Free-banking revisited: the Chilean experience 1860-1898

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Introduction

The main characteristics of what is called free-banking system are freedom of entrance and competitive bank supply of notes under some minimal restrictions from the central authority. Of course, under such a framework neither a central bank nor a last resort lender exist. Since Hayek (1978) seminal work, free-banking theory increasingly regained attention among economists. The discussion between public monopoly and competitive issue of money being revived, some specialists even propose free-banking as a concrete policy for emerging countries[1]. However, it is clear that for most people this kind of schedule would sound rather like a radical option against the legitimacy reached by central banks in this century than as a strictly feasible one. Nevertheless, free-banking has a strong historical background. In fact, during the 18th and 19th centuries we account for near 60 countries that once had this kind of system[2]. A vast literature has been written about the most famous free-banking cases of Scotland[3] (1716-1845) or the U.S.[4] (1837-1866). Some other interesting well-known examples such as the ones of Canada (1867-1908), Sweden (1830-1897) or Switzerland (1826-1850) had also received empirical attention[5]. In opposition there is a lack of knowledge about « peripheral » cases such as those of Latin American countries. This is the more surprising since nations like Argentina (1887-1890), Brazil (1888-1892)[6], Colombia (1863-

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1886) or Chile (1860-1898) adopted free-banking – more or less successfully- by the end of the 19th century.

This paper presents the free-banking Chilean experience between 1860 (date of promulgation of the free-banking law) and 1898 (date at which banks were not allowed to continue issuing money). The Chilean case is particularly interesting for the following reasons. First, the Chilean free-banking was based on heavy liberal regulation which probably put it closer to the pure theoretical framework of free-banking than any other experience. Besides the publication of monthly balances and upper issuing limits linked to a fraction of the effective capital they constituted (150%) the Chilean banking system didn't establish other major limitations for the creation of issue banks[7]. Second, and this is one of the main thesis of this work, the Chilean banking system can be considered as a successful experience in many fields. During this period bankruptcies were rare, the number of issue banks increased over time for most part of the 1860-1898 period, while concentration rates reached reasonable levels at some stages. Furthermore, during the free-banking era, economic growth was important and the domestic capital markets strongly expanded in all its branches (Briones 2001). This « optimistic » version stands in opposition to the traditional view among many historians and observers who regarded free-banking as a permanent source of financial instability and as responsible for the systematic currency depreciation Chile experienced since the 1870's.

This article is the introductory chapter of a more in-depth study about Chilean free-banking and this is why this paper is essentially descriptive. In any case, our approach is quite different from what has been done before for the Chilean case since we focus on quantitative aspects rather than on a pure qualitative analysis. We collected exhaustive year-to-year balance sheet data for each bank during the whole period considered and built a detailed database on every single item presented in the bank balance sheets. This effort hadn't been

undertaken before and can be considered as one of the main contributions of this preliminary research. The data was directly extracted from the balance reports that each bank presented monthly to the Chilean Finance Ministry.

The article is organized as follows. Section one presents the essential elements of the free-banking law of 1860. We also describe the main subsequent institutional modifications affecting the banking system until 1898. Section two explores some microeconomic elements of the banking industry. In particular we focused on bankruptcies as well as on a large series of indicators of competition within the banking industry. In section three, we discuss some macroeconomic implications of the free-banking period. We begin by presenting the overall economic and financial performance Chile had during the free-banking era. In addition, a particular attention is given to the relation between the emission and its impact over the inflation and the exchange rate. The main conclusions are presented in section four.

1-The Banking law of 1860 and the subsequent institutional changes affecting the banking industry

The cornerstone of the Chilean free-banking system can be found in the General Banking Law of July 23rd 1860. This law allowed the creation of this kind of banking institutions without any major constraints from the State. Various modifications were made along the whole period (modifications which will not be treated in detail here). Nevertheless, the free-banking foundation principles of free entry and for creating money remained.

From bimetallism to bank notes

Since its Republican origins (1810) the Chilean monetary system has been based on gold-silver bimetallism. The country experienced some short episodes in which fiduciary money was introduced by the State in order to counteract metallic scarcity as well as over expenses related to independence wars. Nevertheless, since 1826 this State paper money was completely thrown out of circulation and the following quarter century will be one of an in-

depth discussion about the necessity of introducing fiduciary money and, of course, about the entity responsible for note issuing. In 1849, the Government allowed the Chilean businessman Antonio Arcos to found an issue bank (Banco de Chile, Arcos and Co). This initiative quickly encountered a strong opposition among Valparaiso's (main financial center at this time) merchants and the bank was forced to close just one year later. However, this short experience can be seen as a first signal of what was unavoidable during the following next years: the foundation of a formal banking system. Indeed, during the 1850's three formal commercial banks - « Bezanilla and Mc Clure » (1854), « Ossa and Co» (1855)[8], « de Valparaiso » (1856) and the State owned Mortgage institution, the « Caja de Credito Hipotecario » (1855) - were created. This first emergence of formal banks can be explained by the creation of a new institutional framework that defined civil and commercial rights and, by this means, encouraged entrepreneurship.

Meanwhile, the discussion around the pertinence of allowing note issue continued. This debate was lead by two opposite positions: defendants of some kind of State monopoly and partisans of a decentralized system in which private banks must ensure the emission. The promulgation of the General Banking Law of July 23rd 1860 decided the discussion in favor of the latter.

The banking law of 1860

The banking law of 1860 had a strong liberal inspiration which was no other than the one of its creator, the French economist Gustave Courcelle-Seneuil[9]. It was based, of course, on free entry and competition among private note issuers but also on deep faith in market self-regulation mechanism for emission. In Courcelle's words emission could not go naturally beyond the real market demand for money[10]. Courcelle's argument is as follows. Under competitive supply of money any excessive emission from any single bank would only cause a loss of its credibility among noteholders. As a result, these would quickly convert their notes

and thus cause the bankruptcy of the bank. Since no banker desires a default, this natural mechanism imposes a responsible behavior when issuing notes. But if Courcelle argued that financial difficulties could not come from an excessive emission, he nevertheless pointed out that problems could result from a poor management and a bad portfolio of liabilities rendering banks unable to pay their debts at a given moment. Courcelle claimed that, in order to avoid this potential adverse scenario, banks needed no more than a reasonable amount of capital to respond to their obligations. As we will see this provision was explicitly included in the law. The main features of the 1860's banking law can be summarized as follows.

- **Convertibility:** Notes had to be paid in specie (silver or gold) in sight and on demand (Art. 26 and 27).
- **Freedom of entry:** The law stated that every person apt to begin commercial activities can base a bank of issue (Art.1)
- **Capital as issue backing:** One of the key distinctions of the Chilean banking system is that the law did not force the banks to hold a metallic or specie reserve backing against its emission[11] but just a minimal capital [12]. We are thus under a variant of the pure fractional reserve model. The Chilean law restricted the stock of issued notes to 150% of the paid capital (Art. 29). In addition, it established that the paid capital could only be constituted by specie or short term (less than 6 months) debt of "very well known and solvent people" (Art. 6). Notes had to be double-coupon numbered and signed by the bank director and the Governor of the Casa de Moneda (the State). One coupon had to stay at the Casa de Moneda as a control of the registered emission (Art. 14).
- **Transparency and Accounting information**: The law of 1860 obliged banks to publish detailed monthly balances that had to be transmitted to the Finance Ministry (Art. 8 and 30). In addition, the President of the Republic was in charge of revising the accounting information when a new bank opened (Art. 5). Besides, the Law of 1860 obliged banks to

indicate in a special account of the balance the loans to its managers and directors (Art. 10). Non-compliance with these arrangements entailed important fines (Art. 24 and 25).

- **Corporate governance**: The law also established a series of conditions preventing frauds and aligning administration and noteholders interests. For example, the director of the bank was obliged to constitute a stock guarantee for an amount of 10 % of the total bank capital against the obligations engaged by the bank during his mandate (Art. 9). Furthermore, owners had unlimited responsibility against the bank duties (Art. 26). This meant that if bank asset were eventually not sufficient to pay its liabilities, bank owners had to respond with their personal wealth.

Summarizing, the General Banking Law of 1860 set an important degree of freedom for the establishment of note issue banks. For instance, the classical specie reserve backing or specific asset provisions against liabilities were absent. Only duties of periodical reports about the financial situation of the bank and the setting of an issue amount limited to one and half times a precise kind of capital can be seen as the major constraints for banking activity. For the remaining, banking business was self-regulated.

Subsequent institutional changes:the inconvertibility era and the gold standard period

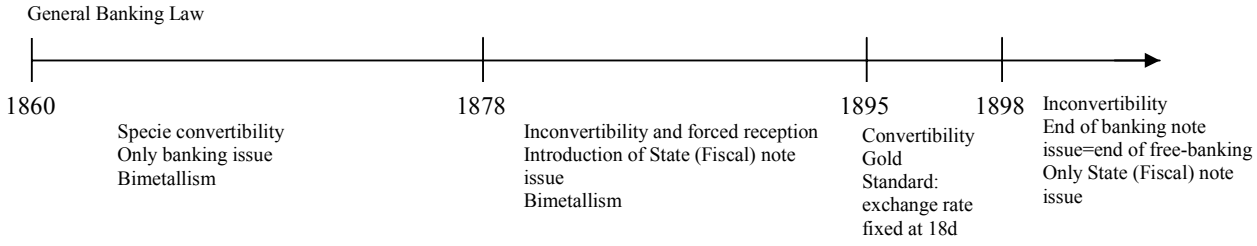
In 1878 the Chilean banking system experienced an important liquidity crisis. The major Chilean banks such as the Banco Nacional de Chile and the Banco de Valparaiso (together accounting for almost 60% of the total deposits and for 55% of the total bank notes) experimented a severe diminution of their specie reserves as long as notheholders run to convert their notes. Faced with the huge difficulties of the country's biggest banks and for many reasons we do not develop in this article, the Government prevented them to default. As a result, on July 23rd of 1878 the Government passed a Law establishing the forced reception and the inconvertibility of the bank notes. At the same time, the law constrained banks to cumulate specie reserves or bonds in order to redeem their notes once convertibility would be

resumed. In principle this law had to be transitory, just providing time to banks to improve their specie reserves before returning to convertibility. The initial date of return to the full convertibility was set at August 31st 1879 but immediately another law (September 6, 1878) delayed the convertibility until the Mai the 1st 1880. During the whole inconvertible period the freedom of entrance and the right of banks for issue notes prevailed. Nevertheless, the banks had no more the exclusivity of note issuing since, starting at 1879, the State begun to print its own notes (fiscal notes) and became rapidly the major supplier of paper money. In practice, the inconvertibility law established a limit for the amount of notes that each bank could be declared as inconvertible and allowed them to still issuing "convertibles" notes for a maximum amount of 150% of their paid in capital as it was established in the 1860's former banking law. Nevertheless these "convertible" notes were quite different from the ones convertible in specie since banks had the right to simply convert them into their own inconvertible emission or into inconvertible fiscal notes. On Mai the 1st 1880 the inconvertibility of bank notes theoretically ended. Nevertheless the inconvertibility of fiscal notes remained. As a consequence, even if in theory the banks were forced to convert their notes in specie, they could simply redeem them into inconvertible fiscal notes. The latter meant that, in practice, the inconvertibility *régime* went far beyond the 1880's deadline. As a matter of fact it prevailed until 1895.

After several years of debates during the 1890's, finally on February 12 of 1895 the Parliament passed a law ordering a gradual return to convertibility starting on June the 1st 1895. To do so, Chile adopted the gold standard with an implicit gold exchange rate of 18d per Peso. The law stated that, on demand, fiscal notes were immediately (starting on June the 1st) redeemable in gold or in silver (only if the value of a silver Peso was over 18d). It also considered a complete conversion of the remaining (if applicable) fiscal notes by December the 31st 1897. Regarding bank notes, the law forced the banks to cumulate a one to one ratio

in gold, fiscal notes or bonds that must be deposited at the Casa de Moneda as a guaranty against the emission that had to be converted. The deadline for the full conversion of banks notes was set at December the 31st 1897. Meanwhile the bank notes that were guaranteed in the way we aforementioned were accepted by the State as payment for tax or other debts in favor of the State. However, by the end of 1898 the banks were not able to fully convert their notes. This is why on July the 31st a new law declared all the remaining banknotes as fiscal notes, reestablished the forced course and the inconvertibility and avoided banks to still issue paper money afterwards. The latter implied the end of the free-banking period as well as of this short period of convertibility and gold Standard era. Afterwards only the State was allowed to issue paper money.

Summarizing, we can say that from an institutional point of view the free-banking era can be split in three sub-periods. Between 1860 end 1878, the system operated under a *régime* of full convertibility in specie. During the following seventeen years, the context was one of inconvertibility and forced reception of notes as well as increasingly important State's note issuing. The 1895-1898 period marked a short return to convertibility as well as the replacement of the bimetallic system by the gold standard criteria. Afterwards, inconvertibility was readopted (1898), and the State was in practice the only one allowed to issue paper money. The following figure summarizes these major institutional changes.



2- Microeconomic elements of the Chilean banking industry

In this section we focus on some accounting indicators of the Chilean banking industry. This micro-level analysis is interesting because, in a certain sense, it tells us the way the banking system was structured and functioned. Of course an analysis at this level requires a detailed information on any of the single actors of the banking industry. The latter is possible only if one is able to have separate balance sheets for each bank. This was precisely the challenge we assumed in this work. We collected directly from the Chilean Finance Minister Archives[13],.year-to-year balance sheets for each of the existing banks and for the whole period considered. A typical balance sheet had more than twenty separated items both on the asset and liabilities side (typical balance sheets are presented in appendix #1). The latter allowed us to build a concise financial database and to calculate many valuable separated financial indicators. The evidence we present will help us to respond to the following questions. Was the banking system cartelized or, on the contrary, was it competitive? Was the banking business profitable and, if so, was it for all the banks? Were bankruptcies a common task along the free-banking period or, on the contrary, default rates were not so important?

We proceed to study the free-banking market structure at four different levels: 1) the number of banks that existed during the period as well as their foundation and closing dates, 2) the bankruptcy cases, 3) the degree of concentration within the industry and 4) the profitability of the banking sector.

Number of banks

Between 1860 and 1865 only one bank –the Banco Nacional de Chile- was formally registered as a note issue bank. Afterwards an important number of note-issuing institutions began to enter to the market. If in 1866 we count 5 note-issuing banks, by the beginnings of

the 1890's Chile's number of banks reached a peak of 24 issue banks and ended the period (1898) with 17 institutions. During most part of the free-banking era, there were almost no pure commercial banks and it was only since the end of the 1880's that they will attain some relative importance. Figure #1 presents this evolution.

[Insert Figure #1]

During the whole period, 34 note-issuing banks existed at one moment or another. Table #1 reports these banks, indicating their founding year, the first year they issued notes and, if applicable, their closing date.

[Insert Table #1]

Bank failures

When looking at the number of issue banks that remained in business by the end of the nineteenth century (17) one might think that a half of them failed. The reality is more complex than this. For instance, let us say that a closed bank is quite different from a failed bank[14]. Among the banks presented in Table #1, three of them - Banco de Mac Clure, Banco de Matte and Mac Clure and Banco de Matte- are exactly the same and a simple modification of its names occurred between 1854 an 1876 (i.e. there is not closed bank at all). In addition, four other nominal "disappearance" cases were not associated with banking failures but with merging and acquisition processes. These are the cases of Banco Sudamericano which was bought in 1873 by the Banco de Valparaiso and of Banco Agricola, Banco Nacional de Chile and Banco de Valparaiso which merged in 1892 creating the so called Banco de Chile. Of course, merging can obey to financial problems (specially liquidity problems) but also to strategic considerations such as scale or scope economies. In any case, mergers must be seen as an endogenous response of the market that is clearly different from what we will define as a failure.

We consider that a failure arises when a bank is unable, at a given moment and under demand, to fully redeem their liabilities immediately. As a consequence it is forced to close,

liquidate their assets and then pay (partially or not) its debts. Notice that under this definition a pure closing in which all short term and long term liabilities are immediately fully paid does not fit in our definition. In fact, such a closed bank would be simply getting-off of the business in the same way that any merchant would like to switch from its commercial activity (we call this situation case 1). Moreover, this definition admits two interesting cases that will be relevant for our analysis. First, when the bank assets are potentially enough to completely redeem its debts but the bank is confronted with liquidity problems that prevent it to do it immediately. In such a situation, we should expect that the bank in trouble be purchased by another institution that will simply provide the short term liquidity, and then make an earning by selling the illiquid assets of the failed bank. In other words, we would have a market mechanism that would be able to resolve the failure problem at the same time that noteholders and depositors will recover their money. Certainly this situation reflects some kind of management problems (because of the liquidity problem) but it is also true that at least the bank has a positive net worth (we call this situation case 2). The second case arises when, even by selling its assets, the bank is not able to fully pay its liabilities. In this situation the bank is not only facing liquidity problems but either there is a value destruction (its net worth is negative), a noteholder expropriation in favor of bank owners or a combination of both (we call this situation case 3).

Among the cases of closed banks, we are sure that Banco de Credito Unido redeemed all its notes before closing in 1897 (case 1). In three out of the ten remaining closing banks (Banco Alianza, Banco Ossa and Banco Consolidado) the liabilities were taken over by the Banco Nacional (for the first couple) and by the Banco de Valparaiso for the third. The latter suggests that these three institutions had a positive net worth and that the market mechanism described in case 2 operated. We do not have information allowing us to establish if for the remaining seven failure cases the liabilities were redeemed or not (and in which proportion).

Therefore, we supposed the extreme case in which debts were not fully paid. Table #2 summarizes the aforementioned results.

[Insert Table #2]

Depending on the failure definition we adopt, the proportion of failed banks to the total number of banks that existed at one moment or at another during 1860 and 1898 would be between one fifth (20,5%) and something less than one third (29,5%). This last failure rate is in line with the evidence collected by Rolnick and Weber (1983)[15] for the supposedly successful example of the State of New York during U.S. free-banking experience (36%) and is lower than the U.S. average rate (48%).

More important than determining the number of failed banks is to see if the monetary losses involved in the seven cases in which banks wouldn't have been able to fully redeem their liabilities were important or not in relation to the whole banking system. Let us focus on notes redemption and assume the extreme case where these seven banks were unable to pay no single note at all (this is the upper bound for losses due to unpaid noteholders). Expressed as a proportion of the total amount of bank notes in circulation, we find that the notes of the failed banks never went beyond 1,2%. In other words, these bankruptcies were associated with small banks which had a marginal effect over the whole system. The same conclusion is obtained when looking at deposits instead of notes. The losses that would have been suffered by the noteholders during these failure episodes can also be expressed as average annual rates in relation to the total stock of circulating notes (or deposits) for the whole period 1860-1898. This annual rate is about 0,25% for notes and 0,12% for deposits. The average loss rate for notes is similar (0,18%)[16]to the one reported by King (1983) for N.Y. (1842-1863) as evidence supporting this successful example inside the U.S. free-banking system[17]and is lower than the natural depreciation (because of utilization) of a metallic coin. Table #3 summarizes these results.

[Insert Table #3]

Table # 3 also shows that, with the exception of Banco del Sur, the failed banks had been in business for far more than a year. The latter, suggests that the Chilean free-banking failures were not associated with what is called « wildcat banking »[18] as reported by Rockoff (1974) for many cases in the U.S.[19]. Typical test à la Rockoff for wildcat banking consists in considering a bank as wildcat if its failure occurred less than a year after its creation. Some other tests are based on geographical distance from to the main towns. In the Chilean case neither the duration test nor the geographical approach appears to be significant. In fact, almost all Chilean failed banks have operated for more than three years (the average being of 7 years) and all of them were implanted in the most important cities of the country[20].

Competition

As we have seen, during a long part of the period the Chilean banking system exhibited a rising number of free-banking institutions. The latter can probably be seen as indicating an increasing degree of competition. Nevertheless, this simple observation, because it gives the same weight to each bank, could be misleading. In this section we provide some alternative and more accurate measures of banking competition.

Under a pure competitive theoretical framework one can expect that, as long as « excessive » profits exist, new institutions will enter in order to catch some share of the market. Moreover, in the extreme case, one can expect that each bank would have exactly the same market share. Of course, such « ideal » conditions never exist but, under a reasonable competitive environment, one could expect to observe at least two things: 1) that there is not an excessive degree of concentration and that 2) if it is not the case, the concentration levels must be falling over time as new entrants try to catch the excessive profits of former banks. Because the Chilean regulation guaranteed the free entry and imposed only minimal restrictions for bank creation, it theoretically offered the ideal incentives for accomplishing

these conditions. In order to test these hypotheses, we provide two alternative indexes of banking concentration. The first simply consists in measuring the market share of the major banks (in this case the market share of deposits for the three major banks). The second is what is called Herfindahl-Hirshman index (HHI). Instead of taking only the major banks, this index has the advantage of including all existing banks in one single measure that calibrates for the relative weight of each bank[21]. In practice, for the HHI the standard criteria to determine whether the market is atomized or not, assume that values lesser than 0,1 represent a competitive market. Between 0,1 and 0,18 the industry is considered as having a moderate degree of concentration. Above 0,18 market is viewed as highly concentrated[22]. The evolution of these two measures of concentration is presented in figure #2.

[Insert Figure#2]

When looking exclusively at the market share of the three major banks, one is tempted to say that the overall tendency was towards a decline in the concentration rates. In fact, if in 1866 the three major banks accounted for 85% of the total deposits, by the end of the period this proportion dropped to 65%. In this sense one could say that the second condition aforementioned is fulfilled. Nevertheless, in absolute terms, concentration rates were always important[23]. In particular, as figure #3 shows, two banks -Banco Nacional de Chile and Banco de Valparaiso- had permanently accounted for more than half of the market.

[Insert Figure #3]

The HHI complements this information but provides a more accurate picture of the story. First, it shows that the phase of declining concentration didn't stop at the end of the period but already by the beginnings of the 1890's (just a few years before the return to convertibility in 1895). Afterwards concentration almost regained the levels of the beginning of the period. According to the criteria we defined earlier, concentration levels declined from "highly concentrated" by 1866 (0,33) to "moderately concentrated" by 1890 (0,17). In

addition the evidence presented indicates that this "competitive phase" can be split in two sub-periods. One corresponding to the first convertibility period (1860-1878) in which competitiveness increased (the HHI dropped to 0,19) and a second one associated with the inconvertibility period (1878-1895) in which concentration first re-increased and then declined again since the end of the 1880's. So, as a partial conclusion we can say that the evidence we presented for competition among banks is mixed. On the one hand, concentration exhibited an overall declining tendency reaching, at some moments, levels that can be viewed as reasonable. On the other hand, it is clear that the Chilean banking industry was far from showing a degree of competition according to the one we could have been expecting from the flexibility and liberality of the law which inspired free-banking. A more detailed response to this apparent paradox will be developed in a prolongation of this current research.

Capitalization and banking profitability

A complementary way to test the competition hypothesis consists in looking at the profitability of the banking system and, especially at the one of the major banks. During the period under analysis, the banking business seemed to be highly profitable. On average, the ratio of annual earnings to paid in capital was almost always above 12%[24]. However, from an overall point of view, profitability tended to decline over time. As figure #4 shows, if by the 1860's the annual average earning rate of the banking system was close to 17% of its paid in capital, by the 1890's this ratio attained only 10%. This observation would be in line with the fact that as long as « excess profits » exist new banks had the incentives to enter, catching some part of these excessive earnings hus diminishing the average profitability of the industry.

[Insert Figure #4]

Interestingly, profitability did not fall homogeneously over time. It is possible to distinguish three main phases, which in turn are correlated with both the institutional changes

we presented in section (1) and the HHI evidence we reported previously. Until 1878 (first convertibility period) the banking returns were declining: profits fell from near 20% of the paid in capital to something less than 12%. The latter would be indicating that an increasing level of competition existed. In opposition, the inconvertibility period seemed to have reverted this tendency. Immediately after the instauration of inconvertibility, the profits augmented. Despite the fact that numerous new banks have been established afterwards (specially during the 1880's), until 1895 these high returns levels stayed relatively stable at around 18% of the paid in capital. Finally, the return of convertibility that occurred between 1895 and 1898 caused a new decline in the banking earnings ratios. In a general way, all happens as if during the convertibility periods the market mechanism eliminating « excess profits » functioned. On the contrary, the inconvertibility era seemed to have operated as a kind of shield or protection for banks (or some banks) and their returns. As presented in figure #5, this conclusion is even more clear if one looks at what happened to the profitability rate of the major banks such as Banco Nacional de Chile and Banco de Valparaiso. During the first convertibility period their rates of return were declining and they ended the period with profitability rates below the market average. During the inconvertibility exactly the opposite happened and the major banks obtained gains well above the market[25]. Naturally, as presented in figure #6, the evolution of the profitability of these banks was also translated into their stock market value.

[Insert Figure #5 & Figure #6]

Interest rates

Figure #7 shows the 90 days lending and deposit rates. Two interesting observations can be made. The first is related with the interest rate spread. The evidence presented shows that spread was quite lower during the first convertibility period (an average of 3,5% for the 1866-1878 period) than the one registered during most part of the inconvertibility era (5% on

average for the 1878-1892 period). Since the spread can be seen as a measure of competition[26] this evidence is interesting because it is in line with the general conclusions we made in the previous sections. Second, as we could have expected, the major periods of interest rate increases corresponded to the 1878's crisis and the gold convertibility era (1895-1898)[27] since during both episodes the banking system would have been experienced liquidity problems and a lack of confidence among noteholders. Even if the goal of this paper is not to evaluate how deep these crises episodes were, let us simply notice that in each of these episodes the interest rate increased only in « moderate » fashion as compared with the raise one could have expected in a deep liquidity crisis (from 8,5% to 11% during the 1878 crisis and from 8% to 10% at the end of the gold convertibility period).

[Insert Figure #7]

3- Some macroeconomic considerations of the free-banking period

Economic growth and capital market development

From a theoretical point of view it is clear that a sound banking system produces spillover effects over the other branches of the domestic financial system as well as over the economic activity. Even if it is difficult to quantify these effects, it is very clear that for the Chilean case the free-banking period coincided with an era of economic expansion as well as an important development of the Chilean capital market as a whole. In fact, during the second half of the 19th century the main formal financial activities such as the stocks, the long term debt or the mortgages market registered a huge expansion. This development can mainly be explained by the creation of an inexistent institutional framework (rule of law) that defined property rights and set with precision the duties and responsibilities of the market agents. In addition to the Banking Law of 1860, important examples of this kind of new legal institutions are the Companies Law of 1854, the Mortgage Banks Law of 1855, the Civil code

of 1857 and the Code of Commerce of 1865. In Briones (2001) we presented a more detailed analysis of the evolution of this new regulation framework. In addition we calculated a quantitative measure of the capital market development by reporting over time the ratio of total financial assets of the economy[28] to GDP. If by 1870 the total financial assets represented only 40% of the domestic GDP, by the end of the century this ratio raised to 60%. During the same interval the stock market capitalization passed from representing 20% of GDP to levels close to 35%. In the same way, the mortgage market (representing the most important domestic private long-term market) increased from being near 3% of the GDP in the 1860's to 15% of the GDP by the end of the century. Figure #8 summarizes these previous findings.

[Insert Figure #8]

The capital market expansion was also accompanied by an important economic development. During the second half of the 19th century, the Chilean real GDP augmented by nearly four times. In particular, between 1860 and 1898 the real per capita GDP grew at an average annual rate of 2,1%. As presented in table #4, this economic growth rate can be very favorably compared from a long-term historical comparative perspective.

[Insert Table #4]

Moreover, the Chilean economic performance during the free-banking period can also be evaluated in successful terms when compared with Latino-American countries like Brazil, emerging countries like Australia or even to well developed countries such as the United States or Europe. Figures #9 to #12 present the evolution of international per capita GDP as a fraction of the Chilean per capita GDP.

[Insert Figures #9 to #12]

Aggregate note issuing: from banking emission to fiscal notes

Let us begin this section by pointing out some important methodological aspects about our estimations of the total banking emission. From a macroeconomic point of view, in this section we are interested in estimating the total amount of notes held by the public because this is the relevant measure of the high powered money. The monthly balance sheets we collected provide three different types of information about note issuing. From the liabilities side they accounted for the total stock of money the bank issued. From the asset side two items are presented separately: « own notes » and « other banks notes » detained in cash. As a first step, we deducted the « own notes » item for each bank obtaining what we will call the «net stock of notes» produced by any single bank. The simple aggregation of these amounts determines the total net amount of bank notes at each moment. This information is reported in figure #13. However, because each bank also detained «other bank notes» in cash, this simple aggregation procedure is not an accurate measure of the total amount of notes which are effectively outside the banking system (in the hands of the public). Unfortunately the « other banks notes » item does not provide details about the amount of each of the other bank notes detained in cash by each single bank. In this sense, we are only able to present the aggregate amount of banks notes in the hands of the public (figure #14) but impeded to compute the effective amount of bank notes in the hands of the public[29] of each of the banks.

[Figure #13 & Figure #14]

If one looks exclusively at the net emission (figure #13), one could conclude that note issue increased until 1895. In particular, between 1866-1895 its annual average expansion rate would has been of about 8,8%. As we aforementioned, this figure could be misleading. If we look at the notes that were effectively outside the banking system (in the hands of the public), the picture was somewhat different. *Grosso modo*, the circulating bank notes expanded just until the end of the first convertibility period but diminished afterwards until the period of

gold convertibility. Why did the amount of circulating bank notes decline after the instauration of the inconvertibility in 1878? As figure #14 shows, the main answer can be found in the introduction of a second supplier of paper money: the State. In fact, just after the inconvertibility, the State begun to produce its own paper money and the amounts of fiscal notes in the hands of the public[30] were far beyond than the banking emission. Because the fiscal note can be seen as a perfect substitute of the bank note[31], it is not surprising to observe that the bank notes in the hands of the public have diminished during the main part of the inconvertibility period. During the return to convertibility, both fiscal and banking notes must be converted in specie and this is the main reason explaining the huge drop in the total circulating notes (fiscal and bank notes) between 1895 and 1898. After 1898, inconvertibility was readopted and private banks were, in practice forbid to continue to issue notes. As a result, the fiscal notes will be the only paper money in circulation afterwards. This was the end of the free-banking period. Because of its important amounts, fiscal notes will introduce some important modifications in the way the free-banking system operated until 1878. Between 1879 and 1898, on average near 65% of the total notes will be produced outside the competitive banking system. The way this fiscal emission affected the banking industry will be treated in more detail in a forthcoming paper. Currently, we are able to say that after 1878 we cannot properly speak about a pure free-banking system in Chile.

Inflation rate and overemission

One of the key elements behind the free-banking theory is that optimal emission would be self-ensured. Banks would provide simply as much notes as the market and the economic conditions require. The latter means that no excessive emission would be possible. One way to test this proposition is simply to reformulate it in terms of the classical quantitative monetary theory (MV=PQ). If we suppose that the circulation velocity is near constant, all the money creation above the real necessities of the economy must be translated

into pure price inflation. Figure #15 plots an index of the real GDP (that can be viewed as the « real necessities » of the economy) and an index of the consumer prices[32].

[Insert Figure #15]

During the 1860-1898 period the average annual inflation rate was moderate (3,3%). Moreover, until the 1880's decade its volatility was also low. Let us say that, in practice, until 1878 the Chilean economy had an almost fixed exchange rate (we will develop this point in the next section) and thus it functioned as a nominal anchor against inflation. Not surprisingly during this period the average inflation rate was quite inferior (1,3% per year) to the average rate for the whole period and, for instance, of the inflation rate of the inconvertibility era[33]. Since 1878 and because of the silver depreciation in the international markets, Chile's bimetallic system moved to a *de facto* silver standard and the nominal anchor was lost. In addition, as we have seen, since the instauration of inconvertibility in 1878 a new supplier of paper money –the State- came in to scene and thus we were in a case in which the monetary determinants of inflation did not depend from a single agent (banks) but from both the bank emission and the State emission. We also have pointed-out that the State emission was by far superior to the banking one. In this context, it is not surprising to find that the major inflation episodes coincided precisely with massive increases in the emission of fiscal notes. Notice that just after the first fiscal emission (1879), the inflation raised immediately to 11%. Because no new major fiscal emission occurred afterwards until the end of the 1880's, and also because the bank emission tended to decline, the inflation remained stable during the following ten years. Nevertheless, by the beginnings of the 1890's the fiscal emission more than doubled and, as a result, Chile experienced its major inflation episode: 22% in 1893 and 15% on average for the whole 1891-1894 period. Afterwards, between 1895 and 1898, the return to convertibility produced a dramatic decline in both State and Bank notes in circulation. As a consequence, Chile plunged into a brief deflationary process.

Summarizing, the inflation evidence we have presented shows that, with few exceptions, the free banking-period was far from being inflationist. In other words, the traditional arguments stating that banks would have overissued notes seems not to be confirmed in practice. During the inconvertibility period every inflationist episode was related not to an expansion of the circulating bank notes but with a sharp increase in the production of fiscal notes. Furthermore, we can think that banks played exactly the opposite role than the one attributed to it by its critics. Because of the substitution effect between banking and fiscal notes, every time that fiscal notes expanded, the bank notes in the public hands diminished, avoiding this way a further increase in the domestic prices. One could point-out that the huge price stability that Chile experienced during the first convertibility period (1860-1878) couldn't be attributable to banks but to the nominal anchor Chile had in practice. This argument is pertinent except for one point: this nominal anchor was only possible if convertibility was granted or at least credible. This is what happened for nearly twenty years and it is difficult to believe that an extremely unsound banking system could have allowed accomplishing such an objective for so long.

The banking system and the exchange rate depreciation

Between 1860 and 1878 the Chilean Peso lost 45% of its value against the British Pound. Many authors (Espinoza 1909, Ross 1886, Santelices 1889, Fetter 1937, Millar 1994) have argued that this huge depreciation had its main causes in the free-banking system and their excessive emission. Looking at the inflation evolution, we already have shown that the bank's « overissue » argument is open to criticism. An analysis of the fundamental determinants of the exchange rate during this period will also allow us to put this discussion in perspective.

Since the monetary law of 1851 and until 1895, the Chilean economy was theoretically under a bimetallism silver/gold *régime*. Any liability can be paid either on silver or gold, and

later, when inconvertibility was introduced, also in paper money both fiscal and banking one. Afterwards, between 1895 and 1898 the *régime* moved to the Gold Standard and the exchange rate was simply determined by the gold countenance of the Chilean gold coins (*mint parity*). During the Chilean Gold standard era, this mint parity was fixed at a rate of 18d per peso.

Under the bimetallism the implicitly legal relative price between gold and silver established by the 1851's law was of 1 :16,3902. In this context, the international relative price for silver and gold adjusted for arbitrage costs (mainly shipment, insurance and interest opportunity cost) between London and the Valparaiso financial center defined exit and import points for silver and gold. Supposing that the potential metallic exports from Chile didn't have influence into the international bullion market price (little country hypothesis), the border conditions for exit points of silver and gold can be expressed as follows.

$$1)\ LP_t^{Au,Ar}(1-C_t^{Ar})(1-C_t^{Au})>P^*_t{}^{Au,Ar} \qquad \textit{Silver export, Gold import}$$

$$2)\ LP_t^{Au,Ar}/(1-C_t^{Au})(1-C_t^{Ar})<P^*_t{}^{Au,Ar} \qquad \textit{Gold export, Silver import}$$

Where $P^*_t{}^{Au,Ar}$ is the international price of gold in terms of silver, $LP_t^{Au,Ar}$ is the legal parity between gold and silver, C^i is the arbitrage or transaction cost (in percentage of the total) for metal *"i"*. The Shipment-insurance cost (one way trip) can be estimated at 3,5% for silver and 3,25% for gold[34]. The opportunity cost is assumed constant at 1,5%[35]. For simplicity we assume that C_t^{Ar} x C_t^{Au} is equal to zero and so that the term $(1-C_t^{Ar})(1-C_t^{Au})$ is simply equal to $[1-[C_t^{Ar}+C_t^{Au}]]$ or $(1-C_t^{T})$. Thus, in the Chilean case the estimated total arbitrage cost was of 8,25%[36]. So, the exit point for silver was 15,03 (16.39*0.9175) and 17,86 for gold (16.39/0.9175). The latter means that every time that the relative international price of gold was below 15,03 the Chilean silver would have been exported and gold should have remained as the only domestic circulating metal determining a *de facto* gold standard under a bimetallic *régime*. In the same fashion, when the international price was above 17,86, the Chilean gold should have been exported and the bimetallic *régime* transformed into a *de*

facto silver standard. Finally, if the international price of bullion was within the bounds, the Chilean economy should effectively have operated under a bimetallic *régime* where both silver and gold circulated domestically. Figure #16 presents the evolution of the gold/silver price at London as well as the bounds we have estimated.

[Insert Figure#16]

Many authors (Llona 2000, Millar 1994, Ross 1886) have argued that until the mid 1870's Chile operated under a *de facto* Gold Standard *régime*. Nevertheless, even if until near 1874 the relative price of gold was close to the silver exit point, we cannot reject the hypothesis that a bimetallic *régime* could have functioned. What is true is that since the end of the 1870's Chile switched to a de facto silver standard since, even taking into account the arbitrage costs, it was profitable to export the Chilean gold Pesos.

Of course, the preceding discussion has implications for the exchange rate. For instance, let us say that the Chilean law of 1851 set a *mint parity* between the gold Peso and the British unit of 45d per Peso. Under a *de facto* gold standard the Chilean exchange rate should be fixed and determined exclusively by the gold countenance of the coins of each country minus gold arbitrage costs. Similar, under a *de facto* silver standard, the exchange rate must have been in function of the relative price of silver minus the silver arbitrage costs. When an effective bimetallic *régime* applied, the exchange rate must be somewhere within an exchange rate band which in turn depended on the bounds we calculated for the gold/silver price. In a more general sense, the exchange rate must have respected the following condition[37].

$$3)\ Max[LP_t^{Au,Ar}(1-C_t^T)F/P*_t^{Au,Ar};(1-C_t^T)F]<S_t^{d,\$}<Min[(F(LP_t^{Au,Ar}/P*_t^{Au,Ar})/(1-C_t^T);F/(1-C_t^T)]$$

Where F corresponds to the 45d fixed parity between the gold Peso and the British currency and $S_t^{d,\$}$ is the exchange rate defined as the amount of pennies per Chilean Peso. In figure #17 we present the evolution of the 3 months exchange rate against the British currency as well as the effective bullion points for the arbitraged exchange rate.

[Insert Figure #17]

As expected, until 1878 the exchange rate stayed almost perfectly within the bounds of the band we have defined. Afterwards, because the international price went peyond the 17,86 limit we have estimated, the gold began to be exported and Chile switched to a *de facto* silver standard. Thus, if convertibility had remained in place, since 1878 the only real determinant of the exchange rate must have been the silver price.

Of course the inconvertibility introduces modifications in our analysis. In this case, noteholders cannot convert their notes in specie, but the best they can do is to expect that some day the convertibility will return. In consequence, under this scenario, it is natural to expect a discount rate or premium of the exchange rate in relation to the implicit metallic (silver) exchange rate that would have existed under a convertibility *régime*. Notice that is exactly what happened since the introduction of inconvertibility in 1878. The obvious question we have to answer now is what role banks played over the evolution of this discount rate.

Let us begin by identifying the factors behind such a discount rate under a scenario in which both banks and the State issue inconvertible notes. In an equilibrium situation one can reasonably assume that this discount premium over the implicit silver parity must be associated with the expected present value of the future conversion. At the same time, we can suppose that this present value expectation depends of three things. First, of the probability that conversion will be carried-out. Second, of the delay over which this conversion will be done (tomorrow? in ten years?). Third, of the expected conversion value (will the note

conversion be carried out at par value? with discount? at which price?). It is difficult to establish which is the exact weight of each of these factors[38]. Nevertheless we can assume that each of them will be influenced by the future conversion capacity. A fall of the latter must be translated either by a diminution of the probability of returning to convertibility, either by an extension of the inconvertibility period (in order to have time to cumulate specie), either by a drop of the expected conversion price (less metallic per note), or by a combination of the three of them. In turns, the future conversion capacity will depend on the amount of notes to be converted and, of course, on effective specie reserves. One can expect that if emission increases without a proportional raise in specie reserves, the payment capacity would be reduced and the discount rate over the pure metallic exchange rate would augment. If we suppose that the excess of depreciation of the exchange rate over the implicit metallic exchange rate can be expressed as a weighted average of both the bank and the State notes that have to be converted and their respectively specie reserves to do it, we can formally describe this reasoning as follows.

$$3)\ (S^m - S^o)_t = f(\Pr, T, r^*, S^T) = f(\alpha[M_t^B - R_t^B] + (1-\alpha)[M_t^E - R_t^E])$$

Where $(S^m - S^o)$ is the difference between the lower bound of the implicit metallic (silver) parity exchange rate (S^m) and the effective nominal exchange rate (S^o). Pr is the probability of conversion, T is the time that has to pass until the conversion, r^* is the opportunity cost (interest rate) and S^T is the conversion rate at time T. M_t is the stock of notes to be converted and R_t are the specie reserves available, α is the share of the bank notes to be converted in relation to the total amount of paper money that has to be converted. Sub-indexes B an E represent respectively the banks and the State.

Before estimating equation (3) let us notice an important element. In addition to specie reserves, the banks also held important amounts of fiscal notes in cash. Because these fiscal notes would be convertible some day, its maintenance operated as if banks would have

cumulated specie reserves in some extra proportion[39]. As a consequence, the conversion capacity of the State closely influenced the one of the banks. However, what is important to notice is that if the convertibility capacity of banks weakens because of a deterioration of the convertibility ratio of the State, the further depreciation that must appear could not be imputable to banks but to the depreciation of the fiscal note. In particular, one can reasonably assume that every time that the banks backing (defined as specie plus the amount of fiscal notes that banks held in cash) was over the amount of their redeemable notes, no exchange rate depreciation can be directly attributed to banks but to a deterioration of the fiscal notes convertibility ratio. In the same way, when the banks backing ratio was below one, one part of the resulting exchange rate depreciation would be imputable to banks in function of the proportion of their uncovered notes. The remaining difference would be attributable to the fiscal emission.

[Insert Figure #18]

In figure #18 presenting the specie and fiscal note backing ratio of the banks in relation to their total emission, three interesting remarks arise. First, during the convertibility period the specie backing of the banking system deteriorated systematically over time. Even if at the eve of 1878 this ratio still remained at reasonable levels (40%), this declining tendency would be the major factor explaining the banking panic that ariose this year and the instauration of the inconvertibility as a way to help the banking system. Second, during the inconvertibility era, the specie backing didn't augment but, at least, it remained stable (near 20%) until the beginnings of the 1890's. If the reasoning we presented in equation 3) is correct, the latter means that during this period new bank emissions should not have entailed a further excessive depreciation of the currency besides from the one that must occurred (as a matter of fact happened) immediately after the instauration of the inconvertibility[40]. Third, and most important, if during the inconvertibility period the specie backing didn't improve, in

compensation the banks cumulated large amounts of fiscal notes in cash reserves allowing them to attain an average total backing ratio of near 85% of their total emission. The latter implies that the banks couldn't have been fully responsible for the excessive depreciation that Chile experienced during the inconvertibility. Figure #19 presents our estimates on the share of the total excessive depreciation which is attributable to the bank and to the fiscal notes.

[Insert Figure #19]

For an average excessive depreciation of near 23% during the inconvertibility period, the banks can only account for 5% and the fiscal notes for the remaining 18%. Moreover, with the exceptions of the immediate depreciation that occurred after the instauration of inconvertibility and the episode at the end of the 1890's when the backing ratio of the banks declined, the major events of excessive depreciation were not related to an increase in bank notes. On the contrary, as figure #20 shows, it seems very clear that these were mainly associated with huge expansions of the fiscal emission.

[Insert Figure #20]

4-Conclusions

We have presented a general overview of the Chilean free-banking experience. Even if this period extended between 1860 and 1898, this study showed that, because of several reasons, this era should be split in two sub-periods. In particular, only the 1860-1878 phase would be fully in line with a rigorous definition of the free-banking concept. This was the only period in which banks, guided by pure market incentives, were the exclusive fully responsible in determining the supply of fiduciary money. It also was the unique extensive period in which banks functioned under convertibility. Since 1878 and the subsequent instauration of inconvertibility, the Chilean free-banking system lost much of its competitive characteristics. For instance, even if free entry to the market was granted and banks continued to have the right to issue money, the State rapidly became the major paper money supplier and

its notes substituted to a large extent the banking emission. During this « double issuer » period Chile experienced a dramatic depreciation of its exchange rate as well as some inflationist episodes. As we have showed, it was precisely an excessive fiscal emission, not a banking one, the factor behind these macroeconomic disequilibria. This period distinction is also applicable if one focuses on the microeconomic aspects of the banking industry. The evidence we presented suggests that competition among banks was larger during the 1860-1878 phase. Along this period, concentration indexes tended to decline, banking interest rate spreads were lower and individual banking « excessive » profitability reduced,. Afterwards, this situation reversed. More precisely, the introduction of inconvertibility and the apparition of fiscal notes seemed to have operated as a shield against an increase in banking competition, even if new banks entered to the market.

Despite these distinctions and considered as a whole, the 1860-1898 free-banking period offers a positive balance. During these years Chile experienced a good economic performance as well as an important development of its capital market. However, important deficiencies inside the banking system remain to be explained and two sets of questions have to be answered. First, if one agrees in saying that 1878 stated a break point, one must also be able to explain the causes behind it. It seems very clear that the inconvertibility did not obey to a caprice of the Government, but to real liquidity problems of some banks. Thus, the relevant element is to determine the part of responsibility of these banks in the process. In so doing, various questions arise. Was this crisis unavoidable in spite of the liberalism of the 1860's banking law? Did these liquidity problems obey to an exogenous shock or simply to a poor banking management? If the latter was the case, wouldn't it have been better to let unsound banks go bankrupt? Second, we have to explain why the inconvertibility period extended for so long (almost 20 years!). If inconvertibility was a transitory mean to save the banking system at a precise moment, one could have expected a return to « normal »

conditions (convertibility) as soon as possible. What are the reasons of this excessive prolongation? Why did the State become the principal supplier of inconvertible money at the same time that it seemed to agree in maintaining inconvertibility for all this time? Did banks benefit from a strong political influence allowing them to perpetuate a system that benefited them? Did unsound managerial procedures impede the banking system to afford an earlier return to convertibility? If yes, what was the incentive role of the law, if any, behind this kind of behavior?

Even if the article we have presented gives us a first overall picture of the Chilean free-banking period, the answers of the aforementioned questions are well beyond its original ambition. This is why we will treat these topics in more detail in an extension of this research.

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[1] For example, Steve H. Hanke « Argentine Endgame: Couple Dollarization with Free Banking », Dec. 2001 or Randall Kroszner, « Free Banking: The Scottish Experience as a Model for Emerging Economies », Nov. 1995

[2] Schuler 1992

[3] For the Scottish case see for example : *Kroszner 1995, Dow & Smithin 1992 ; White 1984, Munn 1975, Checkland 1975*.

[4] For example, *Rockoff 1974, 1989 ; Khan 1985 ; Rolnick 1984, 1985 ; Rolnick & Weber1983, Dwyer Jr. 1996*

[5] For instance, Schuler 1992 (Canada) ; Sandberg 1978, Jonung 1989 (Sweden) ; Neldner 1998, Weber (Switzerland).

[6] More precisely we should speak about a plurality note issuing system and not exactly a "free banking" one. In fact, before starting their businesses banks had to be chartered by the government and, depending on circumstances, by Congress.

[7] Notice that the law didn't commit banks to hold a certain specie backing ratio. We will come back to this point later.

[8] As quoted by the time observer Nicomedes Ossa, in practice this bank carried out non authorized note issuing. ("Ligeros Apuntes sobre el establecimiento y desarrollo de los bancos de emision en Chile" Revista Economica #8, diciembre 1887, p.11).

[9] Hired in 1855 by the Chilean Government as Professor of Political Economy at the Universidad de Chile as well as consultant of the Finance Minister.

[10] « La quantité de monnaie employée dans un pays est réglée uniquement par les besoins du commerce et ne peut s'élever au dessus de la somme requise par ces besoins , sans qu'il y ait aussitôt une dépréciation de billets de banque au dessous de la monnaie métallique occasionne une demande immédiate de remboursement qui modère les émissions » (« Traité de théorie politique et pratique des opérations de banque » Paris, 1876, p 401.)

[11] For example, for the U.S. free banking experience, in Indiana and New York States note issuing could not go beyond the 12,5% of the specie reserves (quoted in Rolnick and Weber 1984, p.269, table 1)

[12] This provision was in line with the aforementioned Courcelle-Seneuil's economic thought.

[13] As we aforementioned, the 1860's law forced banks to send to the Finance Minister monthly balance of their financial situation.

[14] Let us also notice that because inconvertibility was a way to prevent possible bank failures, ideally one should include the cases of failure that would have occurred in the absence of this provision. Unfortunately, we are avoided to know exactly what would have happened in this case. This is the reason why we are concerned exclusively with the effective cases of failure.

[15] Table 2, p.1085.

[16] The 0,18% was estimated using the data presented by King (1983) in table 1, p 146.

[17] In opposition to some other States where free banking didn't perform very well, the case of the state of New York State is often quoted as a successful example.
[18] The story is that bankers supposedly established unsound banks in inaccessible locations of the U.S. (where wildcats roamed) because it was more difficult for a noteholder to ask the redemption of his notes (quoted in Dwyer Jr. 1996). In a more general sense the concept points out that because of informational asymmetries, some banks will issue notes without any solvent guarantee, exchange them in town for some noteholder assets, close the bank as soon as possible and run with the noteholder money.
[19] Later, Rolnick and Weber 1984 have rebated this point. Nevertheless, we retain the concept of Wildcat banking.
[20] In the Chilean case all banks were established in the most populated towns. Most important banks were installed in financial centers of Valparaiso and Santiago and had branches in the most important cities in the rest of the country. "Peripheral" banks such as the one we reported as having failed were installed in important cities such as Concepcion, San Fernando, Chillan, Osorno, Valdivia, Copiapo or Antofagasta.
[21] More precisely the index adds the square of the market shares of each single bank. Because market shares are by definition between zero and one, by this means the index gives a more heavy weight to the biggest banks and vice-versa. In a highly competitive environment with (N) banks having similar market shares, the index takes a value of 1/N (value which tend to zero). On the contrary, with a single firm (this is the extreme case for a fully concentrated industry) the index takes a value of one. Thus, the closer the index is to one, the more concentrated the industry is.
[22] These are the criteria used by the U.S. Department of Justice and the Federal Trade Commission.
[23] In any case, with the 28 banks operating today in the highly dynamic and competitive Chilean banking system, the five major banks concentrate near 60% of the total deposits.
[24] The latter could, as we have seen, partially explain why banking failures were rare.
[25] In 1893 these two banks (and Banco Agricola) merged into the Banco de Chile. Notice that this merger could be explained precisely by the profitability decline that each bank experienced at the eve of the gold standard convertibility.
[26] For instance, all other things equal, in a more competitive market spread must be lower.
[27] As measured by the 90 day's lending interest rate.
[28] This measure is known as Financial Intermediation Ratio (FIR). As a proxy of the total financial assets we added the monetary values of the bank deposits, of the stock market capitalization, of the stock of mortgage bonds and of the stock of the domestic public debt.
[29] Imagine we have only three banks A, B and C. The net emission of each bank is, let say, $10, $6 and $3 respectively. For simplicity suppose that only bank C has « other bank notes » for an amount of $5 in its asset side but it doesn't provide details on whether they are notes from bank A or B. In this context it is impossible to individually determine the stock of notes of banks A and B that are « outside » the banking system. The only thing we can say is that people hold $6 in notes of bank C and $8 in combined notes of bank A and B.
[30] To compute the amount of fiscal notes in the hands of the public we proceed as follows : From the total stock of fiscal notes we deducted the stock of fiscal notes deposited at the Treasury (and so, out of circulation) and the amount detained by the banking system because, for practical purposes, they were also outside of the hands of the public.
[31] Even more, one can think that the fiscal note was more preferred among notheholders since it could be seen as a more reliable kind of paper money.
[32] The GDP index was obtained from Braun, Briones et al. (2000). The price index has been calculated by Lüders, Jeftanovic and Paglia (2000) based on a homogenous basket of consumer goods and is presented in Braun, Briones et al. (2000). Methodological details on inflation estimates can be found in Jeftanovic, P., Jofré, J., Lüders, R. and Paglia, M., (2000).
[33] This anchor could have functioned only if specie conversion was granted or at least was credible.
[34] Flandreau, 1996, p. 878, quoting Seyd , E. « Bullion and Exchange Rates » London, 1869.
[35] For a domestic arbitrageur, we assume a 2 month opportunity cost at an annual nominal interest rate of 9%.
[36] 3,5% (silver direct cost) plus 3.25% (gold direct cost) plus the opportunity cost (1,5%).
[37] For a more detailed discussion as well as for the case of countries in which specie export/imports affect the world's bullion prices, see Flandreau 1996b
[38] Of course these three variables are interconnected.
[39] Of course, because the inconvertible fiscal notes had also a risk of conversion, their value in terms of specie reserve was not one by one but less.
[40] This could be a simplification of what actually happened. In fact, one can think that people had formed their expectations on the return to convertibility based in an improvement of the banks backing ratio. Since this ratio did not improve along time (although it remained stable), people could simply have discounted more and more the banking note and thus the exchange rate.

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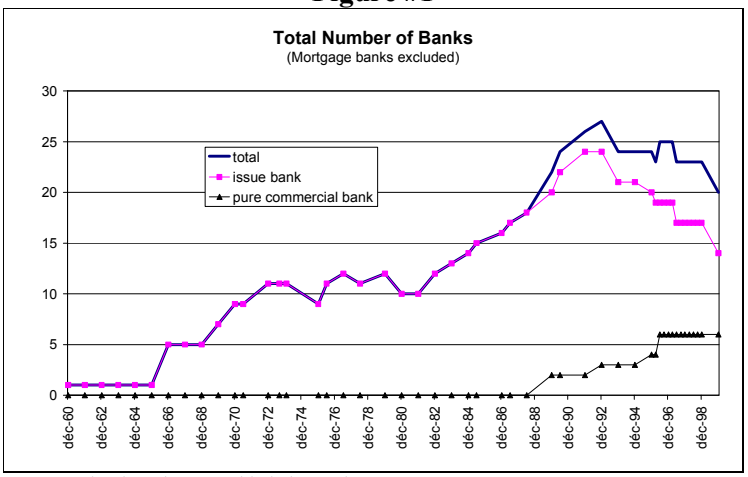
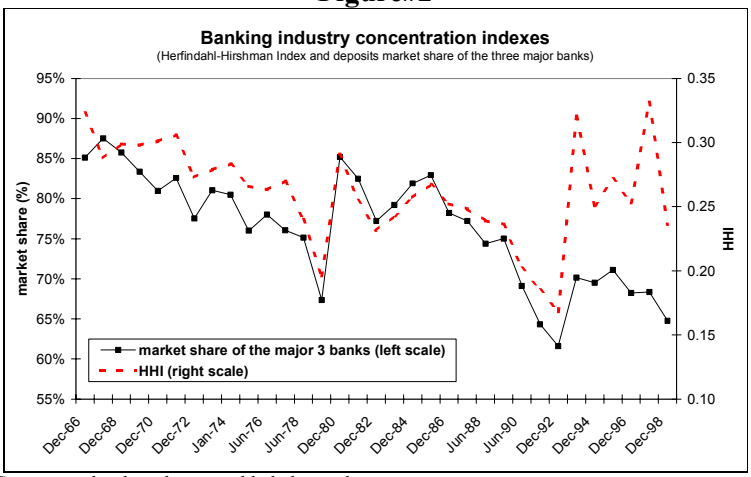
FIGURES and TABLES

Figure #1



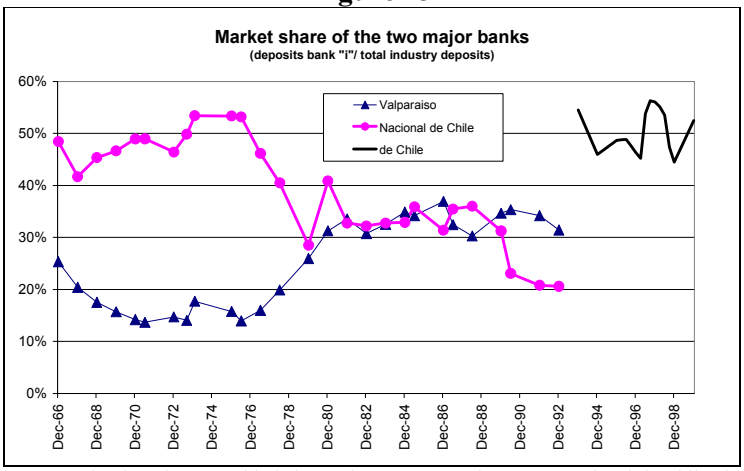
Source : author based on monthly balance sheets.

Figure#2



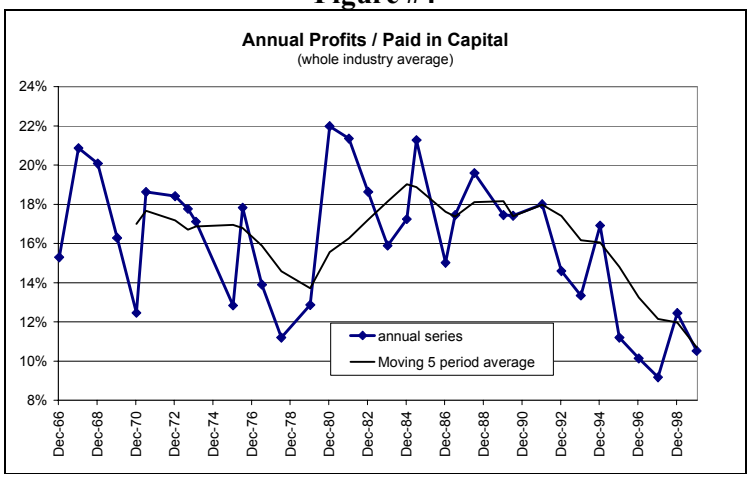
Source : author based on monthly balance sheets.

Figure #3



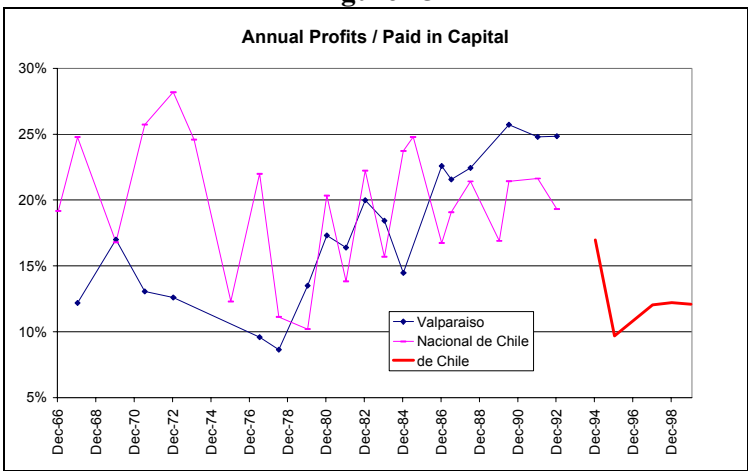
Source : author based on monthly balance sheets. In 1892 the Banco Nacional de Chile, the Banco de Valparaiso and the little Banco Agricola merged creating the so called Banco de Chile.

Figure #4



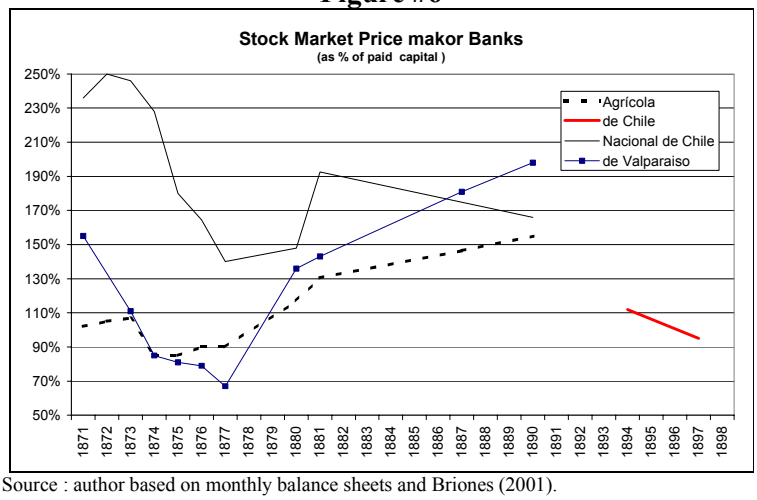
Source : author based on monthly balance sheets.

Figure #5



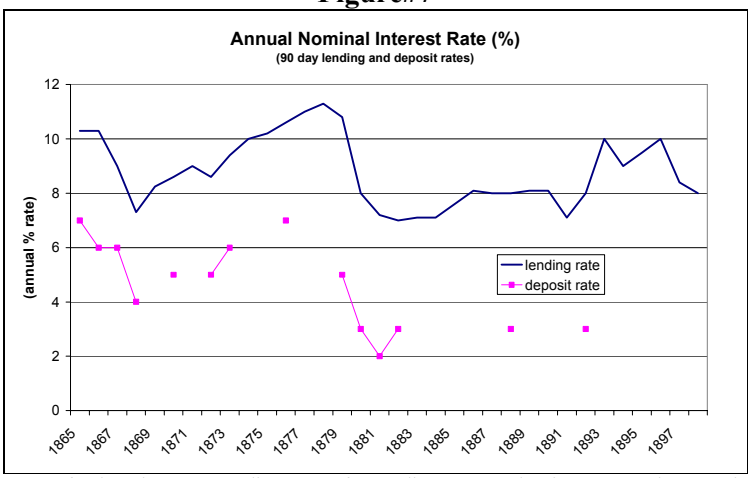
Source : author based on monthly balance sheets.

Figure #6



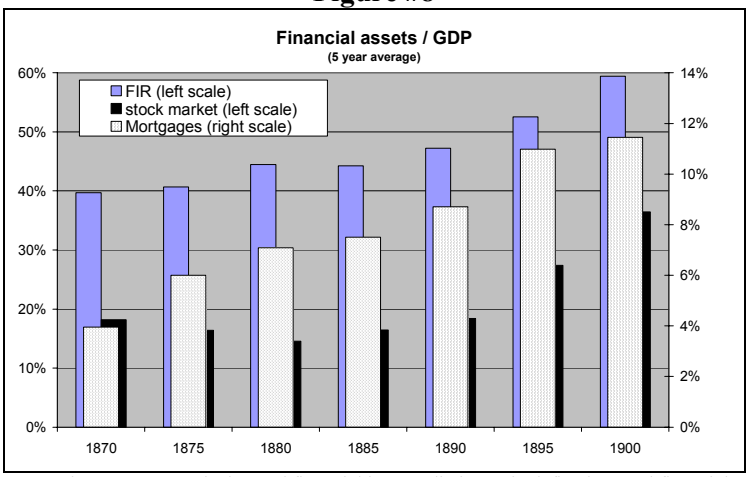
Source : author based on monthly balance sheets and Briones (2001).

Figure#7



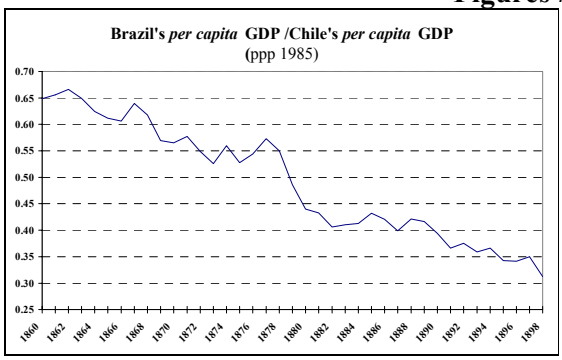
Source: for deposit rates: Santelices 1893; for Lending rates: Lüders in Braun, Briones et al. 2000.

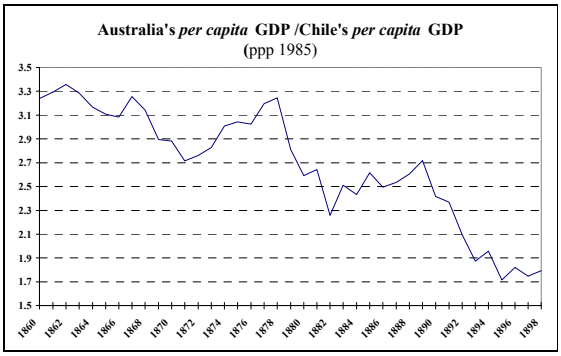
Figure #8

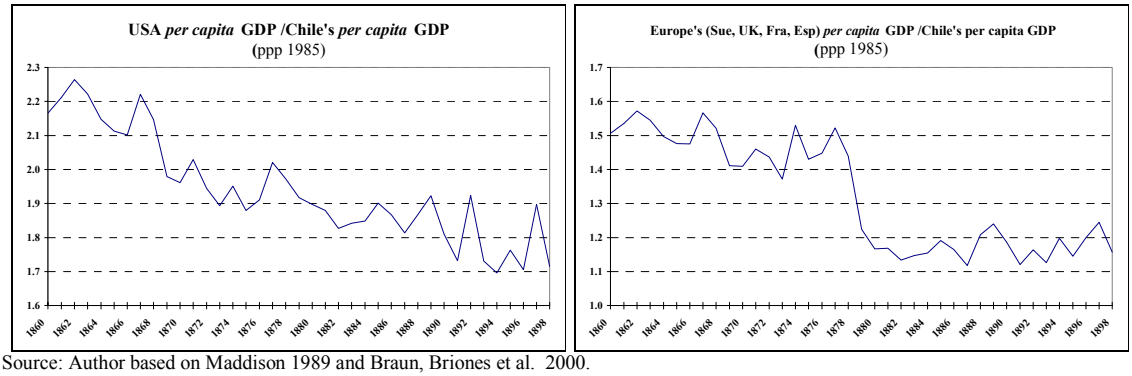


Source: Briones 2001. FIR is the total financial intermediation ratio defined as total financial assets to GDP

Figures #9 to #12

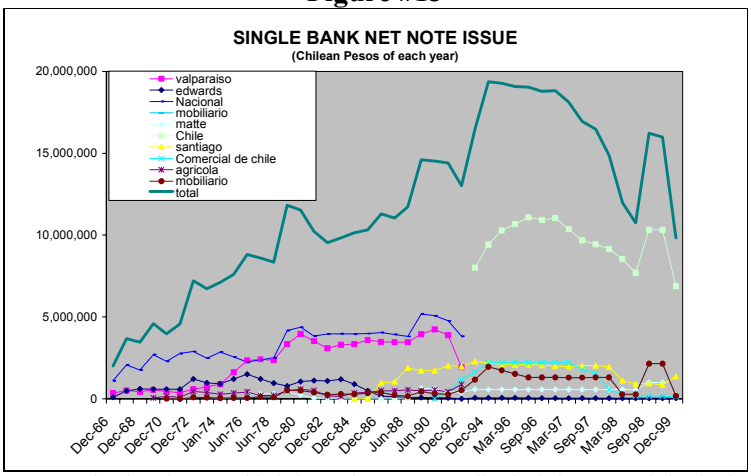






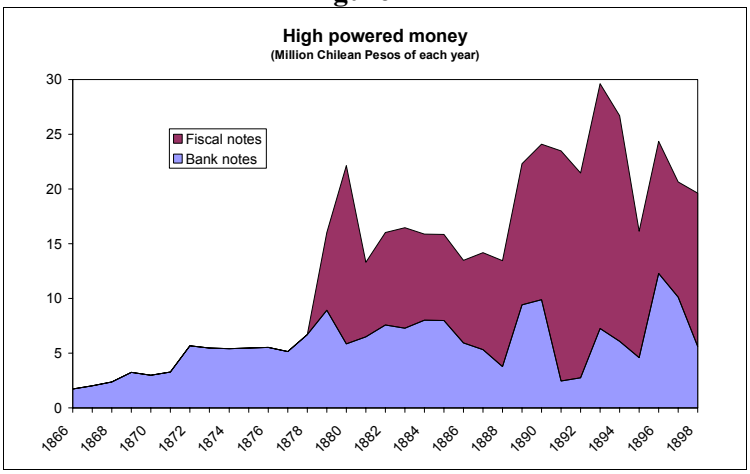
Source: Author based on Maddison 1989 and Braun, Briones et al. 2000.

Figure #13



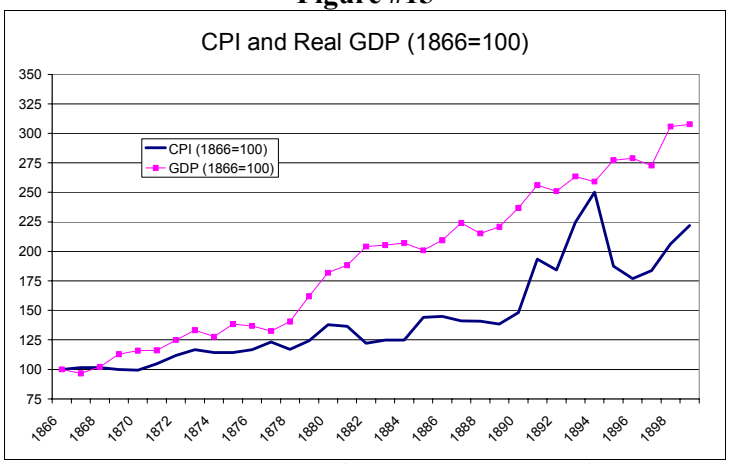
Source : author based on monthly balance sheets. TOTAL line includes ALL existing banks and not only the ones presented in the figure

Figure #14



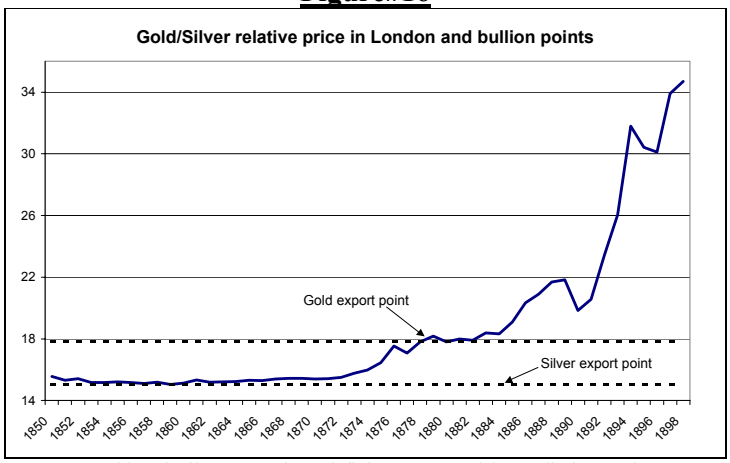
Source : author based on monthly balance sheets.

Figure #15



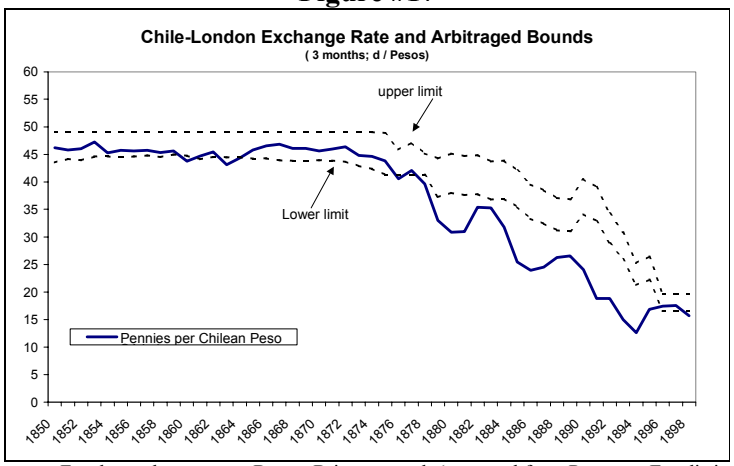
Source : Braun,J.; Braun, M.;Díaz, J.;Luders, R. y Wagner, G.& Briones. "Economía Chilena 1810-1995: Estadísticas Históricas". Instituto de Economía Pontificia Universidad Católica de Chile, Documento de Trabajo No. 187.

Figure#16



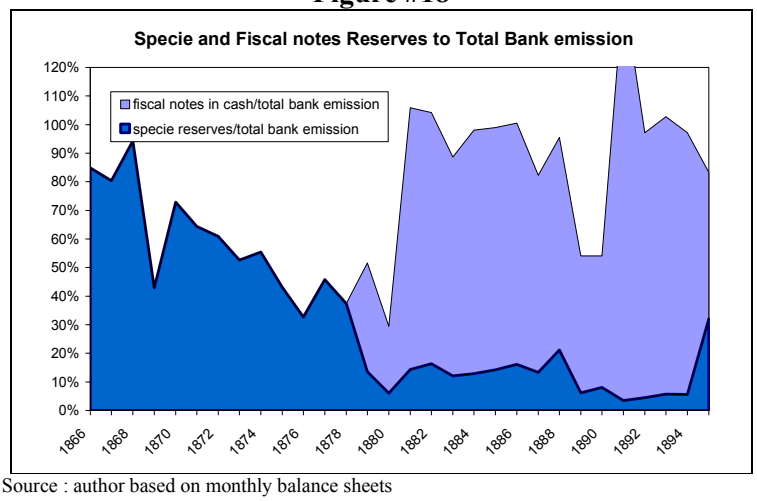
Source: For Gold and Silver quotations defining upper and lower limits: Währungen Der Wel I p. 288-294 et Flandreau, « l'Or du Monde ». Also NBER Macroeconomic Database, Series 04018

Figure #17



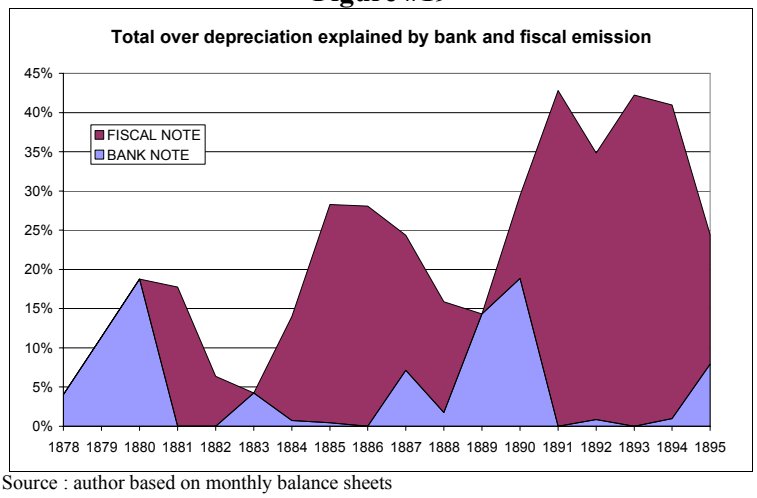
Source : For the exchange rate : Braun, Briones et . al. (extracted from Resumen Estadistico de la Hacienda Publica, 1901). For Gold and Silver quotations defining upper and lower limits: Währungen Der Wel I p. 288-294 and Flandreau, « l'Or du Monde ». Also NBER Macroeconomic Database, Series 04018

Figure #18



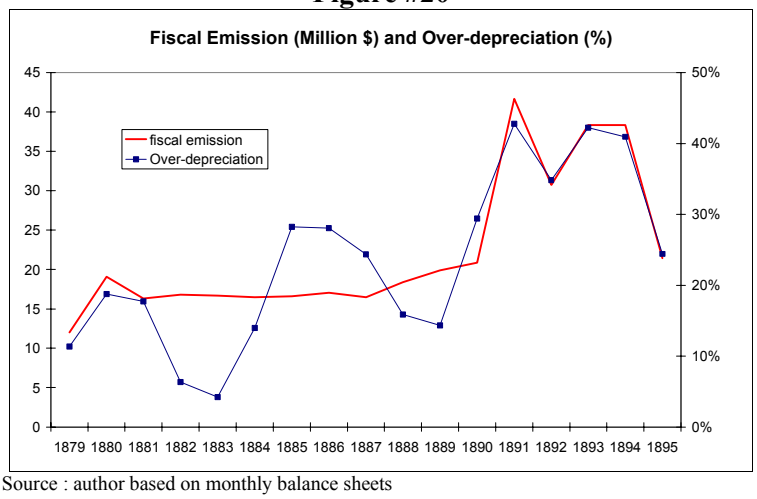
Source : author based on monthly balance sheets

Figure #19



Source : author based on monthly balance sheets

Figure #20



Source : author based on monthly balance sheets

Table #1
Note issuing-banks existing in Chile (1860-98)

	Name	Foundation	First note issue	Closing date (1)	Duration (in years) (1)
1	**Nacional de Chile**	22 march 1860*	Dec-60	Dec-92	32
2	**Mac-Clure y Cia***	1854**	Dec-66	Jun-71	5
3	**Ossa y Cia**	1856	Dec-66	Dec-83	17
4	**Valparaiso**	30 June 1857	Dec-66	Dec-92	26
5	**Edwards y Cia**	5 January 1867	Feb-67		
6	**Agricola**	13 January 1869	Dec-69	Dec-92	23
7	**Montenegro y Cia**	10 august 1869	Dec-69	Jan-74	4
8	**del Sur**	9 may 1870	Dec-70	Jun-71	1
9	**Mobiliario**	16 February 1870	Dec-70		
10	**Alianza**	1 October 1872	Dec-72	Dec-79	7
11	**Concepcion**	3 October 1871	Dec-72		
12	**Matte-Mac-Clure y Cia***	1872	Dec-72	Jan-74	1
13	**Sud Americano**	1872	Dec-72	Aug-73	1
14	**del Pobre**	?	Jan-74	Jun-77	3
15	**de la Union**	29 October 1874	Jun-76	Mar-97	21
16	**Matte y Cia***	1876	Jun-76		
17	**Consolidado**	?	Jun-77	Dec-79	3
18	**de Melipilla**	3 January 1879	Dec-80		
19	**de José Bunster**	1 September 1882	Dec-82		
20	**de Curico**	16 January 1882	Dec-83		
21	**de Tacna**	1885	Dec-84		
22	**de Caupolican**	15 January 1883	Jun-85	Dec-92	8
23	**de Talca**	2 July 1885	Jun-85		
24	**de San Fernando**	12 October 1884	Dec-86	Dec-95	9
25	**de Santiago**	20 November 1884	Dec-86		
28	**de Crédito Unido**	10 august 1888	Dec-89	Mar-97	7
26	**de Llanquihue**	15 February 1888	Dec-89		
27	**del Nuble**	25 February 1887	Dec-89		
29	**Comercial de Chile**	?	Dec-91		
30	**de Ahorros y Prestamos**	?	Dec-91	Dec-94	3
31	**de Arauco**	?	Dec-91		
32	**de Rere**	1889	Dec-92		
33	**de Chile**	16 September 1893	Dec-93		
34	**de la Serena**	1891	Dec-93		

Source: author based on monthly balance sheets. (1) A blank indicates that the bank was still functioning by December 1898
* These three banks were in fact the same: there was only a name modification. ** Former bank Bezanilla and Mac-Clure founded in 1854

Table #2
Closed Banks 1860-1898

	# Banks	% of Total number of banks
# CLOSED BANKS	**17**	**50%**
Non associated to failure	**7**	**20,5%**
Name change	2	6%
Merger/Acquisition	4	12%
Pure Closing/notes redeemed (case 1)	1	3%
Associated with failure	**10**	**29,5%**
Liabilities acquired (case 2)	3	9%
Notes not redeemed (case3)*	7	20,5%
# TOTAL BANKS	**34**	**100%**

Source: Author based on year-to-year balance sheets
* It is the maximum number of cases in which notes would not have been fully redeemed.

Table #3
Potential noteholders and depositors lost of failed banks

	Bank	Closing date	Duration (Years)	Stock of notes (As % total notes in circulation)	Deposits (As % of total deposits)
1	del Sur	Jun-71	1	0,91%	0,4%
2	Montenegro y Cia	Jan-74	4	0,89%	0,1%
3	del Pobre	Jun-77	3	0,82%	0,9%
4	de Caupolican	Dec-92	8	1,04%	0,1%
5	de Ahorros y Prestamos	Dec-94	3	1,20%	0,3%
6	de San Fernando	Dec-95	9	0,87%	0,6%
7	de la Union	Mar-97	21	0,81%	1,1%
	Annual weighted Average loss rate (1860-1898)			**0,25%**	**0,12%**

Source : Author based on year-to-year balance sheets

Table #4
Real per capita GDP average annual growth rate

1860-1898	2,1%
1898-1925	1,1%
1925-1975	0,6%
1975-1995	3,9%

Source : Braun,J.; Braun, M; Briones,I.;Díaz, J.;Luders, R. y Wagner, G. "Economía Chilena 1810 1995: Estadísticas Históricas". Instituto de Economía Pontificia Universidad Católica de Chile, Documento de Trabajo No. 187.