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Bailing Out: Internal versus External Convertibility

In the previous chapter we discussed the evolution of the Argentine financial system before and after the First World War. The various diagnostic tests that we performed suggested the system was in relatively poor shape throughout the interwar period, but it is the aim of this chapter to point out the critical juncture at which the collapse of the system seemed perilously close. To understand this turn of events, we rely on the often overlooked distinction between external and internal convertibility.

From 1914 until 1927, Argentina's currency was inconvertible; the window of the Conversion Office was, so to speak, closed. Thus, the national gold stock was safe, and no external drain (a conversion of notes to specie) could take place. Ipso facto, there could therefore be no conversion of deposits to specie either, so that an internal drain was temporarily ruled out by the inconvertible currency.

A key question for Argentine policymakers as they contemplated rejoining the gold standard in the late 1920s—although it is anyone's guess as to whether they considered this possibility—was whether this stable state of affairs would still prevail if convertibility were resumed. That is, if some adverse shocks hit the macroeconomy or the banking sector, or both, could the system be subject to a "meltdown" scenario, with a run on both the banks and the currency board itself? To address this question, we must examine whether the banking system maintained the same sound inside-money practices that enabled the prewar convertibility regime to function so well.

With the wisdom of hindsight, we employ a simple model and econometric test to show that unsound practices led to an unstable outcome in 1927–29. Our finding helps account for the fleeting two-year convertibility period 1927–29 and the sudden demise of the interwar gold standard in Argentina. Since this kind of experience was not unique to Argentina, the approach also has wider ramifications for other currency and banking crises under fixed exchange rates, both in the Great Depression and in recent years.

Crises—Internal and External

In the wake of recent developing-country macroeconomic-financial crises, one of the more pressing questions confronting researchers and policymakers has been to discover what kind of money and banking regime might be optimal for a small open economy.[1] The problem is of course acute in the context of a fixed exchange-rate regime, a system usually motivated by a desire to dampen external price volatility or discipline domestic monetary and fiscal policy in the wake of hyperinflationary experience. Such regimes can take a variety of forms, such as a discretionary central bank adhering to a peg or a more rigid institution such as a currency board with hard rules designed to "tie the hands." Whatever the form, the key dilemma of the money-banking nexus is never far away: how can goals of external convertibility (a fixed exchange rate) and internal convertibility (a working fractional-reserve banking system) be simultaneously met?

As is well known, problems in both macroeconomic and financial areas can strike together, the so-called "twin crises," and the exact causal relationship between the two remains an area for research.[2] Recent events powerfully demonstrated this type of dynamic in an era of globalization, and the combination of pegged rates and weak banking systems is now seen as a major cause of the Asian crises of 1997–98. However, noting the contrast to the fragile exchange-rate regimes that just collapsed, some observers now advocate one type of institutional innovation that seemed to weather all of the recent storms. The Hong Kong Currency Board and the Argentine Convertibility Plan apparently coped well with a dismal international financial situation and are under study as possible models for more robust designs in other countries. Can these schemes be a basis for a monetary and financial design that will function well in this kind of global economic environment? We think a combination of theory and history can provide some answers.

From a historical perspective we note that the late-nineteenth and early-twentieth century experience of the periphery has much in common with the current situation. Emerging markets on the periphery were joining the ever-expanding markets of the core, there was widespread use of a fixed exchange-rate system, and fledgling banking systems were learning how to function in this new environment. In our study of Argentine history we find that the present types of problems have earlier ancestors in the turbulent interwar economy.

1. In the Asian crises of 1997–98 considerable difficulty was caused by a weak financial sector in general, and, specifically, the large number of insolvent banks that had been propped up for many years in an environment of lax regulation and supervision. At the time of crisis, the size of bad assets in the financial sector threatened either to destroy the entire superstructure for intermediation, or else require substantial subsidies to cover the large gaps between true assets and liabilities. In countries like Korea and Indonesia, a very large clean up of the banking sector was precipitated, requiring considerable real resources. For a discussion of the recent crises and the relationship between banking sector weaknesses and macroeconomic crisis, see Eichengreen (1999), Roubini (n.d.b), and World Bank (1999).
2. Kaminsky and Reinhart (1999).

More important, we find that the Argentine institutional structure in money and banking changed considerably in the first decades of the twentieth century, as did its vulnerability.

If we are to analyze this historical episode from a theoretical perspective, we need to turn to a set of models that integrate banking and financial crises into models of currency crisis. However, the so-called first- and second-generation models of currency crisis finessed the distinction between inside and outside money and the banking sector was excluded from the analysis.[3] More recently, and motivated in part by the contours of recent crises, scholars have turned their attention to the problem of twin crises—that is, the internal and external convertibility problem. This embryonic literature draws on ideas found in some vintage papers in the literature, notably the work of Díaz Alejandro, but the theoretical base is still being developed with close attention to how we can best match the empirical regularities.[4] In that spirit, we draw on an older and somewhat neglected model of the money-banking nexus by Dornbusch and Frenkel, an approach they applied to an even more distant historical situation.[5]

The Dornbusch-Frenkel theory was developed to illustrate the short-run dynamics of the gold standard regime and the operations of the Bank of England in the crisis of 1847. This elegant model addressed the actions of two quasi-independent parts of the Bank: the Issue Department and the Banking Department. The former was concerned with outside money, the paper note issue and its gold backing; the latter dealt with inside money, and engaged in normal commercial banking operations, yet it also had a special role as the banker to the state, being responsible for handling government debt. The model traces the dynamics of gold backing for the currency (subject to *external drain*) and the backing of banking deposits by reserves (subject to *internal drain*).

This approach is notable for its multiple equilibrium possibilities. There can be a stable "good equilibrium" with high reserve ratios and a high gold stock in a strong banking environment where neither internal nor external drain threaten the system. There can also be an unstable "bad equilibrium" with low reserve ratios and a tendency to banking collapse with full internal—and possibly some external—drain. In the former equilibrium, confidence in the bank runs high, and an interest-rate defense is feasible, but in the latter case confidence is so low that an interest-rate defense is self-defeating and the drain only increases.

3. In early currency-crisis models a fixed exchange rate collapsed when money printing was used to finance a fiscal gap (Krugman 1979). In later models, self-fulfilling crises were also shown to be possible, where external markets punish a good borrower and the withdrawal of capital leads to collapse (Obstfeld 1994; 1996).
4. Díaz Alejandro (1985b). For a survey of the issues see Eichengreen (1998). Theoretical work includes papers by Velasco (1987) and Calvo (1996; 1998). A key empirical contribution is the paper by Kaminsky and Reinhart (1999).
5. Dornbusch and Frenkel (1984). In a recent important contribution, Miller (1996) refines and expands the Dornbusch-Frenkel model, incorporating a Krugman-style approach to a speculative attack and incorporating forward-looking expectations.

We think the applicability of this model to the Argentine situation in the years 1900–1935 is clear: the currency board, the Conversion Office, was the analog of the Issue Department, and the quasi-state bank, the Banco de la Nación Argentina (BNA), functioned just like the Banking Department. The two were linked to the same public-sector balance sheet in the sense that they were both government agencies and, in practice, the Conversion Office was eventually called on to make rediscounts to the state bank to keep it afloat. That is, the state bank (and possibly some of the big private banks) received ex post—and quite possibly expected ex ante—implicit state guarantees via a de facto banking insurance provision.

What are the implications of our analysis? At one level, there are general implications for the study of the interwar period and the demise of the gold standard. We know a great deal about outside money in this era: much has been written about monetary authorities, the impact of the trilemma, and political-economy issues. Yet we know much less about inside money: the role of the financial sector as a possible source of regime inconsistency is less understood. If the lessons of the Argentine experience can be applied to other countries' histories then we might get a better sense of the conflicts between money and banking regimes in the 1920s and 1930s, and a clearer view of the slender tightrope on which policymakers were poised. This could yield a more nuanced explanation of what many see as a still largely unanswered puzzle: why the gold standard, a system that had functioned so well before 1914, was suddenly "unsafe for use" in the 1920s. [6]

At a narrower level, our work has direct implications for the institutional design of money and banking regimes. Suppose a fixed exchange-rate, or *external convertible*, regime is credible. Our paper suggests that commercial banks can be in a permanently sustainable situation *for sure* only if they specialize in administering the means of payment of the economy—that is, if they become *narrow banks*. Such specialization would leave riskier banking activity to other *uninsured* institutions such as investment houses and merchant banks (Fama 1985). This might be the only design in which one can attain the goals of *both* external and internal convertibility *even under a very bad state of nature.*

Simply put, under the traditional design of a gold-exchange standard (or currency board) and a banking regime you can only "price" outside money—but not banking deposits, the main component of inside money. In the event of a crisis of confidence, such as a Diamond-Dybvig run on deposits, the system might end up being governed by the dynamics of a bad (unstable) equilibrium from which there is no escape.[7] Such dynamics would destroy internal and

6. Some references works on the interwar period and its long-run context are Eichengreen and Sachs (1985); Eichengreen (1992a; 1992b; 1996); Temin (1989). The quoted phrase is Temin's.
7. Diamond and Dybvig (1983).

external convertibility alike, taking down the institutions of both—the currency board and the banks—with it.

To sum up, having a strong and credible currency board may be no defense against a crisis if the banking sector is rotten and a nasty shock occurs. This sentiment has been often expressed in policymaking circles in the wake of the recent crises, especially by those who reject the idea of currency boards as a universal panacea.[8] Still researchers seek more empirical support for the argument, and, given that the debate rages on, we think there is value in having explored the problem here with a more formal, theoretical, and empirical treatment.

The Argentine Banking Environment and Its Evolution

As we noted in earlier chapters, after the catastrophic crisis in 1890–91 the government took great care in designing a new regime to replace the fragile decentralized system of the past. It was hoped that a new money and banking regime would usher in an era of stability sufficient to permit Argentina to rejoin the gold standard. Two institutions were central to the plan. The first was the currency board: for the first time the state centralized the power to issue money within the new Conversion Office. The second was the newly reformed state bank: The Banco Nacional was liquidated during the Baring financial crisis in 1891 and was refounded as the Banco de la Nación Argentina in 1891. The two institutions were kept at arm's length so as to effectively isolate two functions. External convertibility was to be the sole task of the conversion office. Internal convertibility was the domain of the Banco de la Nación and the private financial system.

The new state bank had multiple roles as the financial agent of the state, a development bank, and as one of the biggest commercial banks. Could it handle all these tasks safely? A new charter was put in place governing bank reserves at the Banco de la Nación so as to limit its rediscounting capacity. Despite being seemingly "too big to fail," and clearly susceptible to the moral hazard risks that attach to any banking institution with implicit state guarantees, the Banco de la Nación maintained an admirably clean balance sheet in the period of recovery and smooth economic growth from 1892 to 1913 (Table 8.1). As a fraction of overall banking activity, its use of rediscounts was small even after a relaxation of banking laws in 1904; nonperforming loans were few; leverage was not excessive and there appeared to be adequate capital on the balance sheet (Figure 8.1). The reserve-deposit ratios stayed very high, well over 50 percent in most years before the war (Figure 8.2).

8. For a discussion of recent issues in banking structure to prevent crises, see, for example, the "Economics Focus" discussion of narrow banks and subordinated debt ideas ("Better than Basle," *The Economist*, June 19, 1999). On the role of currency boards as incomplete insurance against crisis, see, for example Gavin and Hausmann (1998) and Feldstein (1999). For a more trenchant critique of currency boards see Roubini (n.d.a).

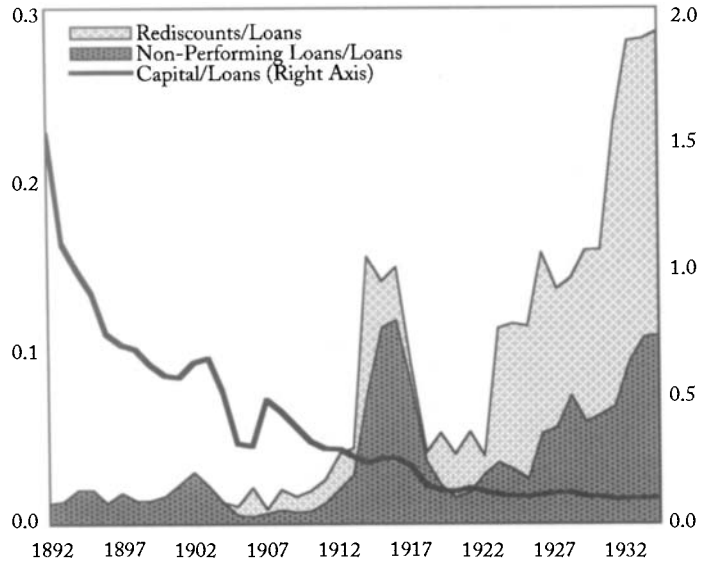
Table 8.1. *Banco de la Nación, Balance Sheet Items, 1892–1934*

	Loans				Banking Reserves			Liabilities		Ratios		
Year	Total	Redisc	To Govt.	Non-Perf.	Total	Gold	Paper	Capital	Deposits	Redisc. to Loans	Non-Perf. Loans	Capital to Loans
1892	33	0	—	0	22	1	21	50	37	0.00	0.01	1.52
1893	46	0	—	1	52	5	47	50	57	0.00	0.01	1.09
1894	51	0	—	1	49	1	47	50	57	0.00	0.02	0.98
1895	56	0	—	1	46	2	44	50	58	0.00	0.02	0.89
1896	68	0	—	1	39	2	37	50	58	0.00	0.01	0.74
1897	72	0	—	1	40	3	37	50	59	0.00	0.02	0.69
1898	74	0	—	1	48	3	45	50	67	0.00	0.01	0.68
1899	81	0	—	1	45	3	43	50	72	0.00	0.01	0.62
1900	87	0	—	1	63	18	44	50	77	0.00	0.02	0.57
1901	88	0	—	2	68	25	43	50	78	0.00	0.02	0.57
1902	80	0	—	2	62	19	43	50	80	0.00	0.03	0.63
1903	78	0	—	2	99	34	66	50	111	0.00	0.02	0.64
1904	98	0	—	1	97	49	47	50	124	0.00	0.01	0.51
1905	166	1	—	1	77	26	51	52	152	0.01	0.00	0.31
1906	178	3	—	1	74	21	52	54	144	0.02	0.00	0.30
1907	222	1	—	1	97	42	55	107	173	0.00	0.01	0.48
1908	254	3	—	2	119	52	68	110	246	0.01	0.01	0.43
1909	302	3	—	2	182	79	103	113	347	0.01	0.01	0.38
1910	367	4	—	3	177	83	94	117	391	0.01	0.01	0.32
1911	415	6	—	5	217	77	139	121	413	0.01	0.01	0.29
1912	433	9	—	9	253	86	168	125	478	0.02	0.02	0.29
1913	496	8	—	14	259	73	186	128	541	0.02	0.03	0.26
1914	541	43	—	41	386	65	321	128	605	0.08	0.08	0.24
1915	504	13	—	57	386	23	362	128	692	0.03	0.11	0.25
1916	503	16	—	59	401	34	367	128	756	0.03	0.12	0.25
1917	583	7	72	47	380	84	296	129	871	0.01	0.08	0.22
1918	905	5	411	32	398	82	315	132	1,195	0.01	0.04	0.15
1919	1,064	32	361	24	357	89	268	139	1,250	0.03	0.02	0.13
1920	1,162	29	338	18	462	56	406	145	1,412	0.03	0.02	0.12
1921	1,074	38	148	20	463	53	410	150	1,310	0.04	0.02	0.14
1922	1,225	13	151	35	392	53	340	152	1,396	0.01	0.03	0.12
1923	1,369	107	153	49	326	29	296	152	1,479	0.08	0.04	0.11
1924	1,436	122	154	45	283	19	264	153	1,503	0.08	0.03	0.11
1925	1,386	123	85	36	333	35	298	144	1,499	0.09	0.03	0.10
1926	1,398	147	87	73	355	35	320	157	1,533	0.11	0.05	0.11
1927	1,330	106	76	75	482	161	321	158	1,621	0.08	0.06	0.12
1928	1,336	92	70	99	596	318	278	161	1,749	0.07	0.07	0.12
1929	1,557	156	71	92	262	68	193	162	1,665	0.10	0.06	0.10
1930	1,573	152	67	99	228	3	225	163	1,657	0.10	0.06	0.10
1931	1,724	285	94	117	246	2	243	164	1,457	0.17	0.07	0.10
1932	1,687	316	95	158	261	2	259	165	1,498	0.19	0.09	0.10
1933	1,686	293	336	183	256	2	254	165	1,578	0.17	0.11	0.10
1934	1,669	295	349	182	189	0	189	165	1,565	0.18	0.11	0.10

Notes: Units are millions of paper pesos, except ratios. Data are end-of-year. Gold pesos are converted at market rates before 1899 and at parity of 2.27 after 1899. Before 1905, capital is book value.

Sources: Appendix 1 and balance sheets of Banco de la Nación.

Figure 8.1. Banco de la Nación Balance Sheet, 1892–1934

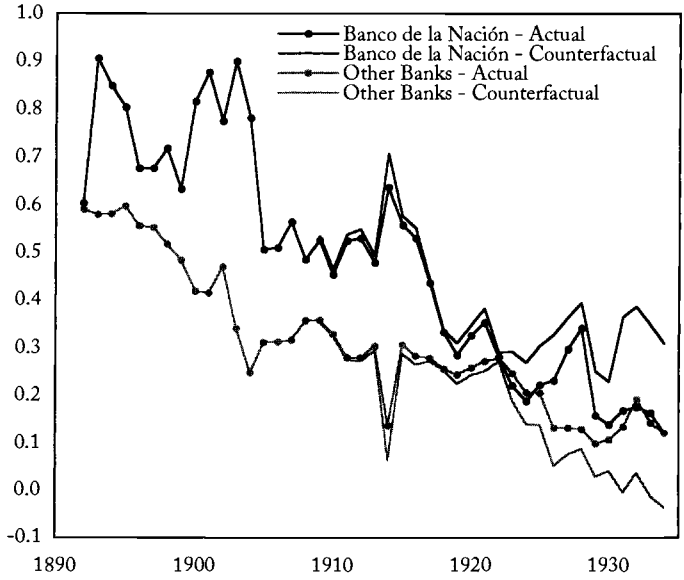


Notes and sources: See Table 8.1.

The system worked well, and a clean separation of the two functions was maintained until the crisis of 1913–14 when an emergency rediscount law was enacted. The dimension of the crisis cannot be overstated: this was by far the biggest recession in Argentine history, and the cumulative loss of output during the trough exceeded such losses in the Baring Crisis and the Great Depression. Real activity slumped and the financial sector consequences were dramatic. Private banks came under pressure as depositors withdrew cash. Curiously, exactly the opposite was happening at the Banco de la Nación, where reserve-deposit ratios climbed (Table 8.2). Clearly, the public perceived the state bank as a "safe haven" for their deposits, perhaps because of its implicit guarantees. With reserve ratios falling to 14 percent in the private banks, the emergency law permitted some relief as the Banco de la Nación began rediscounts to the private banks to supply them with much-needed cash.

The implications of this new economic environment for the state bank's balance sheet after 1914 were dire. Rediscounting surged as a fraction of all banking activity, nonperforming loans started to corrupt the balance sheet in a big way, and the capitalization level of the bank was gradually sinking. We can estimate how much of a difference the rediscount activity made to bank balance sheets by considering a counterfactual experiment. Suppose the Banco de la Nación had not used the emergency powers; then one can recalculate the balance sheets of the Banco de la Nación and the private banks absent the asset

Figure 8.2. Reserve-Deposit Ratios, Actual (with Rediscounts) and Counterfactual (without Rediscounts), 1892–1934



Notes and sources: See Table 8.1.

swap; that is, with cash reserves equal to the rediscounts added to the Banco de la Nación's portfolio, and with the same cash subtracted from the private banks' portfolios.

The impacts are striking when seen in Figure 8.2. For example, in the 1913–14 crisis, absent the rediscount provision, the private banks would have seen their reserve-deposit ratio fall under 10 percent, and dangerously close to total illiquidity at zero. The calamitous situation did abate as the Argentine economy recovered after 1914, but further deterioration in balance sheets came about in the 1920s. Even with rediscounts, private banks saw reserve ratios slide from around 25 percent in 1920 to about 10 percent in 1930. The counterfactual calculation hints at the shocking implication that, without the actions of the Banco de la Nación, the private banks would have failed under a total collapse of liquidity in the early 1930s. Clearly, the rediscount law as it applied to the Banco de la Nación helped a wounded banking system limp along for many years in the interwar period.

Such weaknesses had been exposed during the financial crisis of the late 1880s when a loss of confidence in the banks prompted a massive currency substitution by the public. Still, legislators and policymakers took a seemingly relaxed view even after this chilling experience. Admittedly, note issue had been

Table 8.2. *Selected Banking Ratios, 1892–1934*

	Banking Reserves to Deposits		Banco de la Nación Share of	
	Banco de la Nación	Other Banks	Total Loans	Total Deposits
1892	0.60	0.59	—	0.18
1893	0.91	0.58	—	0.23
1894	0.85	0.58	—	0.22
1895	0.80	0.60	—	0.21
1896	0.68	0.56	—	0.20
1897	0.68	0.55	—	0.20
1898	0.72	0.52	—	0.22
1899	0.63	0.48	—	0.21
1900	0.82	0.42	—	0.20
1901	0.88	0.42	—	0.21
1902	0.78	0.47	—	0.20
1903	0.90	0.34	—	0.23
1904	0.78	0.25	—	0.22
1905	0.51	0.31	—	0.22
1906	0.51	0.31	—	0.20
1907	0.56	0.32	—	0.23
1908	0.49	0.36	0.30	0.28
1909	0.53	0.36	0.29	0.30
1910	0.45	0.33	0.28	0.29
1911	0.52	0.28	0.28	0.30
1912	0.53	0.28	0.28	0.32
1913	0.48	0.30	0.32	0.38
1914	0.64	0.14	0.44	0.51
1915	0.56	0.31	0.39	0.49
1916	0.53	0.28	0.36	0.47
1917	0.44	0.28	0.36	0.46
1918	0.33	0.26	0.40	0.45
1919	0.29	0.25	0.43	0.44
1920	0.33	0.26	0.41	0.43
1921	0.35	0.27	0.40	0.41
1922	0.28	0.28	0.43	0.42
1923	0.22	0.25	0.44	0.45
1924	0.19	0.21	0.46	0.45
1925	0.22	0.20	0.44	0.45
1926	0.23	0.13	0.43	0.45
1927	0.30	0.13	0.42	0.46
1928	0.34	0.13	0.39	0.44
1929	0.16	0.10	0.42	0.43
1930	0.14	0.11	0.40	0.42
1931	0.17	0.13	0.46	0.41
1932	0.17	0.19	0.49	0.42
1933	0.16	0.14	0.49	0.46
1934	0.12	0.12	0.49	0.46

Notes and sources: See Table 8.1. Other banks includes Banco de la Provincia de Buenos Aires, also partly state-owned, and all domestic and foreign private banks.

centralized; but in most other respects an overwhelmingly laissez faire attitude to the banking sector persisted.[9]

In this atmosphere, at least until the beginning of the First World War, the idea of a central bank and more modest plans for regulating and supervising the financial system were foreign to the thinking of the monetary authorities not to mention the banking community itself.[10] Instead, the money and banking system evolved in an ad hoc fashion. Changes were implemented piecemeal through various legislation, notably the emergency law of 1914. The reforms of the 1890s nationalized the currency and instituted a firm nominal anchor, but the question remained then—as it still does today in many developing countries—whether just the act of macroeconomic and monetary stabilization alone can suffice to generate a stable financial environment. Either through choice or neglect, the authorities of the 1892–1914 period appear to have optimistically believed that with the monetary problem solved the banking sector would take care of itself. For several decades, their gamble appeared to pay off.

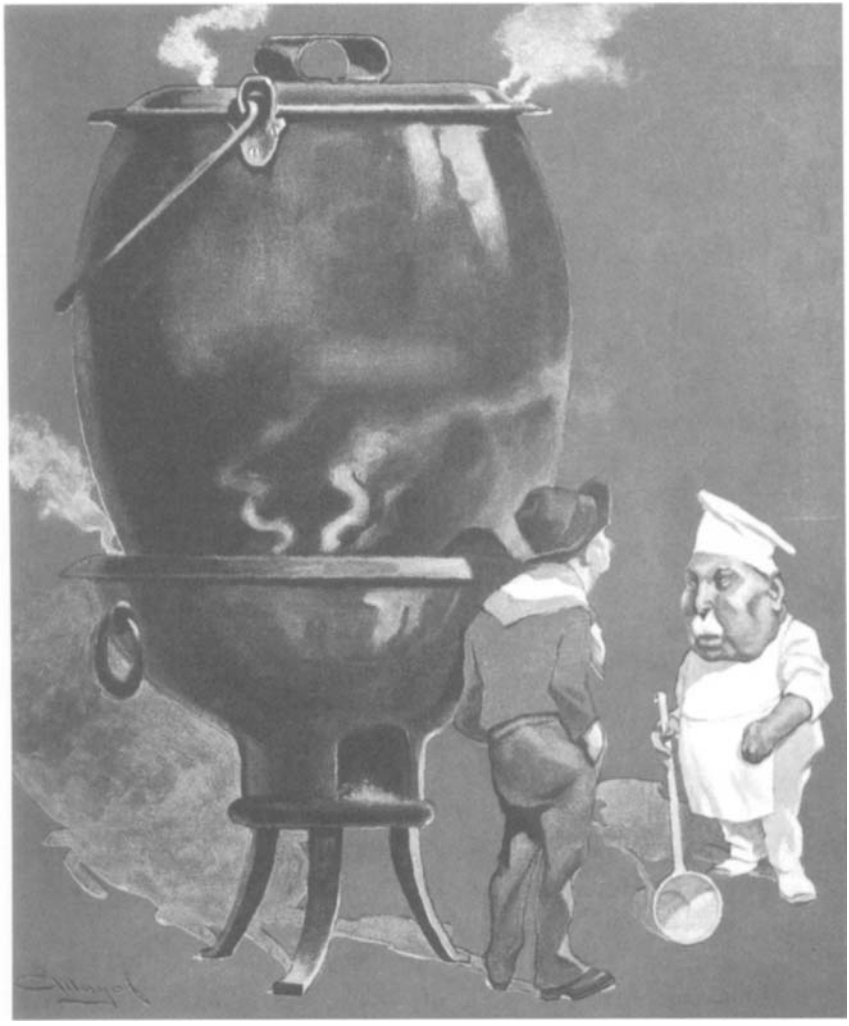
The 1913–14 crisis was an almost fatal blow for the financial system. Luckily, the Banco de la Nación stood ready to save the day. This is still something of a puzzle. We know the Banco de la Nación did not have an explicit Lender-of-Last-Resort mandate. It was not a true central bank and was given these kinds of powers in an ad hoc fashion. Why was the rediscount law enacted? And why, even then, given its banking objectives, did the Banco de la Nación take on the risks associated with rediscounting to private banks, when the collateral took the form of the low-quality assets then sitting on the private banks' balance sheets? This we consider an important political economy question.[11]

The new rediscounting by the state bank provided a bailout to the private banks once, ex post, they realized that a bad state of the world had hit. In essence, they obtained, if not free, then highly subsidized banking insurance from a government that had made no such commitment ex ante. That such an inconsistent policy choice should have been made says a good deal about the machinations inside the Argentine corridors of power. Rich and powerful interests, including officers and shareholders of the banks, desperately needed cover from the risks they had taken, the loans that had gone bad. Some of

9. There were other institutional gaps. It is frustrating for historians that before 1900 the *Memorias de Hacienda* (Treasury reports) did not systematically include any consolidated monetary and banking statistics.

10. In 1917, President Hipólito Irigoyen (1916–22) made a first attempt, through his Minister of Finance Domingo Salaberry, to establish a central bank and outlined a preliminary project, but the plan did not meet with the approval of Congress.

11. In 1914, the capital and reserves of the Banco de la Nación amounted to 24 percent of loans, while the sum of rediscounts to private banks and nonperforming loans were equivalent to 16 percent of loans—a difficult, but clearly solvent situation. By 1931, the capitalization fell to 10 percent of loans; soft rediscounting and nonperforming loans amounted to 24 percent of loans, and increased to an all-time high of 29 percent by 1934. On top of this potentially insolvent situation, after 1930 the Banco de la Nación had systematically overlent to the government, with treasury-bill rediscounts exceeding the ceiling of 25 percent of capital.



Cartoon 8.1. *El puchero salvador. — Ya está la olla preparada, y pienso salvar la situación, echándole dentro las moratorias, las economias, el empréstito, y los redescuentos. — Pues, va a salir muy flaco el caldo, porque todo eso tiene muy poca substancia.* (The stew of salvation. [Cook] — The pot is prepared, and I think it will save the situation, I am putting in overdue debts, economies, loans, and rediscounts. [Person] — Then the stew will be very thin, because all these have very little substance.)
Notes: This cartoon expresses doubts about the effectiveness of the Emergency Laws of 1914. President Victorino de la Plaza is the cook.
Source: Caras y caretas, año 17, no. 832, September 12, 1914.

those same loans, we also know from confidential records, were loans to the very same officers and shareholders, or to their real or shadow corporations. Such activities certainly give the appearance of corrupt banking operations and probably would not have occurred under a careful system of regulation and supervision.[12]

We do not know what it took for the banks to secure this kind of help, but get it they did—in two forms. The Banco de la Nación from 1914 to 1935 did what it could through rediscounts to keep the banks out of an illiquidity crisis. Ultimately, in 1935, as part of a political economy solution worked out by the government and its new central bank, the banks got the final bailout they sought to head off an insolvency crisis arising from decades of bad loans—a solution with high social costs that we consider below.

In considering the nature of these rescues, we should also mention the information asymmetries that made the ongoing liquidity provision by the state bank in the 1910s and 1920s a bigger bailout than the simple rediscount figures alone suggest. The private banks were trying to offload risks to the state bank. Ideally, the risks they would offload first would be the bad ones. This would likely be private information for them, unknown to the state bank. That is, there was a "market for lemons" problem in the use of loans as collateral whereby private banks have an incentive to use as collateral the worst paper they hold.[13] This problem of adverse selection continually weakened the balance sheet of the Banco de la Nación.

In the end, if the rediscounts themselves went bad—as they were declared to be in the 1935 bailout—the bad collateral would end up on the state balance sheet. In this way, we see that the system was evolving toward a central banking idea in a very incoherent manner. In its rediscounting actions the Banco de la Nación was *not* engaged in pure Lender-of-Last-Resort actions, like a true central bank following Bagehot's principle of lending freely at a penalty rate. Such actions would have left the bad loans with the private banks while extending temporary liquidity. Instead, the state bank was offering a much sweeter, and therefore more risky deal. It allowed the private banks to shed their risks, with ex post (and possibly ex ante) bad paper used as collateral, and lent them cash at only 4.5 percent—far below even the rate the Banco de la Nación offered its customers on time deposits!

Changes in the banking environment in 1913–14, and the interaction between the state and private banks, marked the birth of a severe moral hazard problem for the money and banking regime in Argentina. During the Baring Crisis many banks had been allowed to fail, even very large banks like the Banco

12. The source for this information is the confidential reports of the Instituto Movilizador de Inversiones Bancarias (IMIB), the body appointed in 1935 by the Central Bank to "clean up" the rotten assets of the banking sector. We discuss the activities of the IMIB in a later section.
13. On the "lemons" problem, see Akerlof (1970).

de la Provincia de Buenos Aires. No Lender-of-Last-Resort actions had been taken by the monetary authorities—since no unified monetary authority had then existed. Banking insurance arrived later, in an ad hoc manner, and quite possibly through nefarious means. It was later taken up by the central bank after 1935, generating over the decades since a series of financial sector bailouts, paid for out of seigniorage in times of high inflation, and whose real social costs, like that of the 1935 rescue, have been carefully guarded.

A Model of Fractional Banks in a Gold Standard Regime

As may already be apparent, there were widening tensions during the 1920s between the goals of external and internal convertibility in the Argentine case. During the suspension Argentina had managed the trilemma by allowing a float of the exchange rate, keeping open the option to move capital and have an activist monetary policy.

The activist monetary policy could obviously not emanate from the Conversion Office, which, as we have noted, did not deviate from its mandate to match note issues by gold on the margin. Activism was emerging, however, in the new workings of the Banco de la Nación, which now engaged in large rediscount operations—a policy that amounted to setting a lending rate to the other private banks, a nominal target. Upon resumption of the gold standard, however, the Conversion Office would be aiming to set the exchange rate—potentially a second nominal target, an inconsistency under an open capital market, and a possible source of external drain in a bad state of nature.

The second inconsistency, and the focus of this section, was the internal problem of drain from the banking system. A fractional reserve system allows agents to convert deposits into cash on demand.[14] The problem is that this is not sustainable in the event of one or more sufficiently bad shocks that create a run, or internal drain. Unlike a central bank, the Banco de la Nación could not bail itself out by issuing currency to itself—it could only get itself bailed out by the Conversion Office, which could, by resort to its emergency rediscount provision, issue currency not backed by gold.

This is our view of events in the 1900–1914 and 1927–29 gold standard regimes. Agents perceived an implicit unified balance sheet of the two state institutions, the Conversion Office and the Banco de la Nación. Thus the dynamics of outside and inside money were to be inextricably linked, and the health of each institution depended on the behavior of the other. The way we approach modeling these dynamics is through the dual-equilibrium version of the Dornbusch-Frenkel (1984) model already mentioned.

14. Thus we think it no surprise that Salama (1997) finds a correlation of gold stocks and the Banco de la Nación reserve-deposit ratio. This just describes the process of linked internal and external drains, and in our model we put quite a different interpretation on this phenomenon.

In the model, the Conversion Office has a balance sheet that consists of liabilities in the form of circulating notes MB (high-powered money or monetary base), and assets comprised of gold G and securities S. Here S consists of the balance sheet counterpart fixed fiduciary issue, the virtual assets that offset the unbacked notes in circulation. Here, $MB = G + S$. The Banco de la Nación, the state bank, has a balance sheet with liabilities comprised of banking deposits both private D and public D', and assets in the form of note reserves R (vault cash) and loans L. Here, $R + L = D + D'$. The financial model hinges on an appropriate specification of money demand. Consider the broad money stock M, consisting of currency in the hands of the public plus private deposits at banks. Then, it is easy to verify that,

$$M = \frac{1+c}{c+r\alpha}(G+S) = m(c, r)(G+S), \tag{8.1}$$

where $m(c, r) = (1+c)/(c+r\alpha)$ is the money multiplier, $\alpha = (D+D')/D$ is the ratio of total to private deposits, $r = R/(D+D')$ is the reserve-to-total-deposit ratio of the bank, and $c = (MB - R)/D$ is the currency-to-private-deposit ratio of the (nonbank) public. Clearly, $\partial m/\partial r < 0$ and we can also assume that $\partial m/\partial c < 0$, since $r\alpha = R/D < 1$ in the empirically relevant range.[15]

The currency-to-private-deposit ratio c desired by the public is now assumed to depend on how banks behave, specifically through the reserve-to-total-deposit ratio r chosen by the bank. A higher reserve ratio at the bank inspires confidence and leads to a lower demand for currency, so that $c = c(r)$, where $c' < 0$. We can then write broad money M as

$$M = \tilde{m}(r)(G+S), \tag{8.2}$$

where $\tilde{m}(r) = m(c(r), r)$.

Note that the relationship of the multiplier to the reserve-to-total-deposit ratio r is ambiguous: $\tilde{m}'(r) < 0$ and $\tilde{m}'(r) > 0$ are both possible and we consider this in a moment. Money market equilibrium will generate an equilibrium interest rate such that

$$\tilde{m}(r)(G+S) = L(i, y), \tag{8.3}$$

where $L_i < 0$, $L_y > 0$. Supposing that output y remains exogenous in the short run, we can solve for the interest rate

$$i = i(r, G; \ldots), \tag{8.4}$$

15. See Friedman and Schwartz (1963) for the derivation. Following Dornbusch and Frenkel (1984), we are ignoring here the role of other private banks. That is, we treat the Banco de la Nación, which already accounted for 50 percent of the banking sector by the 1930s, as a proxy for the entire system. However, an alternative view would be to integrate the balance sheets of the Banco de la Nación and the private banks and study the dynamics of the entire system. This is justified, if, as actually happened, the private banks have an implicit insurance guarantee from the state bank. We repeated the exercise with this aggregation of all the banks and the results were unchanged.

where $i_G < 0$.

We introduce dynamics as follows. Bank policy is assumed to be driven by a desired reserve-deposit ratio $\tilde{r}(i)$, where $\tilde{r}$ is a decreasing function of the interest rate i. Here, better lending opportunities lead the bank to reduce the liquidity of its balance sheet in a prudent way so as to seek profits. Still, the bank is cautious, so the actual adjustment of r to its target level $\tilde{r}$ is posited to be a partial adjustment process, as the bank updates its portfolio position in light of new information, such that

$$\dot{r} = \nu(\tilde{r}(i) - r), \tag{8.5}$$

where $\tilde{r}' < 0$ and ν is a positive adjustment-speed parameter. Finally, this being a small open economy with a fixed exchange rate, we assume a rate of gold inflow that is driven by deviations of the local interest rate i from the world rate i^*. Thus,

$$\dot{G} = G(i - i^*; \ldots), \tag{8.6}$$

where $G_i > 0$.

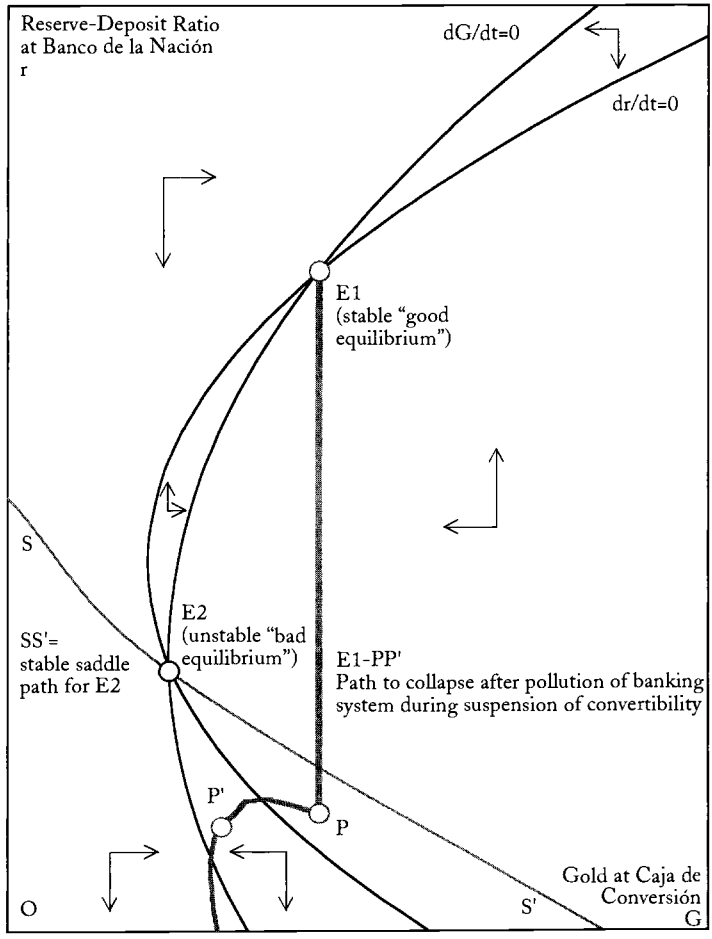
We now have a dynamical system in two variables, r and G. To figure out the nature of the dynamics we consider the multiplier again. The money multiplier m reacts to the reserve-deposit ratio r in two ways. A rise in the ratio means more use of notes by the bank as reserve, directly lowering the multiplier. It also means more confidence in the bank, lowering the currency deposit ratio $c(r)$ and increasing the multiplier via c. If the first effect dominates, then $\tilde{m}'(r) < 0$, and we will show that a stable equilibrium obtains (case one). However, if the second effect dominates an unstable equilibrium obtains, and it is clear why: when $\tilde{m}'(r) > 0$ a bank run would lower r, diminish confidence, raise c (the flight to cash), and further lower m, perpetuating the run (case two).

Next, we can look at the interest rate equation based on money demand. In case one, $i_r > 0$, and an increase in the reserve-deposit ratio by the bank tightens the money market, and lures the public back into holding money balances. In case two, $i_r < 0$, and such actions do not attract the public to money. That is, under case two, the internal convertibility problem overwhelms the system and the interest-rate defense will fail.

The above dynamics lead to a phase diagram in (G, r)-space as shown in Figure 8.3. The direction of trajectories is marked in the various regions delineated by the curves $dr/dt = 0$ and $dG/dt = 0$. The intersections of the curves are the two potential kinds of equilibria, labeled E1 and E2. The point E1 corresponds to case one and is a stable node, a "good" equilibrium. The point E2 corresponds to case two and is an unstable saddle point, a "bad" equilibrium.

A possible stable saddle path for E2 is shown as SS′ and it is important to note that this curve delineates two regions in the plane: above SS′, all paths lead to the stable equilibrium, the sink point at E1. Here, the money and

Figure 8.3. Phase Diagram for the Dynamic Model



Notes: See text.

banking regime is stable and sustainable in the long run. But below SS′ there is an unstable regime where all paths lead to collapse. Note that this will not generate a crisis in the form of a complete drain of the gold stock—an external convertibility crisis—since the dynamics of G in the unstable region are such as to take paths away from $G = 0$. Rather, it is a region in which the bank collapses—that is, an internal convertibility crisis.[16]

We think this theoretical framework is ideal for the purpose of studying the dynamics of internal and external convertibility in the Argentine case. Moreover, we conceive of the model applying in very different ways in the two periods of convertibility. We have already outlined the major developments in the banking system from 1900 to 1935 in the previous section, and, particularly, the drastic changes at the Banco de la Nación after 1914.

The Banco de la Nación was once a very conservative bank with high reserve ratios and a quasi-narrow objective, but after 1914 it increasingly became a prop to the private baking system and, as a result, its own balance sheet became polluted by the problems of the wider financial system. Reserve ratios fell and the quality of the balance sheet deteriorated. Following resumption of the gold standard in December 1927, the bank experienced a severe drain unlike anything seen before. How could a system that had once worked so well under the old prewar gold standard now fail so miserably?

Our model supplies an answer. The evidence suggests to us that during the Argentine Belle Époque prior to the First World War, the money and banking system was operating in the stable zone of the phase diagram, in the vicinity of the stable equilibrium E1, with high confidence in the regime sustained by high reserve ratios.

Evidence for this type of stable regime is supplied in Table 8.3. We have high-frequency (monthly) data on the gold stocks of the Conversion Office and the reserve and deposit holdings of the bank starting in 1908, and this permits us to estimate a locally linearized version of the model close to E1. To empirically fit the dynamical system we set up a two-equation vector autoregression (VAR) for the reserve ratio and gold stock of the form

$$\begin{pmatrix} \Delta r_t \\ \Delta \log G_t \end{pmatrix} = \alpha_0 + \sum_{s=1}^{p} \alpha_s \begin{pmatrix} r_{t-s} \\ \log G_{t-s} \end{pmatrix} + \sum_{s'=1}^{q} \beta_{s'} \begin{pmatrix} \Delta r_{t-s'} \\ \Delta \log G_{t-s'} \end{pmatrix} + \epsilon_t \quad (8.7)$$

and estimated the model using series from January 1908 to December 1913, the heyday of the classical gold standard.

16. In case one, both curves are upward sloping; the curve $dG/dt = 0$ is steeper, since the interest rate is constant on this curve for external equilibrium; on the $dr/dt = 0$ curve the interest rate is rising to the lower-left to maintain equilibrium at the bank. In case two, both curves are downward sloping; $dG/dt = 0$ is again steeper, with the interest rate constant; on $dr/dt = 0$ the interest rate is rising to the upper-left to maintain equilibrium at the bank. By inspection E1 is seen to be stable (consider, for example, any small rectangle around E1 aligned to the axes: it is a Liapunov stable set). E2 is seen to be a saddle point.

Table 8.3. *Dynamics of Internal and External Convertibility, 1908–13*

A. VAR Estimation		
Dependent Variable	Δr	$\Delta \log G$
$r(t-1)$	-0.23	0.03
	(0.08)	(0.04)
$\log G\ (t-1)$	-0.07	-0.10
	(0.07)	(0.03)
Observations	60	60
R-squared	0.14	0.46
Mean of Dependent Variable	0.00	0.00
Standard Error of Estimate	0.05	0.02
Durbin-Watson Statistic	2.20	1.77
B. Covariance Matrix of Residuals		
	0.00207	0.00009
	0.00009	0.00044
C. Stability Test		
Determinant	0.03	
Trace	-0.33	

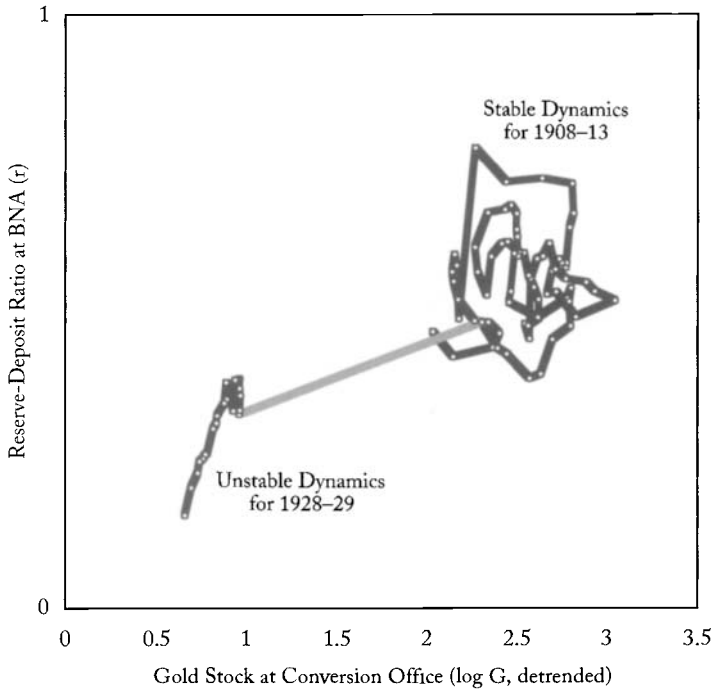
Notes and sources: See Appendix 1. Lag selection by step-down procedure. Lag of $\Delta \log G$ used in second equation, not shown. Constant terms not shown. $\log G$ is subject to preliminary detrending. See text.

After careful model selection we found some simple dynamics consistent with a stable equilibrium of the type E1, and requiring only a simple lag structure, $p = q = 1$.[17] Entries in the matrix α_1 should be negative on the diagonal, and positive off the diagonal and this hypothesis cannot be rejected.[18] Stability would also require that α_1 should have a positive determinant and negative trace, conditions that are met.

Apparently the dynamics were stable in this period, and the same impression obtains from an inspection of the time series of r and $\log G$ (the latter detrended) shown in the upper right portion of Figure 8.4. The resemblance to the stable equilibrium E1 depicted in Figure 8.3 is striking. At high levels of reserves and gold, the system was subject to shocks but remained in a neighborhood of its equilibrium. The trajectory fluctuated but it did not explode unidirectionally.[19]

17. Preliminary lag choices were made using the Schwarz criterion on univariate series. Final lag selection was made in the VAR using a step-down procedure to eliminate insignificant lags of each variable. One lag of each level variable was required, plus one lag of ΔG in the G equation. To filter out the long-run expansion of the gold stock, $\log G$ was subject to preliminary detrending.
18. One off-diagonal term has the wrong sign but is not significant.
19. Unit root tests suggest that both series are stationary in this sample period. We used the more powerful GLS variant method of the Dickey-Fuller test as introduced by Elliott, Rothenberg, and Stock (1996); the exact test we used is the DF-GLS$_u$ test of Elliott (1999). For the series r (demeaned) and $\log G$ (detrended) the test statistics were -2.42 (with a 10 percent critical value of -2.46), and -2.68 (critical value -2.41), respectively.

Figure 8.4. Reserve Ratios and Gold Stocks in Two Convertible Regimes



Notes: The series log *G* is detrended and both series are renormalized for clarity. *Sources:* See Appendix 1.

That is, the gold standard system was a stable one at the beginning of the century because it was combined with prudent inside-money practices.

This regime ended in 1914: external shocks and domestic policy choices made gradual, seemingly innocuous, changes in the institutional framework. The gold standard was suspended, albeit with the intention of resuming. The rediscount provisions of the Banco de la Nación and the Conversion Office introduced some implicit guarantees into the financial system, albeit they were intended as emergency powers. The notion of acting like a central bank became a distinct possibility, at least for the Banco de la Nación, now that some Lender-of-Last-Resort functions were authorized. The creation of these powers did increase the scope for moral hazard. To its credit, the Conversion Office kept its emergency powers largely in reserve. It was not so at the Banco de la Nación, where rediscounting grew steadily after 1914, as a narrow banking orientation gave way to expanding commercial activities.

Had the institutional framework not changed after 1914—had the gold stan-

dard rules endured at the Conversion Office and had the bank followed its high-reputation rules—then, of course, the system would have been locked into the stable dynamics for the long run. However, suspension of the prevailing institutions in 1914 caused the system to be buffeted by new political and economic pressures, allowing it to follow a new path without reference to the above dynamical system whose operation had been halted for a time. The system moved ever further from the stable equilibrium E1.

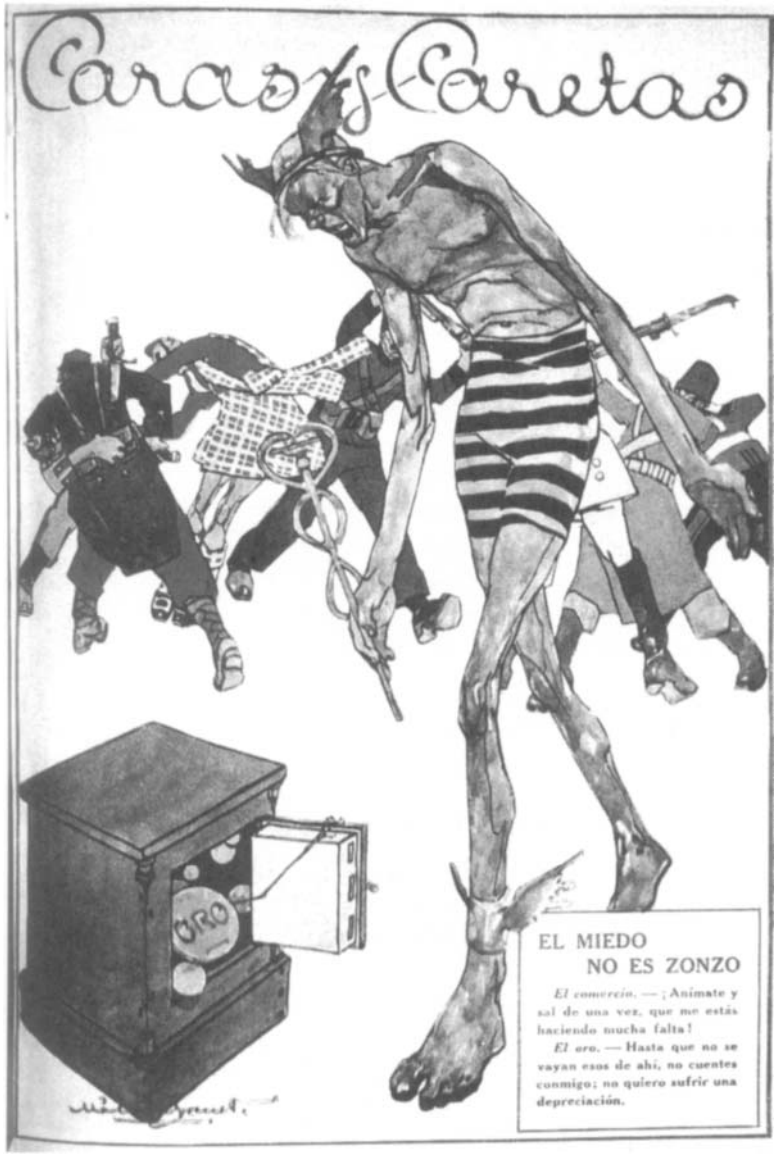
The pollution of the balance sheet of the Banco de la Nación from 1914 to 1927 is represented in Figure 8.3 by the line E1-P. Outside money was in good health, gold stocks in the Conversion Office held firm or even rose, and G did not drop. At the same time, inside money fell into very poor health as the reserve ratio r declined sharply. Thus, we argue, the system arrived at a point like P by the late 1920s. The system could "safely" cross into the unstable region of the phase diagram during the years of suspension, since the dynamics of the model were held in check and the tensions kept at bay.

Yet the institutional pollution of the banking sector, while not a cause for serious concern in the relatively controlled environment of 1914–27, could potentially unleash a dramatic crisis once the full open-economy gold-standard dynamics were set in motion again. Resumption had always been the authorities' intent along the way, despite their tolerance for the dangerous inconsistencies emerging between inside and outside money in the interim. The dynamical system set to work again during the brief 1927–29 resumption, but this time, we conjecture, from new initial conditions at a point like P, with movement along a path like PP′.

How would the system behave in this new region according to theory? Initially, but not for long, the banking system might appear healthy with a slight increase in reserve ratios (r rising), even as gold losses set in (G falling). Yet, eventually, an internal drain would inevitably arise (to the left of the $dr/dt = 0$ curve). The system would head toward collapse on the horizontal axis at P′, unless the dynamics were terminated by some form of institutional change. Either there could be a suspension of internal convertibility such as a bank closure, failure, or "holiday"; or, there could be a suspension of external convertibility, as actually happened when Argentina left the gold standard for good in December 1929.

We have insufficient monthly data to estimate a VAR for this brief period, so we cannot subject the system to the same kinds of tests we did in Table 8.3 for the pre-1914 regime.[20] However, unit root tests confirm an explosive path for r

20. We also note that a VAR might be inappropriate in its linear specification for describing a path like PP′ that lies so far from the equilibrium E2 where a linear approximation might be valid. So it was no surprise that when we did estimate a VAR it did not fit well: we did find unstable saddle characteristics, but with signs that did not conform exactly to the prescriptions of the partial derivatives of the model.



Cartoon 8.2. *El miedo no es zonzo. El comercio — ¡Animate y sal de una vez, que me estás haciendo mucha falta! El oro — Hasta que no se vayan esos de ahi, no cuentes conmigo; no quiero sufrir una depreciación.* (Fear is not stupid. Business — Get moving and get out now, I badly need you! Gold — As long as they [the combatants of the First World War] are still here, don't count on me; I don't want to suffer a depreciation.)
Notes: One month after the outbreak of the First World War, convertibility has been suspended. Business wants liquidity, but under the orthodoxy of the currency board, there is no relief forthcoming: there could be no attempt to expand monetary policy.
Source: Caras y caretas, no. 835, September 26, 1914.

and log G in this period, with both collapsing, and a cursory inspection of the trajectory in the lower left portion of Figure 8.4 illustrates a trajectory much like the putative path PP′ shown in Figure 8.3. Again, the correspondence between the empirical trajectories and the phase diagram is striking.

To sum up, during the Belle Époque era before 1914, a credible currency board and a quasi-narrow state bank avoided any clash between internal and external convertibility, making the provision of each that much more secure. An external shock, internal economic problems, and new political directions after 1914 allowed for some seemingly innocent tinkering with this supposedly solid institutional design. On the surface, the system that existed in 1927–29 did look, to all intents and purposes, very much like the one that had worked so well up to 1913. But certain crucial elements had been allowed to change, and the banking sector, including the state bank, had fallen into very poor shape.

Agents clearly knew this, and when the gold window opened there commenced a massive internal drain (a run on bank deposits) which fed an equally massive external drain (a run on gold at the currency board). The drain was halted by the Conversion Office going off gold after an embarrassingly brief resumption.[21] Outside money was hit hard: gold losses were large, about 40 percent below trend in two years. Inside money was devastated: the Banco de la Nación was now in the same parlous state as the private banks, with a reserve ratio falling about 20 percentage points toward a feeble 10 percent level.[22]

Inconvertible Again: Costs and Benefits

The suspension of convertibility brought both costs and benefits for Argentina. On the upside, a new freedom in monetary policy allowed domestic prices to be delinked from a deflationary global scenario that was to drag many other economies into much deeper depressions. However, as we shall see in the next chapter, this monetary policy freedom was not automatic and faced several institutional hurdles and required some explicit choices to be made about reputation and credibility in the fiscal-monetary nexus.

In a nutshell, Argentina still had to export gold to service debt, but this would mean severe monetary contraction. The choice was either to default on external loans or offset the monetary contraction by printing unbacked notes. Invoking emergency conditions, a sterilization policy was implemented, and a stable price level and money stock were more or less maintained. As we shall

21. Had the conversion office not suspended, the internal drain could have continued to feed the external drain and this could have precipitated a speculative attack and a collapse of the exchange rate regime. See Miller (1996).

22. See Figure 8.2 for these trends. The reserve ratio was disastrously low: for some perspective, we should recall that, as bad as the run on the banks had been in the Baring Crisis, the reserve ratio at the private banks (including the then Banco Nacional) never fell below 22 percent in 1890–91. See Table 3.1.

see in the next chapter, such actions successfully steered Argentina away from a severe recession.

On the downside, the exchange rate was soon floating far from parity after such a change of regime. Put another way, the paper peso price of gold soared. Valued at the market rate, the government's gold reserve was expanding in paper terms. It could have been very tempting to imagine uses for these sudden seigniorage profits, and the policymakers of the time did not lack imagination.

Most worryingly, the costly financial sector debacle was not over. The suspension of 1929 had resolved the tensions in the system by halting the prevailing rules of the game so as to end the unstable dynamics; but it left a much larger problem to be resolved in the longer run. What could be done with a financial system that was on the verge of ruin? Who would bear the costs of fixing the damage? And how big were those costs going to be? We take up this story again when we discuss the formation of the central bank and the extraordinary use of vast seigniorage resources to benefit a privileged few by bailing out the very large fraction of rotten assets that had accumulated on the balance sheets of the nation's private banks.