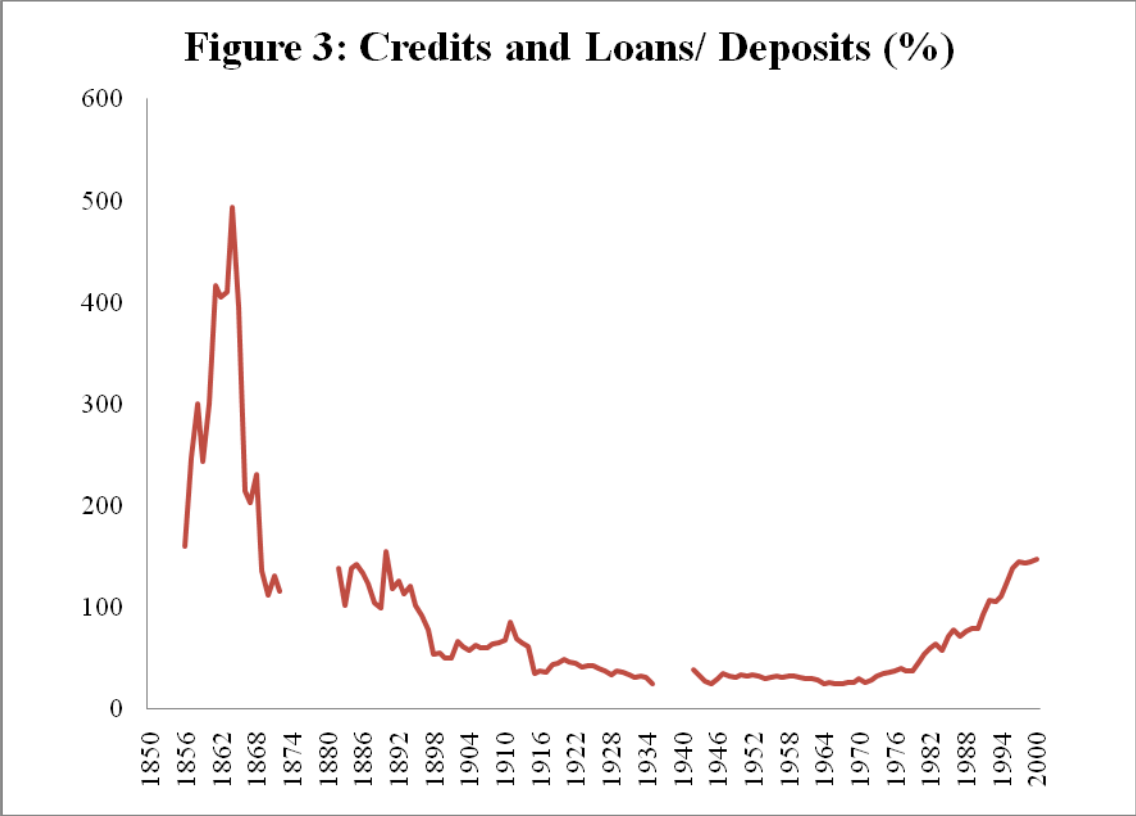


Source: see data appendix

**Figure 2.3. Deposits annual growth %
1936-2000**

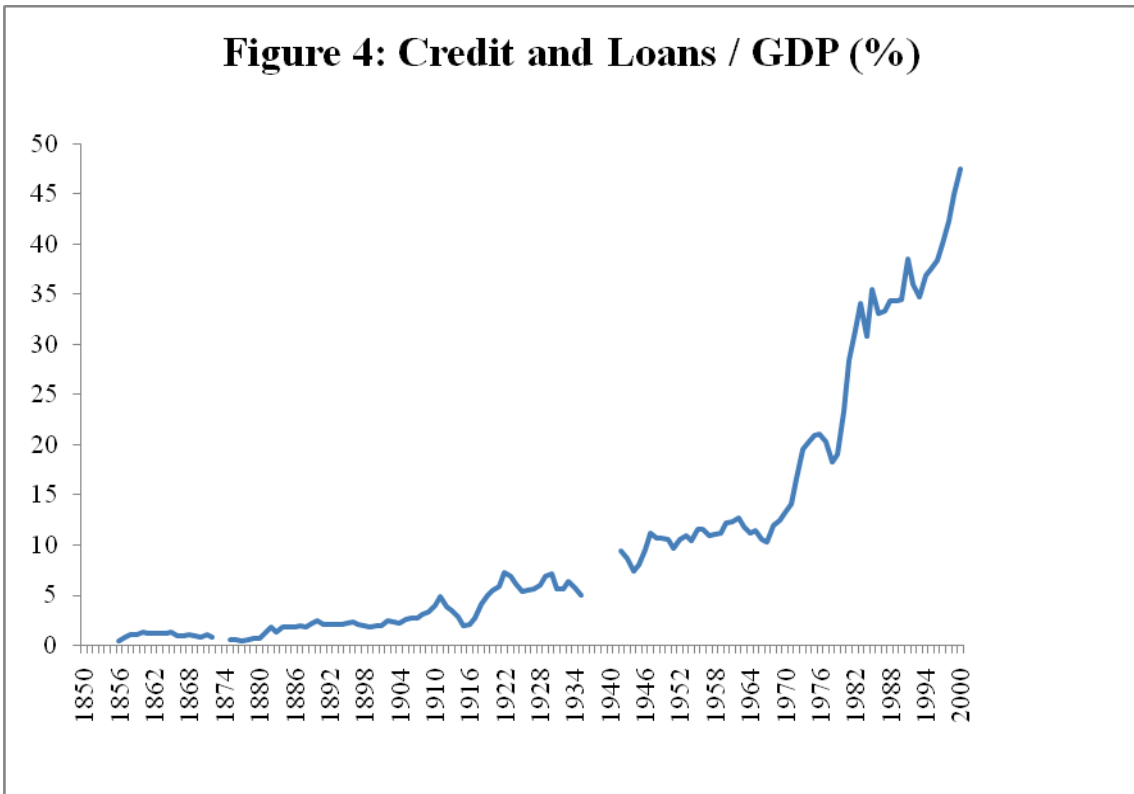


Source: see data appendix



Source: see data appendix

Figure 4: Credit and Loans / GDP (%)



Source: see data appendix

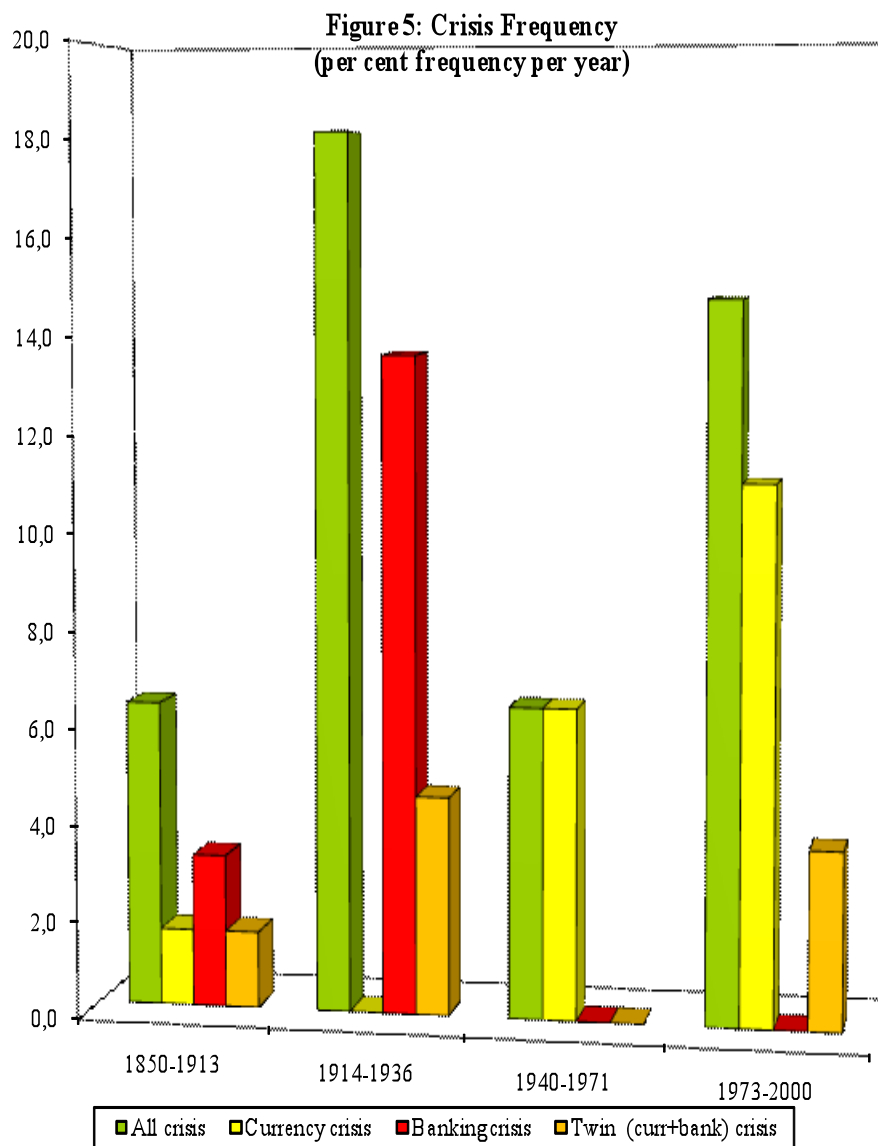


TABLE 4: Crisis frequency comparison

PERIOD	SPAIN	PERIOD	BEKM
1850-1913	6.3	1880-1913	4.9
1914-1936	18.2	1919-1939	13.2
1940-1971	6.5	1945-1971	7
1973-2000	14.8	1973-1977	12.2

TABLE 5: Duration and depth of crises in Spain

SPAIN	1850-1913	1914-1936	1940-1971	1973-2000
	Average duration of crises in years			
All crisis	2.75	1.5	2	4.5
Currency	1		2	2.33
Banking	2	1		
Twin (curr+bank)	6	3		11
	Average crisis depth (cumulative GDP loss in %)			
All crisis	7.53	4.13	4.79	14.54
Currency	0.25		4.79	2.86
Banking	8.17	1.15		
Twin (curr+bank)	13.52	13.04		49.59

Note: Twin is a combination of currency and banking crises.

TABLE 6: Duration and depth of crises in Spain, by year and type of crisis

CRISIS YEAR	TYPE OF CRISIS	AVERAGE DURATION IN YEARS	AVERAGE DEPTH (CUMULATIVE GDP LOSS %)
1866	Banking	3	14.55
1882	Twin (currency + banking)	6	13.52
1890	Banking	1	1.79
1899	Currency	1	0.25
Period 1850-1913		2.75	7.53
1914	Banking	1	3.46
1921	Banking	1	0
1924	Banking	1	0
1931	Twin (currency + banking)	3	13.04
Period 1914-1936		1.75	4.13
1943	Currency	1	0
1958	Currency	3	9.57
Period 1940-1971		2	4.79
1976	Twin (currency + banking)	11	49.59
1982	Currency	1	0
1991	Currency	4	6.25
1995	Currency	2	2.33
Period 1973-2000		4.5	14.54

TABLE 7: Output loss (% GDP)

PERIOD	SPAIN	PERIOD	BEKM
1850-1913	7.53	1880-1913	9.8
1914-1936	4.13	1919-1939	13.4
1940-1971	4.79	1945-1971	5.2
1973-2000	14.54	1973-1977	8.3

TABLE 8: Stock market crises according to the peak to trough method

Stock market period	Assigned year to the stock market crisis
1852-55 and 1856-59*	1855
1861-66 and 1967-69*	1865
1871-74	1874
1881-87	1882
1890-92	1892
1902-06**	1905
1910-14	1912
1915-22	1918
1928-34	1930
1935-40	n.d.
1947-50	1948
1956-60	1959
1974-80	1976
1989-92	1992

Note: * we have jointed these two crises because there was only one year of growth in the middle. ** We can consider this crisis in Bilbao until 1904 as in Madrid

TABLE 9: Stock market crisis in Madrid, Barcelona and Bilbao, 1850-2000

Madrid (1850-2000)	Number	Peak	Trough	Stock returns
	1	1861	1869	-0.58
	2	1871	1874	-0.35
	3	1890	1892	-0.29
	4	1902	1906	-0.62
	5	1910	1914	-0.51
	6	1915	1922	-0.65
	7	1928	1934	-0.65
	8	1935	1940	-0.43*
	9	1947	1950	-0.62
	10	1956	1960	-0.35
	11	1974	1980 ⁺	-1.44
	12	1989	1992 ⁺⁺	-0.33
Barcelona (1850-1936)	Number	Peak	Trough	Stock returns
	1	1852	1859	-0.66
	2	1861	1868	-1.02
	3	1881	1887	-0.70
	4	1889	1893	-0.35
	5	1916	1921	-0.51
	6	1928	1932	-0.57
Bilbao (1891- 1936)	Number	Peak	Trough	Stock returns
	1	1900	1902 ⁺⁺⁺	-0.26
	2	1912	1914	-0.38
	3	1919	1921	-0.73
	4	1928	1932	-0.51
TOTAL	14 (we considered the 1900-02 Bilbao crisis together with 1902-06 Madrid crisis)			

Note: Data for Madrid from refer to the period 1850-2000, for Barcelona to the period 1850-1913 and for Bilbao, 1891-1936. * There are no data; the returns are interpolated from Barro and Ursúa (2009).+ it could be considered until 1982, ++ it could be considered until 1994, +++ it could be considered until 1904, as in Madrid. Total refers to the total number of crises which are in different years. We consider there is only one stock market crisis when various overlapping or adjacent years are involved.

Sources: See text and data appendix.

TABLE 10: Stock market crisis and depressions in Spain, 1850-2000

STOCK MARKET PERIOD	STOCK PRICES OR RETURNS	GDP PERIOD	GDP CONTRACTION	COMMENTS
1852-59	-0.66	1855-57	-0.06	Only in Barcelona. We join the 1852-1855 and 1856-59 crises because there is only one year with an increase.
1861-69	-0.58	1863-68	-0.10	We join the 1861-66 and 1867-69 crises because there is only one year with an increase. In Barcelona 1861-1866. No data in Bilbao
1871-74	-0.35	1873-74	-0.09	Only in Madrid. No data in Bilbao
1881-87	-0.70	1877-79	-0.09	
1890-92	-0.29	1884-87	-0.08	Only in Barcelona In Barcelona 1889-1993. Not in Bilbao
1900-02	-0.26	1892-96	-0.14	Only in Bilbao. We consider until 1904, being the same as in Madrid for the period 1902-1904 Not in Barcelona
1902-06	-0.63	1901-05	-0.07	
1910-14	-0.51	1909-14	-0.08	Bilbao 1912-14. Not in Barcelona
1915-22	-0.65	1916-22	-0.03	Bilbao 1919-21. Barcelona 1916-1921.
1928-34	-0.65	1929-33	-0.09	Bilbao 1928-32. Barcelona 1928-1932
1935-40	-0.43*	1935-38**	-0.33	
1947-50	-0.62	1947-49	-0.02	No data in Barcelona and Bilbao
1956-60	-0.35	1958-59	-0.03	No data in Barcelona and Bilbao
1974-80	-1.44	1980-81	-0.00055	No data in Barcelona and Bilbao
1989-92	-0.33			No data in Barcelona and Bilbao

Note: Stock market crises are cumulative multi-year returns of -0.250 or less. GDP contractions are cumulative multi-year declines of at least 0.10. GDP is real GDP per capita. The GDP reduction is included when the GDP period coincides with a peak-to-trough period in the years around or adjacent to it. When a stock market crisis coincides in several places, the Madrid fall in stock returns is considered.* There are no data; returns are interpolated from Barro and Ursúa (2009), which are calculated over the period that bridged the gap in the annual data.**Coincides with the Spanish Civil War (1936-39).

Sources: see text and data appendix

TABLE 11: Depressions with and without stock-market crisis**Panel A: Stock market crisis and Depressions. Number: 3**

Stock Market period	Stock prices or returns	GDP period	GDP contraction	Comments
1861-69	-0.58	1863-68	-0.098	Considered in the count
1928-34	-0.65	1929-33	-0.095	Considered in the count
1935-40*	-0.43	1935-38**	-0.331	Considered in the count

Panel B: Depressions without Stock Market Crisis. Number: 1

Stock Market period	Stock prices or returns	GDP period	GDP contraction	Comments
		1877-79	-0.091	Near to a contraction. Not considered in the count due to being below -0.095
		1892-96	-0.136	Considered in the count

Panel C: Stock Market crisis without Depressions. Number: 10

Stock Market period	Stock prices or returns	GDP period	GDP contraction	Comments
1852-59	-0.6562	1855-57	-0.060	Only in Barcelona
1871-74	-0.36	1873-74	-0.087	Near to a contraction
1881-87	-0.70	1884-87	-0.078	Only in Barcelona
1902-06	-0.63	1901-05	-0.066	Not in Barcelona
1910-14	-0.51	1909-14	-0.076	Not in Barcelona
1915-22	-0.65	1916-22	-0.033	
1947-50	-0.62	1947-49	-0.019	No data in Barcelona and Bilbao
1956-60	-0.35	1958-59	-0.031	No data in Barcelona and Bilbao
1974-80	-1.44	1980-81	-0.00055	No data in Barcelona and Bilbao
1989-92	-0.33			No data in Barcelona and Bilbao

Note: Stock market crisis are cumulative multi-year returns of -0.250 or less. GDP contractions are cumulative multi-year declines of at least 0.10. GDP is real GDP per capita. The GDP reduction is included when the GDP period coincides with a peak-to-trough period in the years around or adjacent to it. * There are no data; returns are interpolated from Barro and Ursúa (2009), which are calculated over the period that bridged the gap in the annual data. **Coincides with the Spanish Civil War (1936-39).

Sources: see text and data appendix

TABLE 12: Frequency of stock market crashes and depressions

	Number of events		
	Stock Market crashes	Depressions	Both
Total non-war and war period			
Spain (1850-2000)	14	4	3
USA (1869-2006)	7	2	2
25 countries (1869-2006)	195	84	58
Average per country	7.8	3.36	2.32
18 OECD countries (1869-2006)	137	54	38
Average per country	7.61	3	2.11
Non-war period			
Spain (1850-2000)	13	3	2
25 countries (1869-2006)	158	50	32
Average per country	6.32	2	1.28
18 OECD countries	109	28	19
Average per country	6.05	1.55	1.05
War period*			
Spain (1850-2000)	1	1	1
25 countries (1869-2006)	37	34	26
Average per country	1.48	1.36	1.04
18 OECD countries	28	26	19
Average per country	1.55	1.44	1.05

Note: * War periods are limited to active combatants.

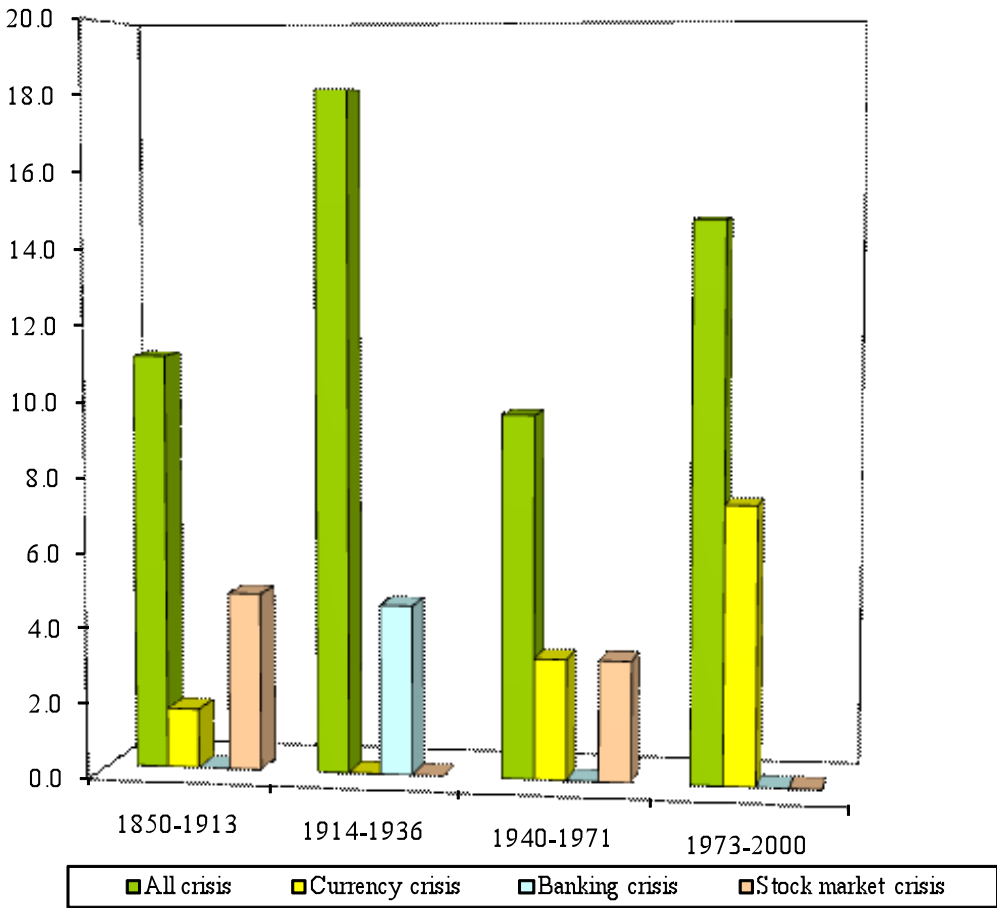
Source: For Spain, see text and data appendix. For USA, 25 countries and 18 OECD countries in Barro and Ursúa (2009).

TABLE 13: Main debt crises (debt over 100%)

% GDP Domestic Public Debt	%GDP Total Public Debt	Reinhart (2010) External Default	Reinhart (2010) Domestic Default
	1850	1851 1837-1867	1936-1939
1874-1881	1868-1882	1877-1882	
1899-1909	1896-1909	1959, 1960 and 1978*	

- Memorandum item on IMP program, 1952-2009: Dates of programs

**Figure 6: Crisis Frequency
(per cent frequency per year)**



**Figure 7: Crisis Frequency
(per cent frequency per year)**

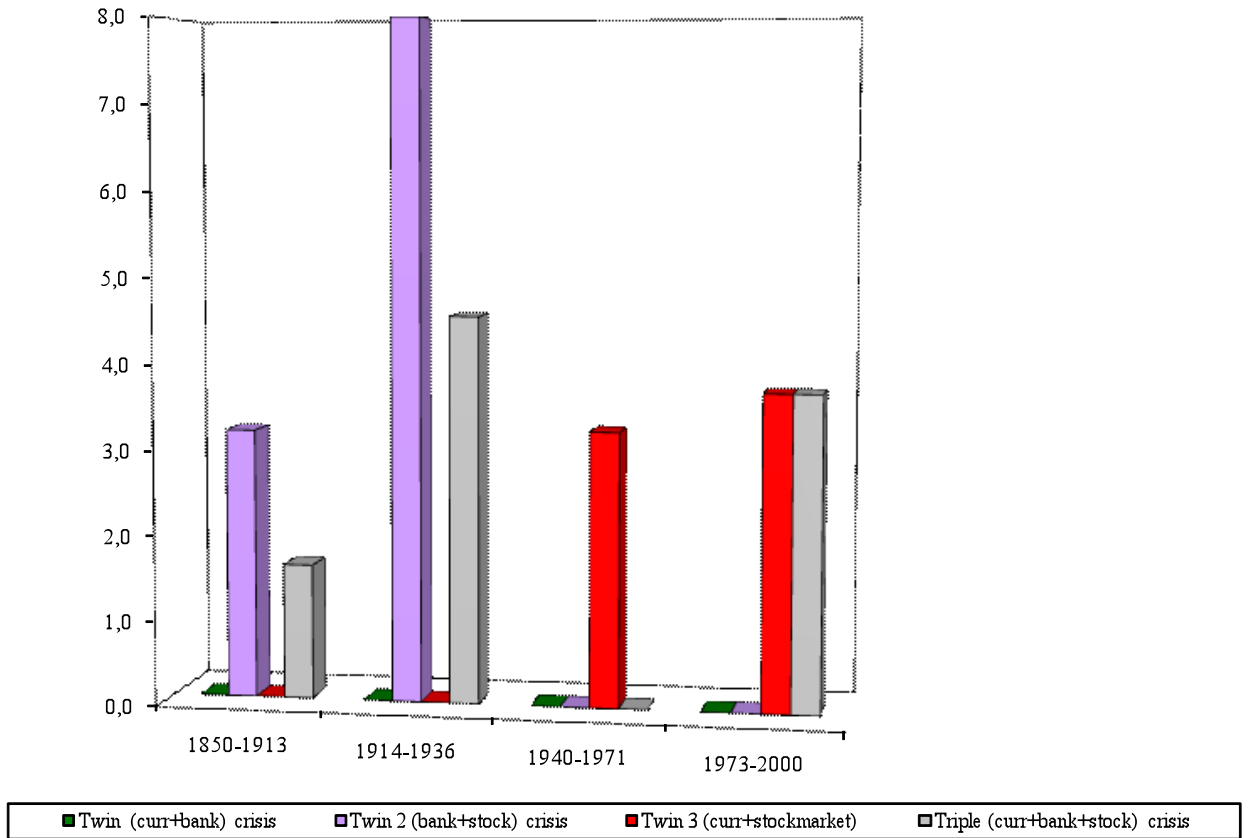


TABLE 14: Duration and depth of crises in Spain with all type of crises

SPAIN	1850-1913	1914-1936	1940-1971	1973-2000
Average duration of crises in years				
All crisis	2.83	1.75	2.33	4.5
Currency	1		1	1.5
Banking		1		
Stock market	1		3	
Twin1 (curr+bank)				
Twin 2 (bank+stock)	2.5	1.5		
Twin 3 (curr+stock)			3	4
Triple (curr+bank + stock)	6	3		11
Average crisis depth (cumulative GDP loss in %)				
All crisis	11.15	4.13	5.85	14.54
Currency	0.25		0	1.17
Banking		0		
Stock market	7.28		7.97	
Twin1 (curr+bank)				
Twin 2 (bank+stock)	14.94	1.73		
Twin 3 (curr+stock)			9.57	6.25
Triple (curr+bank+stock)	13.52	9.57		49.59

Note: Twin 1 is a combination of currency and banking crises. Twin 2 is a combination of banking and stock market crises. Twin 3 is a combination of currency and stock market crises. Triple is a combination of currency, banking and stock market crises.

TABLE 15: Duration and depth of crises in Spain by year and type of crisis considering all types of crises

CRISIS YEAR	TYPE OF CRISIS	AVERAGE DURATION IN YEARS	AVERAGE DEPTH (CUMULATIVE GDP LOSS %)
1855	Stock Market	3	8.71
1866	Twin 2 (banking + stock market)	3	14.55
1874	Stock Market	1	14.55
1882	Triple (currency + banking + stock market)	6	13.52
1892*	Twin 2 (banking + stock market)	2	15.32
1899	Currency	1	0.25
1905	Stock Market	1	0
Period 1850-1913		2.83	11.15
1914	Twin 2 (banking + stock market)	2	3.46
1921	Twin 2 (banking + stock market)	1	0
1924	Banking	1	0
1931	Triple (currency + banking + stock market)	3	13.04
Period 1914-1936		1.75	4.13
1943	Currency	1	0
1948	Stock Market	3	7.97
1958	Twin 3 (currency + stock market)	3	9.57
Period 1940-1971		2.33	5.85
1976	Triple (currency + banking + stock market)	11	49.59
1982	Currency	1	0
1991	Twin 3 (currency + stock market)	4	6.25
1995	Currency	2	2.33
Period 1973-2000		4.5	14.54

Note: Twin 1 is a combination of currency and banking crises. Twin 2 is a combination of banking and stock market crises. Twin 3 is a combination of currency and stock market crises. Triple is a combination of currency, banking and stock market crises. * 1892 stock market crisis and 1890 banking crisis.