

CHILEAN MONETARY HISTORY, 1860-1925 AN OVERVIEW *

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ABSTRACT

Monetary policy has been one of the least understood and much debated topics in Chilean economic history. An ideological commitment to convertibility has alienated economic historian from the larger subject of costs and benefits of the exchange regime. This paper studies the process of money creation in Chile and its relationship with banking regulation. Given the characteristics of the Chilean economy, the author concludes that adherence to the gold standard was not possible and that Chilean naive experiments with the real bills doctrine provided the economy with financial stability.

SUMARIO

La política monetaria ha sido uno de los tópicos menos comprendidos y más debatidos de la historia económica chilena. La aceptación incondicional de la convertibilidad ha alienado a los historiadores económicos de un debate más amplio respecto de los costes y beneficios de los regímenes cambiarios. Este ensayo estudia el proceso de creación de dinero en Chile y su relación con las regulaciones al funcionamiento de los bancos. Dadas las características de la economía chilena, se concluye que la adopción del patrón oro no era posible y que los experimentos chilenos con la doctrina de los real bills permitió alcanzar cierta estabilidad financiera.

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1. INTRODUCTION

Monetary policy is one of the least understood topics in Chilean economic history; although its likely impact has been much debated. The historical debate concentrates only on a narrow monetary aggregate: the amount of fiscal notes in circulation and lacks a clear understanding of the monetary transmission mechanism as well as the functioning of commercial banks as money creators. An ideological commitment to convertibility has alienated economic historians from the larger subject of the costs and benefits of different monetary and exchange rate regimes, thus creating the impression that monetary policy was one of the country's big failures during this period.

The aim of this paper is to give a general view of Chilean monetary history during the XIXth century and the first quarter of the XXth century. This paper studies the evolution of different monetary aggregates —monetary base, money supply and credit— as a result of relationship between policy makers and the banking community. It also studies the relationship between the monetary aggregates and the general price level, the domestic interest rate, the spread between the latter and the international one and the exchange rate.

There are few recent works on Chilean monetary history: Lueders (1968), *A Monetary History of Chile: 1925-1958*, and Zahler et al. (1979), *Estadísticas Monetarias de Chile: 1940-1975*, do not include the period covered by this paper. Among contemporary histories, the most interesting are Subercaseaux (1922) *Monetary and Banking Policy of Chile*, Fetter (1931) *Monetary Inflation in Chile* and Santelices (1900) *Bancos de Emisión*. These works share three deficiencies: (1) a narrow definition of money, which includes only fiduciary currency in circulation, (2) a view of the money market in isolation that does not allow to see the difference between open market operations and deficit financing and (3) a difficulty in seeing banks as financial intermediaries trying to set their portfolio so as to maximize profits, thus implying the lowest possible reserve ratio.

The paper has six chronologically organized sections and a final section with conclusions. The second section describes monetary developments until 1878. The third section studies the period 1879/80 until 1894. The fourth section describes the ill-fated return to convertibility of 1895. The fifth section deals with the policies adopted from 1898 until 1908. The sixth section runs from 1909 until 1925. The final section sums up the conclusions of the paper.

2. THE GOLDEN PESO: 1818-1878

Chile inherited from Spain the colonial bi-metallic standard; after Independence in 1818, the Mint continued coining silver and gold pesos according to colonial weights. Monetary Laws of 1832 and 1834 established the metallic content of the silver peso in 24.43 grams of fine silver and that of the gold peso in 1.48 grams of fine gold, implying a ratio of 1:16.51; however, in Europe the same ratio was 1:15.72. In other words, the Chilean Mint undervalued silver with respect to Europe; consequently, silver coins were driven out of circulation. Monetary Laws of 1851 and 1860 slightly reduced the metallic content of the silver peso to 22.5 grams of fine metal and that of gold to 1.3725 grams of fine metal. The new price of gold was 1:16.39, still below the market rate: 1:15.25 at the time. The par exchange rate between the Chilean gold peso and the pound sterling was 5.335 pesos or forty-five pence. Although there are detailed statistics on the activity of the Mint since colonial times, the stock of coins in circulation is unknown; since 1844 it is possible to calculate changes in the stock of coins because there are figures on coinage as well as imports and exports of numeraire, unfortunately coin exports were taxed, therefore the available figures are not reliable.

Banks did not operate until the 1850s and those established then, did not have the right to issue notes. However, the economy's rapid development raised the demand for money: contemporary businessmen claimed that the lack of fiduciary currency was a major hindrance for the country's further development. They argued that metallic currency did not have sufficient elasticity to accommodate the growing financial needs of the economy. After much discussion, on July 1860, Congress passed a bill authorizing the establishment of banks of issue. According to the law, banks could issue notes up to 150 percent of their paid-in-capital and reserves, notes were redeemable on demand in gold or silver currency, otherwise they became executive orders against the bank's assets and the personal wealth of stockholders. Note issue had to be registered at the Mint and banks had to submit monthly balances to the Ministry of Finance. This law established a system of competitive banks of issue, leaving note backing and the deposit-reserve ratio to the banks' management. These liberal provisions need to be considered along with the high cost of insolvency for the stockholders, derived from unlimited liability.

After the passage of the law, banks of issue multiplied in number and the volume of their operations soared; particularly since 1866, as shown in Table I. This extraordinary development came about as a consequence of two fortuitous events: (1) the war with Spain in 1866 and (2) the discovery of the rich silver mine of Caracoles in 1870. To finance the extraordinary expenses gener-

ated by the war, the government secured a loan from a syndicate of domestic banks; one of the loan's condition was the government's acceptance of notes issued by the participating banks in payment of taxes and dues. From 1860 to 1866, the government had been adamant in demanding specie for these payments, by accepting bank notes paper currency became *de facto* legal tender ¹. Consequently, the public substituted the more convenient paper notes for coins; banks were eager to satisfy this exogenous increase of the demand for paper currency. Table I shows that from 1865 to 1870 bank notes multiplied 2.86 times and deposits 8.34.

TABLE I
Expansion of Commercial Banking: 1861-1878.
(Thousand of Current Pesos, Balances at December 31)

Year	Assets		Liabilities			Specie Reserve Ratio	
	Specie Reserve	Loans	Deposits	Bank Notes	Net Worth	Specie/Bank Notes	Specie/Bk. Notes+ Deposits
1861	1,377	4,954	2,745	136	2,080	10.125	.477
1862	561	4,464	2,589	268	1,037	2.093	.196
1863	1,129	5,097	2,567	259	1,040	4.359	.400
1864	745	5,484	2,816	214	1,046	3.481	.246
1865	596	6,788	2,482	1,538	899	.388	.148
1866	4,447	8,104	9,496	2,372	3,472	1.874	.375
1867	3,122	15,178	15,849	3,674	4,483	.850	.160
1868	3,312	21,402	19,163	3,923	5,452	.844	.143
1869	2,104	28,185	21,492	4,635	6,256	.454	.081
1870	2,421	26,648	20,691	4,400	8,068	.550	.096
1871	n.a.	n.a.	n.a.	n.a.	n.a.		
1872	4,656	48,092	37,672	7,157	12,810	.651	.104
1873	4,424	55,837	41,887	7,617	18,251	.581	.089
1874	5,148	50,804	36,714	7,375	18,483	.698	.117
1875	4,785	53,946	38,325	8,632	19,617	.554	.102
1876	3,645	56,401	38,686	8,991	22,136	.405	.076
1877	4,639	59,051	41,202	8,154	20,634	.596	.094
1878	3,449	56,383	37,173	8,349	20,610	.413	.076

SOURCE: A. Llona, *Chilean Monetary Policy: 1860-1925*, Appendix C.

¹ By *de facto* legal tender we mean that there was no law forcing the use of paper currency. In the course of the next four years the government began to accept notes issued by any bank.

The boom provoked by the discovery of Caracoles was without precedents in the Chilean economy, historians describe the years 1870 to 1875 as a period of frenzy speculation. Figures in Table I do not contradict them: credit multiplied 2 times, deposits 1.9 and bank notes 2 times during those six years.

This extraordinary growth of banking activities was on shaky grounds. A monetary system with convertible currency and without a central bank requires banks of issue to keep an appropriate level of bullion reserves ready to fence off panics and crises. Here, however, the ratio of specie holdings to bank notes and that of specie holdings to bank notes plus deposits fell continuously from 1861 up to the first semester of 1878. The share of specie holdings in total assets fell continuously: the average for the period 1861-1868 was 16.1 percent, that for the period 1869 to 1877 was 7.5 percent, and it was only 5 percent in the first semester of 1878. This low level of specie reserves made Chilean banks particularly vulnerable to external crises. Balance of Payments problems were bound to turn into financial crises as happened in the late 1870s.

Table II shows the path to the crisis of 1878. The price of exports reached its second highest level for the period in 1872 and although falling, the level for the next two years was above the average of the pre 1872 period. From there on export prices began a sharp decline, reaching their lowest level in 1878/79. Total exports declined and, as indicated in Table III, the trade balance began to show a deficit. The external shock was compounded by a domestic shock: a string of bad harvests in 1875, 1876 and 1877 provoked an increase in the domestic price level and a reduction of more than forty percent on wheat exports. Table II shows how the real exchange rate appreciated by more than thirty percent from 1874 to 1878, therefore the level of imports rose, aggravating the external imbalance².

The external imbalance was financed by exporting bullion, thus reducing banks' specie holdings. The price-specie-flow mechanism predicts that banks should reduce the money supply, as shown in Table I, Chilean banks reduced the specie reserve ratio. Table III indicates that as the external imbalance loomed, specie was exported but the money supply was not affected, the automatic adjustment mechanism was not working: from 1874 to the first semester of 1878 bank money—notes plus deposits—rose continuously from \$ 41.4 millions to \$ 45.5 while specie reserves fell from \$ 5.1 millions to \$ 3.5 (Table I). By mid 1878 rumors concerning the banks' ability to redeem their notes filled the halls of Santiago and Valparaiso Stock Exchanges: the public began to withdraw their deposits from the

² The domestic price index included in Table II is a proxy for variations in the price of non-traded goods. Although wheat was a traded commodity, transportation costs allowed for a large spread between FOB and CIF prices; in those years, domestic price of wheat rose by more than 30 percent without inducing a flow of imports.

banks and in June 1878 there was a run on the country's largest bank. Banks' reserves were equal to only 7.58 percent of outstanding notes plus deposits and forty-one percent of outstanding notes: they could not face a financial panic.

TABLE II
Exchange Rate and Export Prices: Chile 1860-1878
(Indices based in 1870. Annual averages)

Year	Nominal Exchange Rate \$/£	Domestic Price Index (1)	Export Price Index (2)	Sauerbeck Price Index	Real Exchange Rate (3)	Exports Real Exchange Rate (4)
1860	5.49	n.a.	134.1	103.13	n.a.	n.a.
1861	5.42	91.04	131.3	102.08	115.45	148.61
1862	5.28	96.68	130.5	105.21	109.27	135.49
1863	5.47	93.63	127.7	107.29	119.16	141.83
1864	5.42	81.78	124.9	109.38	137.71	157.37
1865	5.24	71.97	120.8	105.21	145.58	167.21
1866	5.15	71.95	122.4	106.25	144.70	166.56
1867	5.13	92.71	119.9	104.17	109.51	126.13
1868	5.21	106.56	121.3	103.13	95.86	112.75
1869	5.21	92.57	103.1	102.08	109.23	110.32
1870	5.26	100.00	100.0	100.00	100.00	100.00
1871	5.22	102.90	119.3	104.17	100.54	115.06
1872	5.18	111.51	133.2	113.54	100.17	117.63
1873	5.36	109.68	129.4	115.63	107.32	120.22
1874	5.38	109.57	125.1	106.25	99.14	116.78
1875	5.48	123.59	115.8	100.00	84.25	97.62
1876	5.92	122.62	107.1	98.96	90.76	98.30
1877	5.71	137.21	106.2	97.92	77.39	84.02
1878	6.06	143.66	88.3	90.63	72.62	70.81

NOTES:

(1) Domestic price index tries to capture non-traded prices, it includes six products: bran, beans, wheat, corn, flour and one cow.

(2) Exports price index is a Paasche index that includes three commodities: copper, silver and wheat whose share on Chilean exports was above 75 %, prices are those observed in London.

(3) Real exchange rate = (Nominal exchange rate/Domestic price index) * Sauerbeck price index.

(4) Exports real exchange rate = (Nominal exchange rate/Domestic price index) * Exports price index.

SOURCES: (1) Domestic Prices: bran, beans, wheat and corn, from J. M. Mamalakis, *Historical Statistics of Chile*, Vol. 3 pp. 215-219; flour and cow from A. Bauer, *Chilean Rural Society*, p. 234. (2)

Export Prices: Oficina Central de Estadísticas, *Sinopsis Geográfica y Estadística*, 1925, p. 116.

(3) Nominal Exchange Rate: *Sinopsis Geográfica y Estadística*, several issues.

TABLE III
External Imbalance and Change of the Money Supply
(Thousand of Pesos)

Year	Trade Balance (1)	Current Account (2)	Net Specie Trade (3)	Change of Money Supply (4), (5)
1870	- 2,215	- 4,598	- 967	1,181
1871	5,209	2,837	- 141	10,068
1872	3,522	1,148	1,057	n.a.
1873	- 534	- 3,229	- 874	20,009
1874	- 3,370	- 6,626	- 1,451	- 5,835
1875	- 6,647	- 10,184	- 3,404	- 276
1876	- 4,672	- 9,066	- 3,368	815
1877	- 2,952	- 7,171	710	1,033
1878	- 293	- 4,745	- 3,352	- 5,449

NOTES:

- (1) Trade balance does not include specie trade.
 (2) Current account equals the trade balance minus service of government's external debt.
 (3) Difference between imports and exports of specie.
 (4) Change in the money supply equals the change in the stock of coins plus the change in the stock of bank money. Change in the stock of coins equals the balance of specie trade plus coinage by the Mint, bank money equals outstanding bank notes plus deposits.
 (5) We did not have access to commercial banks balances for 1872, therefore the change of the money supply for 1873 was calculated for the years 1871 and 1873.

SOURCE: A. Llona, *Chilean Monetary Policy, 1860-1925*.

«On July 19 [1878], don Melchor Concha y Toro, representing the Board of Directors of the Banco Nacional de Chile, informed President Pinto about the situation of the bank. In a few days its metallic reserve had dropped to 400,000 pesos»³. Faced with the failure of the country's largest commercial bank, the authorities decreed a moratorium and later inconvertibility of bank notes.

Traditionally, it has been argued that the abandonment of convertibility was a major mistake⁴. However, within a system of competitive banks of issue, when a major bank faces a run the reaction of the public and that of the rest of the banks only tends to make matters worse, becoming a run on the financial system. In this case the authorities acted as a *de facto* central bank and lender of last resort and in so doing they prevented even greater evils.

³ Encina (1950), vol. XVI, p. 79.

⁴ Encina (1911), Espinoza (1909), Fetter (1931), Monteón (1982), Pinto (1959), Vial (1981).

3. YEARS OF THE PAPER PESO: 1880-1894

The authorities considered inconvertibility transitory: it was to last only until banks were able to increase their metallic reserves. Accordingly, the government did not issue a single note. The traumatic events of June 1878 prompted the government to reform the Banking Law of 1860 by introducing a guarantee requirement for outstanding bank notes as well as for new issues. This backing was equal to twenty-five per cent of total issue and was to be met by deposits of mortgage bonds, government bonds or bullion with the Treasury. This regulation implicitly established a market regulated mechanism for creating high powered money: whenever banks wanted to increase their note issue by one peso, they had to deposit mortgage bonds worth twenty-five cents at the Treasury. This mechanism does not differ from contemporary open market operations carried out by central banks to control the money supply, except that here there was no central bank. The outcome of this rule under a system of competing banks of issue is to peg the nominal interest rate, with the money supply accommodating to changes in the money demand. Given these conditions, the interest rate is the best indicator of the direction of monetary policy: rising interest rates are sign of contractionary policy, while falling rates suggest expansionary policy; stable interest rates point toward accommodating the money supply to changes in the demand for real cash balances. Given that Chile is a small country, she did not have control over the international interest rate; therefore, the acid test for monetary policy is the evolution of the interest rate differential —spread— between domestic and foreign rates ⁵.

The new regime did not have enough time work before a new shock: by February 1879 winds of war crossed the country and on April 1879, Chile declared war to Peru and Bolivia. The already difficult fiscal situation became more acute. Being unable to secure a new loan from the banks, for the first time in history, the government issued legal tender notes. There were three issues: the first in 1879 for twelve million pesos, the second in 1880 for fourteen million pesos and the third in 1880 for two million pesos.

The rapid increase of the monetary base and of the money stock in 1879 and

⁵ From 1840 to 1928 Chile had easy access to international capital markets: she raised large amount of funds at relatively low cost. The return on Chilean government bonds denominated in convertible currencies —French francs, German marks and British pounds— was lower than the return on Italian government bonds denominated in convertible currencies. Return on Chilean bonds followed the London rates without a clear indication of the market up- or downgrading the country's risk. The spread between the domestic interest rate and the return on Chilean bonds denominated in convertible currencies is the proper test for monetary policy, however, continuous data on the return of those bonds is not available at the moment.

1880 resulted in a reduction of the domestic interest rate and of the spread ⁶. In fact during the war —1879 to 1883— the interest rate and the spread fell while the nominal exchange rate fluctuated around \$ 6.50 per pound and domestic prices stabilized. The new monetary regime proved to be quite stable in face of a war, not a small feat. In 1884 there was a severe external shock: the price of nitrate, now the country's most important export, fell by more than twenty-four percent with respect to the previous three year average. The level of domestic activity dropped and so did the demand for money, but as shown in Table IV, domestic interest rate and the spread varied very little, a sign of the automatic accommodation of the money supply to changes in the money demand. Of course, the price of this kind of stability was nominal and real exchange rate depreciation; however, the change in relative prices shifted production to traded goods and consumption to non-traded goods, helping to close the external gap. It is interesting to note that the crisis of 1884/85 was more severe than that of 1877/78. Had the country been under the gold standard in 1884/85 and with the unreformed Banking Law, the external crisis would have generated the same kind of financial disruption as in 1878.

Although the new regime proved its worth, depreciation of the exchange rate dominated policy makers considerations from 1880 to 1894 (See Table IV). The problem was a difficult one: a trade off between financial stability and price stability. The authorities thought the cause of currency depreciation was the issue of fiscal notes. Consequently, they tried to reduce the circulation of fiscal notes hoping to appreciate the peso. The first conversion law, passed in March 1887, came about as a result of these ideas.

The law required the government to retire and burn monthly installments of \$ 100,000 in fiscal notes, this was to be done until the circulation of fiscal notes had been reduced to eighteen million pesos. Simultaneously, the government had to hoard silver for the redemption of the outstanding fiscal notes. The law also raised the backing for bank notes to fifty percent, however, this guarantee could still be met with mortgage bonds.

The authorities dully fulfilled the provisions of the law. To prompt currency appreciation they also began to accept deposits of fiscal notes at the Treasury. These contractionary measures were almost completely wiped out by the banks.

⁶ Balbach and Burger (1976) define high powered money as «the set of assets that constrains the growth of the money stock», and identify these assets as «those which the consolidated banking sector uses to settle interbank debt and those, aside from bank liabilities which are used as money». Using these concepts, starting 1878 the monetary base is equal to the amount of outstanding fiscal notes, in the hands of the public and the banks, plus twenty five percent of bank notes which was the backing in mortgage bonds.

Table V shows that while the government tried to reduce fiscal notes, the banks increase the amount of bank notes in circulation. Contrary to policy makers expectations, the exchange rate did not appreciate: it remained at a level of \$ 9.55 per pound (see Table IV).

TABLE IV
Monetary Policy Indicators: 1878-1894
(Thousand of Current Pesos, Balances December 31)

Year	Outstanding Notes		High	Nominal	Domestic	Spread	Exchange	Domestic
	Fiscal	Bank	Powered	Money	Interest		Rate	Price
	(1)		Money	Stock	Rate	(4)	\$/£	Index
			(2)	(3)			(5)	(6)
1878	0	9,466	11,833	40,296	10.23	7.08	6.06	143.66
1879	12,000	12,871	15,217	51,011	8.93	5.85	7.27	97.07
1880	19,090	11,795	22,093	79,217	6.80	3.75	7.73	100.60
1881	26,325	9,740	28,760	83,516	6.18	3.18	7.75	108.76
1882	16,810	9,556	19,199	71,136	6.13	3.14	6.78	103.56
1883	16,692	10,065	19,208	72,836	6.35	3.38	7.44	113.68
1884	16,500	10,595	19,148	77,598	6.30	3.33	7.56	147.56
1885	16,622	11,653	19,535	76,546	6.41	3.39	9.43	132.43
1886	17,072	12,280	20,142	78,861	6.48	3.50	10.03	126.47
1887	16,472	12,224	22,584	86,735	6.22	3.27	9.80	140.81
1888	18,400	14,312	25,556	108,307	6.13	3.16	9.14	152.77
1889	19,900	17,629	28,714	118,693	6.24	3.43	9.04	165.34
1890	20,884	19,832	30,799	118,581	6.53	3.86	9.97	159.63
1891	41,693	14,302	51,359	151,134	n.a.	n.a.	12.76	159.44
1892	30,764	15,815	38,671	165,205	6.43	3.78	12.76	170.04
1893	38,361	19,439	42,248	158,541	6.96	4.35	16.00	183.57
1894	38,361	19,146	42,190	161,344	7.66	5.14	19.11	184.62

NOTES:

(1) Outstanding Fiscal Notes are equal to Outstanding Registered Fiscal notes minus deposits of fiscal notes at the Treasury.

(2) High Powered Money or monetary base = Outstanding Fiscal Notes + mortgage bonds deposited at the Treasury equal to 25 percent of Bank Notes until 1886 and to 50 percent from there on.

(3) Money Stock = Outstanding Fiscal Notes + Bank Notes - Bank Reserves in the form of Currency + Deposits.

(4) Measures the difference between yield of Chilean mortgage bonds and British consols.

(5) Annual average.

(6) Same as in Table II with 1870 equal to 100.

SOURCES: Monetary and interest rate series: A. Llona, *Chilean Monetary Policy*, Appendix C; exchange rate series: E. Molina, *Bosquejo Histórico de la Hacienda Pública de Chile desde la Independencia hasta la Fecha*, p. 19.

TABLE V

Fiscal and Bank Notes Counterpoint, 1886-1890
(Thousand of Current Pesos, Balances December 31)

Year	Fiscal Notes		Bank Notes	
	Outstanding	Deposits at Treasury	Actual Circulation	Actual Circulation
1886	26,088	9,015	17,072	12,280
1887	24,888	8,415	16,472	12,224
1888	23,688	5,288	18,400	14,312
1889	22,488	2,488	19,900	17,629
1890	20,884	0	20,884	19,832

SOURCE: A. Llona, *Chilean Monetary Policy*, p. 179.

On January 1891, a mounting institutional conflict between the President and Congress led to a Civil War. From a monetary standpoint, the effect of the war was an explosion of the monetary base: it rose by more than sixty percent while the money supply rose by twenty-seven percent. The exchange rate depreciated accordingly: it dropped from an average of \$ 9.55 per pound from 1885 to 1890 to \$ 12.76 in 1891.

The new administration inaugurated in October 1891 retired more than ten million pesos from circulation during 1892 and passed a second conversion law. The law's main provisions were (1) the establishment of a new currency unit: the peso of twenty-four pence, i.e., ten pesos per pound, (2) the incineration of one third of outstanding registered fiscal notes, (3) the return to convertibility by December 1895: on that date fiscal notes were to be redeemed in silver peso coins of twenty-five grams or a new gold coin worth twenty-four pence, and (4) the establishment of a bullion reserve requirement of twenty percent on bank note issue. The combined effect of these two measures provoke a serious monetary contraction during the first quarter of 1893. The government response was to issue 7.8 million pesos and to pass a third conversion law that postponed resumption until June 1896 but kept all the other provisions of the previous law.

The combined effect of these two conversion laws was a decline in the stock of credit, deposits and the money supply. Banks met the bullion reserve requirement by liquidating credit instead of increasing their net worth, which were the authorities' expectations. Nominal and real money stock were lower in 1893 and 1894 than in 1892, consequently the domestic interest rate rose as did the spread (see

Table IV). All these added to the resumption at a higher rate than the market exchange rate should have produced currency appreciation, but on the contrary, there was currency depreciation: the peso fell by fifty percent from 1892 to 1893, it recovered by a mere nine percent in 1894. A game theoretical explanation suggests that the government's threat of returning to convertibility on a future date —three years ahead— with a distorted parity between silver and gold and at a higher than the market exchange rate was not credible, the public worried by the issue of Treasury Notes in 1893 tried to hedge against a depreciation —instead of appreciation— thus effectively depreciated the exchange rate.

There is an additional hypothesis for the depreciation. The price of silver fell by almost forty percent from 1892 to 1894. The price of silver is crucial because the government did not say in which metal resumption was going to take place, the public, perhaps correctly, assumed that it was going to happen in silver, the lesser expensive alternative for the government, therefore the peso had to fall with silver.

4. PARADISE RECOVERED: GOLD STANDARD IN ACTION, 1895-1898

In February 1895, after three years in office and a great deal of maneuvering, President Montt put together a coalition with enough support in Congress to pass a definitive conversion law. It set a new parity of 13.33 pesos per pound or eighteen pence per peso as of June 1, 1895, date in which the government was to begin redeeming the outstanding fiscal notes. The law required banks to fully back their notes with bullion deposited at the Mint, however, until 1897 banks could fulfill this requirement by depositing fiscal notes, government bonds, mortgage bonds or municipal bonds. The law also set a limit to the amount of total bank notes at twenty-four million pesos, effectively rescinding the banks' right to issue notes because by the time the amount of outstanding bank notes was 21.4 million pesos. Congress authorized the President to sell nitrate fields for financing the operation.

This conversion scheme altered the monetary system in fundamental ways. The retirement of fiscal notes made it similar to the pre —1878 system, the main difference being the 100 percent bullion backing for bank notes and the fact that the amount of bank notes in circulation was fixed. The creation of high powered money was under neither government or bank control; it depended, as in the pre—1878 period, on the economy's external balance. Also it should be noted that this time the authorities explicitly introduced a mono-metallic standard based in gold.

Simply passing a law does not solve the complexities of returning to convertibility. The government had enough gold to redeem its own notes, but commercial

banks did not. Table VI shows commercial banks balance sheet at December 1894. According to those figures the ratio of specie to outstanding notes was 0.40 and that of specie to notes plus deposits was 0.05; in other words, if notes and deposits were transformed into gold coins, banks would have gone bankrupt.

TABLE VI
Commercial Banks Balance Sheet: December 1894
(Thousand of Current Pesos)

<i>Assets</i>		<i>Liabilities</i>	
Specie Holdings	7,485	Outstanding Bank Notes	19,146
Fiscal Notes	26,036	Deposits	129,873
Loans	154,267	Net Worth	51,331
Other Net Assets	12,562		
Total	200,350		200,350

SOURCE: A. Llona, *Chilean Monetary Policy*, Appendix C.

Aware of these circumstances, the authorities passed an additional law in May 1895 establishing that the Treasury would fully redeem secured bank notes in gold coins as if they were fiscal notes⁷. Banks would recover their notes by giving to the government their gold value. They also could give letters of credit with a 6.1 interest rate and a monthly three percent sinking fund; in this case, notes would not be returned to the banks. The law also limited the amount of bank notes to those already registered with the Mint.

The conversion scheme had several problems, some related to the monetary system, others to the functioning of the economy. In terms of the monetary system, it established specie circulation and effectively eliminated fiduciary currency after 1897. A monetary system with this characteristics curtails financial intermediation by commercial banks. The law was bound to generate a contraction of the money stock. However, once the short-term impact of the conversion was over, the new law did not solve the perennial problem of Chilean banking legislation: credit overexpansion. There was no provision requiring banks to hold any reserve over

⁷ Fully secured bank notes were notes from those banks that had deposited with the Treasury specie and/or government bonds, fiscal notes, municipal bonds or mortgage bonds to fully back their issues.

deposits. In other words, this conversion strategy was a return to square one, to the pre-1878 situation, the only difference being that banks were not able to issue notes, so that external shocks would be transmitted faster to the domestic economy.

The short-term impact of the monetary contraction was amplified because the exchange rate fixed for conversion was not the current rate: the average rate in 1893 was sixteen pesos per pound, in 1894, 19.5 pesos, in January 1895, 16.9 pesos and in February 1895, 15.1 pesos. From there on the exchange rate appreciated fast to reach 13.56 pesos in June. Business conditions, which were already weak due to the world crisis, further deteriorated due to appreciation. Subercaseaux described a grim situation: «Of the nine existing banks [...] seven were constituted as incorporate companies; and of these four were compelled to close their doors.» Later, «Interest rates underwent an extraordinary increase, while the quotation of mortgage bonds and other securities suffered a pronounced decline, as did the value of rural and urban properties. All this, moreover, was accompanied by an extraordinary paralysation of business and general restriction of credit.»⁸ Fetter concentrated on the severity of the external shock: Chilean prices were low in gold terms and there were poor grain harvests in 1894, 1895 and 1897. «The serious economic situation is shown in the decline in the operations of the banks, the rise in interest rates, and the abrupt increase in the payments in arrears to the *Caja de Credito Hipotecario*»⁹. Valdes Vergara wrote that the 1895 conversion caused «... slow and painful sacrifices that were the cause of many misfortunes; desolating many households who had ruinously liquidate solid business fortunes and prosperous business. [These sacrifices] enriched some with the deprivation of others producing new elements of social discord and unrest.»¹⁰

As shown in Table VII, there was a severe depression in banking activity: deposits fell by more than forty percent while credit operations fell by twenty percent from June to December of 1895. This extraordinary shrinkage is the result of two combined and reinforcing causes: the public tried to reduce its holdings of deposits to obtain gold coins, and at the same time banks were forced to build up bullion reserves equal to 100 percent of their issues. The only way out was an absolute reduction in the stock of credit.

Table VIII shows the movements of the money supply components during this period. Besides the banking depression, the virtual elimination of fiscal notes provoked a fall of more than twenty percent in the nominal money stock. This

⁸ Subercaseaux (1922), p. 115.

⁹ Fetter (1931), p 101.

¹⁰ Valdes Vergara (1913), p. 11.

figure was probably higher because the public was inclined to hoard gold coins instead of using them; at least this is what contemporary economists observed. In fact the ratio of currency in hands of the public to deposits rose from twenty percent in June 1895 to 48.7 percent in June 1898. But this was a rational attitude: given bad business conditions, banks solvency problems and an extremely delicate situation with Argentina, expectations of returning to inconvertibility were high; and with inconvertibility there was the possibility of realizing a new capital gain by sticking to one's coins.

TABLE VII
Banking Activity Indicators: 1894-1898
(Thousand of Current Pesos)

<i>Year</i>	<i>Specie Holdings</i>	<i>Loans</i>	<i>Deposits</i>	<i>Bank Notes</i>
1894.2	7,485	154,267	129,873	19,146
1895.1	11,319	145,830	131,572	21,334
1895.2	14,199	148,107	122,266	19,841
1896.1	12,843	127,163	98,885	19,937
1896.2	16,338	135,958	103,078	18,856
1897.1	13,524	n.a.	96,500	19,328
1897.2	14,592	133,919	100,572	14,862
1898.1	13,300	n.a.	91,000	10,900
1898.2	9,505	146,435	128,976	0

SOURCE: A. Llona, *Chilean Monetary Policy*, Appendix C, p. 309, Table 79.

The impact of the monetary restriction on domestic interest rate and the spread was severe, as shown in Table VIII. Those figures do not contradict contemporary economists' appreciation of the severity of the crisis. The yield of Caja de Credito Hipotecario bonds rose to 9.75 percent in 1896, the highest since 1878, and the spread between this rate and that of British consols was 7.47 percentage points.

Given the high capital mobility observed in those years, one would have expected gold inflows to take advantage of the higher Chilean interest rate; these inflows would have eased the monetary stringency, but they never took place.

The depression provoked by the conversion reached its trough by mid 1897. In July 1897 bank deposits were only forty million pesos compared with ninety-six

the previous month and, although there was appreciation of the exchange rate, imports fell by thirteen percent. Table VI shows that the interest rate remained at an extremely high level for an economy under the gold standard. The interest rate differential did not induce capital inflows, on the contrary, from 1895 to 1897 there was an outflow of gold coins.

TABLE VIII
Monetary Aggregates: 1894-1898
(Thousand of Current Pesos)

<i>Year</i>	<i>Currency</i>	<i>High Powered Money (1)</i>	<i>Nominal Money Stock</i>	<i>Domestic Interest Rate</i>	<i>Spread</i>	<i>Exchange Rate \$/£</i>
1894.2	38,361	42,190	161,344	n.a.	n.a.	17.30
1895.1	36,675	39,772	165,247	8.84	6.45	13.57
1895.2	22,859	35,403	137,220	n.a.	n.a.	13.76
1896.1	32,326	42,650	131,211	9.75	7.47	13.81
1896.2	37,362	49,600	137,780	n.a.	n.a.	13.71
1897.1	39,530	48,200	136,030	9.02	6.77	13.71
1897.2	39,772	47,400	135,972	n.a.	n.a.	13.61
1898.1	44,300	51,700	135,300	8.95	6.67	13.91
1898.2	19,022	41,173	147,998	n.a.	n.a.	18.82

NOTE:

(1) The monetary base is equal to banks' reserves plus the amount of coins in the hands of the non-banking public. Note that bank reserves can only be specie or gold coins and that it is possible to calculate the stock of coins in the system because the amount of notes redeemed is known and so is specie trade.

SOURCE: A. Llona, *Chilean Monetary Policy*, Appendix C.

By the end of 1897 and beginning of 1898 the crisis was slowly passing. However, a long standing border dispute with Argentina became quite acute. Congress held long secret sessions during May and June of 1898 debating the possibility of war and the government raised defense expenditure and negotiated the purchase of two new battleships.

The shaky situation of the remaining banks, added to rumors of an imminent return to inconvertibility due to the coming war, provoked a run on the banks of Santiago and Valparaíso. Fetter reported «... on Tuesday, July 5 [1898], a heavy run started on the Santiago office of the Banco de Chile, by far the most important

bank in the country. The run continued on July 6 with even greater severity, although it did not spread to other banks or cities in Chile. A panic existed which, if left unchecked, would have certainly resulted in the failure of the bank.»¹¹

In view of these circumstances the authorities ordered the banks to close their doors for four days. Congress, meeting in secret session on July 11, 1898, passed a moratorium forbidding any executive action leading to foreclosures for thirty days. On July 31, 1898, Congress passed a bill restoring inconvertibility. The law authorized the government to issue fifty million pesos of legal tender notes, inclusive of the existing bank notes, the existing bank notes were declared fiscal. The most important provision of the law was to rescind commercial banks' right to issue notes. The bill also established that the government could use as much of the new issue as needed to solve the banks' liquidity crunch. By July 6, 1898, outstanding bank notes came to 19,056,548 pesos and by the end of the month they had received from the government 21,666,541 pesos¹². This action added to inconvertibility, stopped the run on the banks and reestablished public confidence in the banks. The cost was a sharp depreciation: the peso fell from \$ 13.91 per pound in June to \$ 18.28 in September and \$ 18.82 in December 1898.

After thirty-seven months of convertibility, the government could not dilute the public's expectation of an eventual demise of the gold standard. The extremely high interest rate and spread for this period coupled with the absence of capital inflows constitute proof of this assertion. Several circumstances converge to transform expectations into realizations. In the first place, the law had four serious technical mistakes: (1) it set the par rate at \$ 13.33 per pound when the market rate was \$ 19.10, i.e., it implicitly carried a price deflation of thirty percent, (2) it required full bullion backing for bank notes, but it did not establish a minimum reserve ratio for deposits, thus permitting banks to overexpand credit, (3) it established specie circulation —taxes and government services had to be paid in coins— which aggravated the crisis of July 1898 and (4) it did not establish a central bank or, at least, a currency board that could have acted as lender of last resort. In the second place, the economy faced during those years a severe external shock: the price of nitrate had fallen from £ 9.225 in 1894 to £ 7.65 in 1897, the average export price index fell by ten percent from the average of 1890/94 to the average of 1895/98. In the third place, the diplomatic crisis with Argentina put both countries at the brink of war, under these circumstances few people thought that convertibility could be maintained.

¹¹ Fetter (1931), p. 107. This incident is also reported by Subercaseaux, 1922, p. 116.

¹² Santelices (1900), pp. CLXXIV-CLXXV.

5. 1898-1908: FROM ABSTINENCE TO INDULGENCE

The new monetary arrangements, by rescinding the banks' right to issue notes, made the Treasury the sole institution empowered to issue fiduciary money. Inconvertibility severed the link between balance of payments and monetary base. Although this feature may be welcome, the new arrangements did not provide a mechanism for supplying high powered money. Subercaseaux stated that «The new monetary system, reduced as it was to a fixed circulation of Treasury notes, was absolutely inelastic.»¹³ The monetary base became solely the stock of fiscal notes in circulation, and its change the result of discretionary policy.

This monetary system was among the weakest in Chilean history: money supply was left to fluctuate due to changes of the deposits multiplier, i.e., banks' reserve ratio, which, in turn, is the outcome of the banks' portfolio management. By then, the government had saved the banks in July 1878, May 1893 and July 1898; therefore, the profit function of the banks incorporated the already fulfilled expectation of the government acting as lender of last resort. Consequently, the deposit reserve ratio was lower than the one implicit in the banking law; which established unlimited liability. Therefore, the authorities' aim to limit credit overexpansion by rescinding the banks' right to issue notes backfired in an ominous way: banks expanded by reducing the reserve ratio, thus increasing the likelihood of insolvency.

The economy accommodated rapidly to the new regime. By mid- 1899 the exchange rate had appreciated to \$ 15.48 per pound. The domestic interest rate declined from 8.95 percent in 1898 to 7.87 percent in 1900, the spread declined from 6.67 in 1898 to 6.04 in 1899 and 5.33 in 1900. General business conditions improved while commercial banks fully recovered and expanded rapidly. Table IX shows the tremendous expansion of loans and deposits from 1898 to 1904. However, the same Table depicts that this expansion was on weak foundations: commercial banks not only reduced their reserve ratio, but the absolute level of reserves dwindled from 1898 to 1904.

Falling domestic interest rate and spread plus improvement of Chilean export prices had positive effects on the domestic economy, particularly investment expenditure. The economy experienced a stock market boom accompanied by an outburst of financial speculation, especially after 1904. Capital incorporated into new joint stock companies rose from an annual average of 18.6 million gold pesos from 1900 to 1903 to 66.6 in 1904, 174.92 in 1905 and 172.7 in 1906^{14 15}.

¹³ Subercaseaux (1922), p. 117.

¹⁴ See for example Castedo (1982), pp. 351-352 and Fetter (1931), pp. 120-121.

¹⁵ Gold peso is the monetary unit created by the Conversion Law of 1895, its worth is 18 pence, or 13.33 gold pesos per pound.

TABLE IX

Commercial Banking Expansion: 1898-1908
(Thousand of Current Pesos, Balances December 31)

<i>Year</i>	<i>Reserves</i>	<i>Loans</i>	<i>Deposits</i>	<i>Deposit- Reserve Ratio</i>
1898	28,151.00	146,435.00	128,976.00	0.22
1899	31,245.13	158,255.00	90,851.00	0.34
1900	31,731.50	156,253.41	118,350.00	0.27
1901(1)	14,101.01	108,154.06	88,254.93	0.16
1902	16,522.74	174,997.88	131,253.31	0.13
1903	14,126.56	162,860.50	127,669.00	0.11
1904	17,208.87	201,691.63	157,130.00	0.11
1905	33,542.78	317,712.69	286,601.94	0.12
1906	46,836.47	450,312.81	356,304.81	0.13
1907	50,071.72	478,548.81	379,497.13	0.13
1908	64,903.42	472,072.50	387,242.81	0.17

NOTE:

(1) This year does not include foreign banks.

SOURCE: A. Llona, *Chilean Monetary Policy*, Appendix C.

Bankers began to feel the constraint imposed by a fixed monetary base on the second semester of 1904 and they complained about the lack of circulating media. In December 1904, banks' reserves were at a low level: the reserve ratio was only 10.9 percent. After some debate Congress authorized the government to issue thirty million pesos in fiscal notes, of which ten million went to the government as general revenue and twenty million were used to buy mortgage bonds from the Caja de Credito Hipotecario. This operation was performed in installments from January to October 1905. Now there was plenty of money in the economy, Table X shows that in 1905 the monetary base rose by 46.6 percent and the nominal money stock by 71.2 percent. Money rain, i.e., the component of the money increase that became fiscal revenue, represented nineteen percent of the money base thus the price level should have risen by that much. Table X shows that that was the case.

The open market operation component of the monetary increase, i.e., buying mortgage bonds, produced the expected fall of the domestic interest rate, and curiously enough the spread also fell. Under normal conditions, the spread should have not fallen due to inflationary expectations, but in those years the price of copper as well as that of nitrate were rising. Consequently, the exchange rate depreciated by only 4.8 percent, and there was real appreciation.

TABLE X
Monetary Policy Indicators: 1899-1908
(Thousand of Current Pesos, Balances December 31)

Year	<i>High powered money</i>	<i>Nominal money stock</i>	<i>Domestic interest rate</i>	<i>Spread</i>	<i>Non-traded price index (1)</i>	<i>Exchange rate \$/£</i>
1899	50,797	139,433	8.95	6.04	47.33	16.55
1900	50,746	149,299	8.40	5.33	49.26	14.29
1901	50,769	n. a.	7.87	5.01	52.06	15.12
1902	50,395	165,126	7.63	4.73	46.30	15.80
1903	50,467	164,009	7.24	4.49	48.47	14.44
1904	54,983	194,904	6.94	4.11	49.00	14.65
1905	80,611	333,670	6.57	3.80	57.88	15.36
1906	120,412	429,880	6.75	3.92	77.30	16.69
1907	150,536	479,962	7.14	4.17	85.26	19.84
1908	150,222	472,561	7.41	4.51	90.26	24.94

NOTE:

(1) This price index intends to capture non-traded goods price level, from 1899 until 1908 it includes, with equal weights, twelve agricultural commodities; from 1908 until 1925 the index is a weighted average between the previous one and a wholesale price index for manufactures; the weights are given by the relative importance in production of the two sectors. The index base is 1913 equal to 100.

SOURCES: A. Llona, *Chilean Monetary Policy*, for monetary data; M. Ballesteros and T. Davis, «El Crecimiento de la Producción y del Empleo en Sectores Básicos de la Economía Chilena», for prices of manufactures and *Simopsis Geográfica y Estadística*, several issues, for agricultural prices.

Under these favorable conditions, bank credit further expanded and speculation in the stock market continued unabated. Bank reserves, however, started to dwindle again early in 1906. In March 1906, Subercaseaux set reserves at 22.2 million pesos ¹⁶. Assuming deposits did not change from December 1905 to March 1906, the reserve ratio would have been only 7.8 percent. By April 1906 there were rumors about the banks' lack of liquidity, these rumors affected, in particular, the biggest commercial bank ¹⁷. But as in other occasions, Congress was ready to help and on May 1906 it authorized the issue of forty million pesos in fiscal notes. Of these, twenty million became government revenue and twenty million could be taken by credit institutions or private citizens against gold deposits of eighteen pence per peso. In case these funds were not taken by the public, they could be

¹⁶ Subercaseaux (1922), p. 121.

¹⁷ Subercaseaux (1912), pp. 260-261.

deposited in the banks for future governmental use. Being the market exchange rate much lower and the gold given in exchange for fiscal notes not returnable, the operation was not profitable and thus not performed, hence the authorities deposited twenty million pesos in the banks.

In 1906 the monetary base rose by forty million pesos, almost fifty percent while the nominal money stock grew by 28.8 percent. This time prices rose by 33.5 percent and the exchange rate depreciated by 8.65 percent. Besides its inflationary impact, the new issue postponed the bursting of the speculative bubble and bank reserves were restored to 13.1 percent ratio. This time the new issue did not reduce the interest rate: money entered the economy as money rain. Domestic interest rate rose 0.18 points, while the spread rose to 3.92 percentage points¹⁸. The stock market bubble burst, in part as a consequence the international crisis of 1907/8. There were some bank failures, accompanied by a jump of the domestic interest rate, spread and exchange rate (see Table X) The government response was a new issue of thirty million pesos in September 1907. This new issue was introduced through an open market operation: the Treasury bought mortgage bonds. The monetary base rose to 150.5 million pesos and the nominal money stock reached 479.9 million pesos.

During the last three years — 1905, 1906 and 1907 — policy makers postponed a financial crisis by increasing liquidity and saving banks from insolvency. This policy induced an investment boom, but it also generated a price jump: domestic prices rose by more than eighty percent from 1904 to 1908. Inflation, with its generally depressing effects on real wages, provoked a wave of social unrest. In October 1905, the so called «huelga de la carne» in Santiago degenerated into a riot suppressed by the Army. State railroad workers went on strike in 1906 demanding their wages to be paid in pesos of eighteen pence, a condition met by the government. The saddest of these incidents happened in Iquique on December 1907, where 200 people — men, women and children — were killed in the Presidente Santa Maria School where they had concentrated waiting for the government's response to their demands.

6. SOBRIETY REGAINED: 1909-1925

The inflationary episode which began in 1905 was already subsiding by the second half of 1908. Public and politicians became increasingly opposed to a

¹⁸ It should be mentioned that in August of 1906 an earthquake destroyed large sections of Valparaiso. It is likely that reconstruction of this important port created enough activity to absorb part of the new monetary issue and thus reduced its inflationary impact.

monetary policy consisting of lump-sum increases of the monetary base whenever banks ran out of reserves. Consequently, the law authorizing the 1907 money issue also established the *Oficina de Emision*. Its goals were to stabilize the exchange rate and to provide elasticity to the circulating media. This agency was to issue legal tender notes against gold deposits at a fixed exchange rate of eighteen pence per peso. Depositors would receive a nominative but endorsable certificate stating the amount of gold deposited as well as the amount of fiscal notes issued in their favor. Depositors could use this certificate to withdraw their gold by returning the same amount of notes originally issue to them. The *Oficina de Emision*, in turn, had to destroy the returned notes. There were no restrictions to issue new legal tender notes guaranteed by gold, but the already existing 150 million pesos of outstanding registered fiscal notes remained inconvertible.

Operating with *Oficina de Emision* depended on profitability which, in turn, was a function of the market exchange rate and the spread between domestic and international interest rates. At the time this legislation passed, the market exchange rate was 10.78 pence per peso, therefore the operation would have been profitable if the spread was above fifty-nine percentage points. Consequently, the *Oficina de Emision* did not function.

Monetary and banking activities expanded rapidly until 1911. As shown in Table XI, this development started from a fixed monetary base, therefore the money stock grew only via deposit creation and by reducing the reserve ratio. As in other instances, banks began to complain about the scarcity of circulating media in 1911. Fetter described the situation as «currency starvation»¹⁹. Lack of reserves became so acute that in March 1912 Banco de Chile, the country's biggest bank, deposited a total of £ 600.000 with the *Oficina de Emision*, obtaining eight million pesos to enlarge its reserves²⁰. In addition to the banking crunch, the government decided to sell fifty million pesos of mortgage bonds it owned thus depressing their price and raising the domestic interest rate²¹. Banks trying to accumulate reserves plus the government selling bonds generated a monetary contraction that weakened overall business activity. (See Table XII).

To no one surprise banks asked the government for help, but this time public opinion was against lump-sum issues of currency. The authorities modified some regulations of the *Oficina de Emision*: (1) the parity was set at twelve pence, (2) banks had to increase their gold deposits in case of appreciation and (3) banks could obtain notes up to the value of their net worth.

¹⁹ Fetter (1931), p. 127.

²⁰ Fetter (1931), p. 128.

²¹ Martner (1923), p. 617.

TABLE XI
Banking Indicators: 1909-1925
(Thousand of Current Pesos, Balances December 31)

Year	Reserves	Loans	Deposits	Deposits- reserve ratio
1909	61,808	484,559	370,814	0.17
1910	52,931	537,047	447,195	0.12
1911	45,424	706,292	527,082	0.09
1912	53,618	673,117	490,188	0.11
1913	64,400	684,324	491,390	0.13
1914.1	67,546	639,812	442,998	0.15
1914.2	103,904	629,708	510,503	0.20
1915	73,587	654,146	521,561	0.14
1916	68,378	646,462	529,049	0.13
1917	74,413	729,420	584,294	0.13
1918	99,371	971,103	924,884	0.11
1919	118,074	1,150,776	1,031,997	0.11
1920	151,962	1,344,373	1,133,791	0.13
1921	181,704	1,480,532	1,282,274	0.14
1922	145,251	1,535,244	1,198,933	0.12
1923	137,925	1,651,057	1,298,137	0.11
1924	132,233	1,685,690	1,207,816	0.11
1925	175,567	1,614,288	1,236,487	0.14

SOURCE: A. Llona, *Chilean Monetary Policy*, Appendix C.

Under these new conditions banks began to use regularly the mechanism provided by the Caja de Emision: 20.3 million pesos were issued in 1912 and 15.3 in 1913. Banks used these additional funds to increase the reserve ratio that reached thirteen percent in 1913.

From an institutional point of view, the functioning of the Caja permitted a less strident discussion of the possibility to return to convertibility. During the first semester of 1914 parliamentary negotiations were almost completed for establishing the Caja de Conversion. This agency was similar to a currency board, but under a gold exchange standard rather than pure gold standard, which better fulfilled the needs of the economy. The outbreak of WWI prevented further action in this direction.

The short-run consequences of the outbreak of hostilities in August 1914

were disastrous for Chile: the nitrate market collapsed, reducing government revenues and generating a fiscal crisis of dramatic proportions. On the monetary side, there was a quasi-financial panic as people withdrew their deposits from commercial banks, especially those of German ownership. Nitrate producers paralyzed their activities and laid off thousand of miners. With the major industry of the country on the verge of closing and banks becoming rapidly insolvent, the administration acted rapidly to help both bankers and miners. It promoted legislation to keep the level of nitrate production at pre-war levels and to help banks.

TABLE XII
Monetary Policy Indicators: 1909-1925
(Thousand Current Pesos, Balances December 31 (1))

<i>Year</i>	<i>High powered money</i>	<i>Nominal money stock</i>	<i>Domestic interest rate</i>	<i>Spread</i>	<i>Non-traded price index (2)</i>	<i>Exchange rate \$/£</i>
1909	150,251	459,257	7.43	4.45	91.51	22.26
1910	150,324	544,588	7.00	3.92	94.06	22.26
1911	150,848	632,505	6.89	3.70	95.69	22.59
1912	170,904	607,474	7.70	4.42	92.01	23.70
1913	186,041	613,032	8.55	5.16	100.00	24.61
1914.1	184,241	576,041	8.92	5.46	108.37	24.53
1914.2	224,980	631,579	n. a.	n. a.	n. a.	28.15
1915	177,712	625,686	8.95	5.13	140.13	29.09
1916	178,908	639,581	8.40	4.09	124.83	25.35
1917	186,162	696,043	8.27	3.69	150.40	18.85
1918	227,688	1,053,201	8.13	3.73	145.71	16.45
1919	250,781	1,164,704	7.04	2.42	165.30	22.68
1920	302,822	1,284,651	7.47	2.15	197.90	19.88
1921	324,631	1,425,200	7.69	2.48	172.91	32.80
1922	301,958	1,355,639	7.39	2.96	182.02	36.55
1923	295,503	1,452,715	7.36	3.05	180.33	37.07
1924	336,265	1,411,848	7.83	3.44	184.97	41.45
1925	393,697	1,454,617	8.01	3.58	228.61	40.99

NOTES:

(1) Monetary figures for 1914 are balances at June 30 and December 31, exchange rate figures are monthly averages for June and December.

(2) This price index intends to capture non-traded goods price level, from 1899 until 1908 it includes, with equal weights, twelve agricultural commodities; from 1908 until 1925 the index is a weighted average between the previous one and a wholesale price index for manufactures; the weights are given by the relative importance in production of the two sectors.

SOURCES: Same as Table X.

To help the banks Congress authorized the issue of Treasury Notes in favor of the banks. These notes were legal tender to be used in any transaction. Banks had to satisfy the following conditions to obtain notes: (1) they had to pay interest on those notes set at three percentage points lower than their lending rate, (2) they had to guarantee this issue with mortgage bonds and/or government bonds, but these bonds would be valued at ninety percent of their market quotation and (3) they could receive Treasury notes up to fifty percent of their net worth. Although this law was intended to last one year, it operated until the foundation of the Central Bank in 1925. This open market operation was similar to the one performed during the 1880s, but more costly: the Treasury charged not only interest, but received the guarantee at ninety percent of its market value. Subercaseaux claims that this operation was very expensive for the banks, particularly because they were not lending these additional funds but increasing their reserves ²².

To help hard-pressed nitrate producers to keep production levels, the authorities implemented a special lending program. It consisted of granting advances of \$ 87 per metric ton ready to export and \$ 65 per metric ton processed in plant to all producers who agreed to keep their mines running. The loans were made in the form of letters of credit issued by the Treasury with nitrate as guarantee. These instruments of credit could be discounted by the banks and they could use these letters of credit as collateral for obtaining Treasury notes.

As shown by Table XII, financial markets were shattered by the crisis: the exchange rate depreciated from \$ 25.26 per pound in July to \$ 31.57 in December 1914, the stock of loans shrank; the interest rate rose to 8.93 percent, and the Santiago and Valparaiso Stock Exchanges had to close for a few days to avoid «a demoralisation of the market brought about by the necessarily low quotations of foreign exchange and securities in general.» ²³ The run on the banks was severe during August and September. The government deposited 1.5 million pounds of its own funds in the Caja de Emision to help Banco de Chile, Banco Español and Banco Nacional, the largest commercial banks in the country, which allow them to obtain thirty million pesos from the Caja ²⁴. Fetter also stated that during those months Treasury notes in circulation reached 24.7 million pesos; the monetary base increased by sixty-five million pesos in August 1914, more than sixty percent.

By the end of 1914, most of the operations aimed at salvaging the banks were reversed. The public regained confidence in the monetary system due to the government's willingness to act as lender of last resort. In December 1914 banks had

²² Subercaseaux (1922), p. 158.

²³ Subercaseaux (1922), p. 156.

²⁴ Fetter (1931), p. 137; Martner (1923), p. 622.

increased reserves to reach a reserve ratio of twenty percent, an unusual figure in Chilean history (see Table XI).

The nitrate market began to improve by the end of 1915. From there on Chilean economic situation began to strengthen and commercial banks started to expand again. As in previous periods, banks expanded by reducing their reserve ratio, instead of using the newly established mechanisms to expand the monetary base. Table XII shows that by 1918 the reserve ratio had fallen to 10.7 percent. It was certainly less expensive to increase the credit multiplier instead of performing open market operations or depositing gold at the Caja de Emisión.

From 1914 to 1918 operations through Caja de Emisión explain more than eighty-five percent of the changes in the monetary base. In 1914 these operations were the second source of expansion and in 1915 the primary source of contraction. The explanation, at least for thirty million pesos is the loan given by the government to the banks in August-September 1914, that the banks paid back in 1915. Although this operation was profitable during the war years, Table XIII indicates that it was not widely used. This was due to the following causes: (1) once the war started international capital mobility was severely restrained, in particular gold flows, moreover the United Kingdom and France abandoned the gold standard, the only place where Chilean banks could obtain gold was New York, a financial center with poor ties to Chile then and (2) Caja de Emisión regulations required the banks to increase their gold deposits whenever the exchange rate rose above twelve pence (\$ 20 per pound), furthermore, additional deposits had to be made physically in gold. The nominal exchange rate appreciated by almost thirteen percent from 1915 to 1916, by the second quarter of 1917 the paper peso had risen to 12.362 pence (\$ 19.41 per pound), in December 1917 it reached 14.5 pence (\$ 16.55 per pound) and in June 1918 it was at 17.2 pence (\$ 13.95), i.e., the paper peso was quoted at almost par with the mythical gold peso of eighteen pence. Banks had to supplement their original gold deposits to meet the market exchange rate, but this operation proved very expensive as the price of gold skyrocketed in terms of the now devalued pound. In 1917 the Chilean gold coin of 0.599103 grams —the gold peso of eighteen pence— was quoted at 20.07 pence, in June 1918 at 23.70 pence and in December 1918 at 21.12 pence. To keep the Caja de Emisión working, the authorities modified its operation allowing any person to operate with the agency, but more important they established that in case of withdrawal deposits could be paid in bills of exchange over London or Santiago. At the time the gold coin in Chile was worth twenty-six pence and in London only eighteen pence. It became impossible then for the currency to appreciate beyond eighteen pence because it was always possible to obtain bills of exchange on London at eighteen pence. Table XI shows that this modification permitted banks to obtain 45.6 million pesos from the Caja.

TABLE XIII

Sources of Monetary Base: 1914-1925
(Thousand of Current Pesos, Balances December 31)

Year	Caja de emision	Open market operations	Nitrate program	Bank notes	Change in monetary base
1914	11,157	6,880	21,256	-353	38,940
1915	-32,946	3,090	-17,405	-12	-47,273
1916	6,094	-9,696	4,857	-47	1,208
1917	6,753	7,529	-7,029	-1	7,252
1918	45,689	-7,097	2,935	-1	41,526
1919	-13,483	879	36,624	-927	23,093
1920	-12,258	29,643	34,656	0	52,041
1921	-39,743	44,864	16,689	0	21,810
1922	-1,960	-7,526	-13,187	0	-22,673
1923	11,300	38,145	-58,720	0	-9,275
1924	-750	49,201	-4,876	0	43,575
1925	-2,260	65,784	-6,164	0	57,360

SOURCE: A. Llona, *Chilean Monetary Policy*, p. 246 and p. 257.

As mentioned earlier, open market operations authorized in August 1914 proved to be rather dear if performed to increase reserves or pay back deposits. In 1916, once the crisis of was over, almost all the Treasury notes were returned to the Treasury, as shown in Table XIII. This operation had a positive impact on the monetary base in 1917, when banks felt a higher demand for credit due to the expansion of the economy. With respect to the nitrate program, it was an important source of expansion of the monetary base in 1914, but its effect was almost totally reverse by December 1915.

Contrary to initial expectations Chile benefitted from the war. Nitrate is used in the production of gun-powder, therefore demand soared: the average amount of nitrate exported from 1916 to 1918 was 2.88 million metric tons, while the average for 1909 to 1913 was only 2.42 million tons. Besides, competitive bidding by France, the United Kingdom and the USA allowed the price of nitrate to reach historical heights: in 1917 it was quoted at £ 12.75 per metric ton, which in terms of pounds of purchasing power of 1913 is equal to £ 7.92 pounds. Consequently, GDP rose by almost twenty percent from 1914 to 1917.

Although the price level rose in 1915, it remained stable during the war. This is

explained by a combination of three factors: (1) an enormous increase in output, (2) an almost constant money supply in nominal and real terms and (3) a strong appreciation of the exchange rate.

This picture of prosperity came crashing down with the collapse of the nitrate and copper markets in 1919. Table XIV shows that not only prices of these commodities fell by more than sixty percent in real terms, but the volume of exports dropped by a record figure: copper by twenty-three percent and nitrate by seventy-three percent. This grim picture improved somewhat during 1920, but it deteriorated again in 1922. The share of copper in exports began to increase rapidly in 1922 while that of nitrate to fall. The real price of nitrate never reached the level of 1913 and nitrate exports increased only by volume expansion.

TABLE XIV
Copper and Nitrate Exports: 1916-1922

Year	Copper			Nitrate		Exports (Thousand tons)
	£/ton (1)	£/ton (2)	Exports (tons)	£/ton (1)	£/ton (2)	
1916	90.37	70.93	71,904	8.52	6.69	2,980
1917	104.82	65.06	94,987	12.75	7.92	2,776
1918	93.14	65.06	92,534	13.12	6.87	2,919
1919	51.99	23.10	71,002	10.91	4.85	804
1920	86.80	32.05	85,165	14.41	5.32	2,746
1921	52.74	21.74	53,426	17.25	7.12	1,193
1922	55.87	27.47	120,330	10.27	5.05	1,252

NOTES:

(1) Prices in Chile expressed in current pounds.

(2) Pounds with purchasing power of 1913.

SOURCE: Prices from A. Llona op. cit., pp. 27-30. Volume of exports: *Sinopsis Geográfica y Estadística*, several issues.

One of the consequences of the external crisis was a sharp depreciation of the peso with respect to pound and the American dollar. Table XV indicates that the Chilean peso depreciated in 1919 by thirty-eight percent with respect to the pound and by fifty percent with respect to the American dollar. From an economic point of view the evolution of the real effective exchange rate is more important

because it gives an idea of the reallocation of resources as a consequence of the crisis. The real exchange rate for the period 1919/25 is twenty-nine percent below the average for the 1913/18 period.

TABLE XV
Nominal and Real Exchange Rate: 1913-1925

Year	\$/£	\$/US\$	Real effective exchange rate (1)
1913	24.62	5.12	1.00
1914	26.76	5.74	1.05
1915	29.09	6.07	1.02
1916	25.35	5.37	1.26
1917	18.85	4.07	1.06
1918	16.45	3.47	1.07
1919	22.68	5.21	1.43
1920	19.89	5.73	1.25
1921	32.80	8.84	1.51
1922	36.55	8.41	1.36
1923	37.07	8.21	1.37
1924	41.45	9.29	1.51
1925	40.99	8.55	1.30

NOTE:

(1) Real effective exchange rate = Nominal exchange rate * Weighted average of trade partners price indexes/Chilean wholesale price index of non-traded sectors.

SOURCES: Nominal exchange rates: *Sinopsis Geográfica y Estadística*, several issues. Chilean price index: M. Ballesteros and T. Davis, *op. cit.* Foreign price indexes: American, *Statistical Abstract of the United States*; European, B.R. Mitchell, *European Historical Statistics*, 2nd edition, 1980.

The fall of the terms of trade reduced disposable income. At the same time the closing of the nitrate mines from 1920 to 1922 generated a flow of unemployed migrants from the northern provinces to Santiago. Under these circumstances the socio-political situation became extraordinarily fluid: the middle classes protested for their falling income levels and workers for their losing of jobs and declining real wages. In this social context, the presidential election of 1920 resulted in the triumph of the populist candidate: Arturo Alessandri. The new administration had to face serious political problems derived from the economic downturn.

The President's legislative program stalled in Parliament while the political climate became increasingly tense. In January 1921, less than a month after inau-

guration, a strike in the north was brutally repressed by the army. Workers were protesting the closing of the Oficina San Gregorio. In a confuse episode, 130 people were killed including «workers, women and children.»²⁵ The government tried to censor news on the incident, but once it became publicly known it had to face serious demonstrations and near riots throughout the country. Political tension mounted, fueled in part by the authoritarian character of Mr. Alessandri that made compromising quite difficult. Finally on September 11, 1924 a bloodless coup d'etat interrupted almost one hundred years of constitutional rule. In 1925, the military unable to run the country had to call Mr. Alessandri back. During the last year of his administration two important reforms took place: (1) a new constitution changed the political system from a parliamentarian one to a presidential one and (2) a set of economic reforms included the establishment of the Central Bank and the adoption of the gold exchange standard.

From 1919 to 1925 monetary policy was almost completely dominated by the crisis, especially its fiscal component. It could have not been otherwise: in 1919 the deficit reached 30.4 percent of expenditures, in 1920-1922, 18.7, 40.5 and 36.8 respectively. In terms of the GDP, these percentages are: 2.89, 1.72, 6.05 and 4.84 respectively. The authorities had no alternatives but to borrow from the private sector. They did so by issuing medium term bonds in the domestic market. But borrowing was not enough and for the first time since 1879, the government had to issue notes for financing a fiscal deficit. The size of the deficit and the populist character of the administration made it politically impossible to address the fiscal crisis through contractionary policy measures: higher taxes and lower expenditures.

The issue of domestic public debt contributed to an increase in the monetary base. As shown in Table XIII from 1920 to 1925 the main source of expansion of high powered money was open market operations. A second source of issue was the nitrate program, reestablished in 1919. It was an important source of issue up to 1921, but once the nitrate market stabilized in 1922, it began to work as a contractionary force. Money issue through Caja de Emisión resulted in a contraction of the monetary base. In November 1918 the government forbade gold exports; besides, for those who had deposited gold or bills of exchange and obtain notes at eighteen pence, the operation had turned unprofitable. By 1925 the amount of notes guaranteed by gold deposits was reduced to thirteen million pesos.

Domestic price level was really jittery from 1919 to 1922. The consumer price index shows inflation rates of 5.7 and 8.6 percent in 1924 and 1925, which are in part a response to the move toward closing the economy, thus allowing industrial prices to rise above their international level.

²⁵ Castedo (1982), p. 861.

The creation of the central bank is one of the major accomplishments of this period. President Alessandri asked Professor Edwin Kemmerer, the «Money Doctor», to visit the country in 1925 to establish the central bank. Dr. Kemmerer's propositions were not different from proposals already made by Chilean economists, but never seriously considered by Congress. The Kemmerer mission recommended: (1) the establishment of a Central Bank with the monopoly of note issue against gold deposits or bills of exchange denominated in convertible currencies, (2) the par rate was set at 6 pence per peso, i.e., \$ 40 per pound, which was the market exchange rate the time, (3) the reform of the banking legislation which included the a required reserve ratio and the creation of a Banking Superintendency in charge of fiscalizing banks' accounts. These reforms were adopted and the Central Bank open its doors to the public in 1926.

7. CONCLUSIONS

Two major issues dominated Chilean monetary policy: (1) creation of high powered money and (2) regulation of banking activities. These problems are not independent and they are also closely related to the exchange rate regime. Chile's definite solution was the establishment of a central bank, the adoption of the gold exchange standard and the establishment of a government agency to control banks' portfolio management. Besides the monopoly of note issue, the central bank had the power to set the legal or minimum deposit-reserve rate and it also became the lender of last resource. These measures are a consistent set of rules designed to ensure financial stability by shifting to the central bank risks associated with external and domestic shocks.

From 1860 to 1924 there were several periods where the rules were inconsistent, thus bringing financial crises. The two gold standard periods, 1818/1860-1878 and 1895-1898, did have severe inconsistencies. If the government is willing to act a lender of last resort, financial stability under the gold standard requires setting a minimum specie backing for notes and a minimum deposit-reserve ratio, this is so because banks include in their profit function the cost of insolvency, which is greatly reduced by the existence of a lender of last resort. Theoretically the government does not have to guarantee the solvency of the banks, in that case and given unlimited liability, banks should be left free to set both, backing and the deposit-reserve ratio, the market will penalize risk-love bankers vis a vis risk-averse ones by discounting the former's notes. By accepting bank notes in tax payments without discounting for risk, they actually became guarantors of the banking system soundness. Not surprisingly banks reduce their backing and reserve ratios to the point of becoming insolvent.

Under paper money consistency requirements are less stringent, financial stability is guaranteed by the existence of a smooth mechanism for the creation of high powered money. Ideally this mechanism should be market regulated instead of discretionary changes in the base. The backing requirement for bank notes in mortgage bonds is a good example of this regime. During this period, there was no need for a central bank nor for a lender of last resort and the system enjoyed sixteen years of remarkable stability. The economy fared well and did not endure the contractionary consequences of the retirement of fiscal notes. The cost of this regime was domestic inflation. Inflation and the ideological commitment to convertibility forced the authorities to abandon paper in favor of gold with the consequences describes in section three.

A paper money regime without a smooth mechanism for the creation of high powered money plus the banks' certainty of the government acting as lender of last resort is not stable. Banks, knowing that the government would come to their rescue, increased the money supply by reducing the deposit-reserve ratio to the edge of insolvency.

A paper money regime with a variety of mechanisms for the creation of high powered money, like the one from 1912 to 1924 proved very solid. It survived WWI and the postwar depression. But the regime could not survive a different inconsistency, that of keeping a stable price level with a rising budget deficit. Domestic inflation, added to a renewed world commitment to the gold standard made the establishment of the central bank cum gold standard possible.

Finally, regarding the exchange regime, the most important requirements for a fix exchange rate regime to work is price flexibility, absolute and relative. The wish list also includes a relatively stable external sector. Domestic prices were not as flexible as required at least at times when flexibility was a necessity and the economy suffered not only from severe external shocks, but from 1880 until 1898 terms of trade secularly declined at a rate of 2.5 percent per year. Under a fix exchange regime, domestic prices need to undergo deflation to accommodate falling terms of trade, it seems unrealistic to expect domestic deflation at a rate of 2.5 percent per year during eighteen years.

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