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Internal Versus External Convertibility and Emerging-Market Crises: Lessons from Argentine History

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Abstract

Argentina's money and banking system was hit hard by the Great Depression. Banks were awash with bad assets when Gold convertibility was suspended in December 1929. We argue for an explanation of the crisis that focuses on the inside-outside money relationship in a system of fractional-reserve banking and gold-standard rules with a tension between internal and external convertibility. After financial fragility appeared in the 1914–27 suspension, resumption in 1928 was probably unsustainable due to the problems of the financial system, and a dynamic model illustrates the point well. When the state bank became insolvent, the currency board started bailing out the system using high-powered money. Thus came about the demise of the currency board and the creation of a central bank in 1935. As one of its first substantive actions, the central bank engineered a bailout of the banking system at a massive social cost. The parallels with recent developing-country crises are remarkable, and the implications for the institutional design of monetary and banking systems are considered.

Key words: Argentina, interwar period, economic history, money and banking macroeconomic policy, gold standard, convertibility, banking crisis.
JEL: E42, E51, E53, E58, E65, F33, F36, G21, N16, N26.

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1. 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 (Kaminsky and Reinhart 1999). 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 that crisis and were under study as possible models for more robust designs in other countries, yet Argentina's plan ultimately failed. Can these schemes be a basis for a monetary and financial design that will function well in this kind of global economic environment? Whilst a glance at the contemporary scene raises many questions, 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 distant ancestors in the turbulent inter-war economy. More importantly, we find that the

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[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 to 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).

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

To quickly summarize the Argentine historical experience, World War I marked a major turning point in Argentina's adherence to a credible and disciplined money-banking regime. There was general success from the 1890s until 1914. The system functioned smoothly and adhered to rules designed to protect a high reputation and maintain credibility under a conservative or quasi-narrow state bank and a rigid currency-board regime. Subsequently, the money and banking authorities, supported by policymakers and politicians, chose a different path. The state bank became broader in scope, assumed a lender-of-last-resort function it could not sustain without subsidy, and ultimately dragged the currency board into a scheme to bail out the state bank and its ailing dependents, the private banks. Eventually, a central bank was created in 1935 to assume responsibility for cleaning up the mess and to take over all monetary responsibilities from the currency board. [2]

If we are to analyze this historical episode from a theoretical perspective, we need 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 the recent crises, scholars have turned their attention to the problem of the twin crises—that is, the internal and external convertibility problem. This literature draws on ideas found in some vintage papers in the literature, notably the work of Díaz Alejandro. [4] In that same spirit, we draw on an older and unduly neglected model of the money-banking nexus by Dornbusch and Frenkel (1984), henceforth DF. [5]

This model was developed for an episode that sits even deeper in historical memory, its aim being to explain the short-run macroeconomic dynamics under a gold

[2] The 1930s and 1940s are considered key decades in Argentine economic history, when an outward-oriented, pro-trade, stable-price, liberal economic regime gradually gave way to an inward-looking, protectionist, inflationary, state-led regime (Díaz Alejandro 1970). No small part of the transition was the shift in money and banking policies. The constraints on the banking-sector in a state-led environment set the stage for financial repression, and the participation of the financial sector in a broader *dirigiste* plan. The effects of such "financial repression" revealed the importance of a healthy system of intermediation for economic development (Gurley and Shaw 1955; Shaw 1973; McKinnon 1973; Fry 1995; Roubini and Sala-i-Martin 1992; De Gregorio and Guidotti 1995).

[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] In a recent important contribution, Miller (1996) refines and expands the DF model, incorporating a Krugman-style approach to a speculative attack and forward-looking expectations.

standard regime and the operations of the Bank of England during 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 DF 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*). The model 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 threatens 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.

We think the applicability of the DF model to the Argentine situation in the years 1900–35 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.

In the context of recent interest in banking crises, the originality in our paper involves more than simply the dusting off of an older model. In particular, we extend the theory by characterizing more completely conditions under which multiple equilibria obtain, and in our historical analysis we employ econometric techniques to identify both stable and unstable cases. In the broader context of historical accounts of the inter-war slump at the periphery, ours is a new story— an analytic narrative that explores the interaction of institutional design and dynamic macroeconomic processes, with an emphasis on the potential for "good" institutions to slide subtly into "bad" institutions, leading to a dramatic *dénouement* and a costly cleanup. For contemporary policymakers facing similar constraints these lessons are highly relevant.

What are the implications of our analysis? At one level, there are general implications for the study of the inter-war period and the demise of the gold standard. 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] On another level,

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[6] Some reference works on the inter-war period and its long-run context are Eichengreen and Sachs (1985); Eichengreen (1992a; 1992b; 1996); Temin (1989). The quoted phrase is

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—not banking deposits, the main component of inside money. In the event of a crisis of confidence, such as a banking panic, the system might end up being governed by the dynamics of a bad (unstable) equilibrium from which there is no escape (Diamond and Dybvig 1983). Such dynamics would destroy internal and external convertibility alike, taking down the institutions of both—the currency board and the banks—with them. To sum up, a strong and credible currency board may offer 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. [7]

2.   The Argentine Banking Environment and its Evolution

Argentina's early monetary history is notable for the predominant role of its official banks, institutions founded and patronized by the state, at the level of both the federal government and the country's provinces. These banks usually acted as fiscal and financial agents for the corresponding administrations. This same banking structure had caused great turmoil in the early years of the republic. From 1822 to 1881 banks in Argentina were noted for their erratic and ephemeral existence, and their exaggerated use of inflationary note issue in the provision of cheap credit to finance federal and state administrations. [8]

Temin's.

[7] 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).

[8] The first private bank to be founded, the Banco de Descuentos (1822), for example, was obliged to offer funds to the Legislature of the Province of Buenos Aires, and was "provincialized" and merged with the (first) Banco Nacional in 1826. This bank, in turn, was dissolved in 1836 during the Rosas administration in order to create the Casa de Moneda (the Mint) which was then dissolved in 1852 so that the Bank of the Province of Buenos Aires could be created in 1854. In 1872, the (second) Banco Nacional was founded as a mixed entity operating until 1891. In 1892 this bank was refounded as the (third) Banco de

In 1881 the administration of President Julio Roca (1880–86) established a bimetallic monetary standard. The power to issue paper pesos was granted to numerous existing banks that were supposed to guarantee the convertibility of their notes into gold pesos at all times. This decentralized system for issuing currency was very fragile because there was no comprehensive and transparent monetary regulation. For example, there was no rule that defined the degree of metallic backing that the banks should have on hand to guarantee the convertibility of their notes. The system, initiated in 1883, lasted only until early 1885. By 1887, the promise to convert bank notes into gold pesos at par had been abandoned and the government set up a new system of national guaranteed banks authorized to issue paper money guaranteed by metallic backing. In 1890 this abortive experiment provoked the famous financial collapse known as the Baring crisis, which led to the resignation of Argentina's president at the time, Miguel Juarez Celman (1886–90), and the succession of Carlos Pellegrini (1890–92). [9]

After the catastrophic crisis in 1890–91 the Pellegrini government took great care in designing a new regime to replace the fragile decentralized system. 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 and flourish in the emerging global economy of the time. 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 a new Conversion Office, the Caja de Conversión. 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 in 1892.

The two institutions were kept at arm's length so as effectively to isolate two functions. The note issue responsibilities, ultimately to be backed by gold and foreign exchange once convertibility was resumed—that is, outside money and, eventually, external convertibility—were to be the sole task of the Conversion Office. The state and commercial banking activities—that is, inside money and the task of internal convertibility—were the domain of the Banco de la Nación and the private financial system. It was hoped that this isolation would constitute a more robust and credible regime by keeping inflationary pressures and banking activity separate from the institution that was ultimately responsible for the currency.

The new state bank had multiple roles as a big commercial bank, a development bank, and the financial agent of the state. A new charter was put in place governing bank reserves at the Banco de la Nación to limit its rediscounting capacity. Despite being "too big to fail," and susceptible to the moral hazard risks that attach to any banking institution with implicit state guarantees, the Banco de la Nación maintained a clean balance sheet in the period of recovery and smooth economic growth from 1892 to 1913 (Table 1). As a fraction of overall banking activity, its use of rediscounts was small even after a relaxation of banking laws in 1904; non-performing loans were few; leverage was not excessive and there appeared to be adequate capital on the balance sheet (Figure 1). The reserve-deposit ratios stayed very high, well over

la Nación, a state-owned commercial bank. See della Paolera and Ortiz (1995).
[9] For more discussion of this period see della Paolera (1988).

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Fig. 1. Rediscounts, Nonperforming Loans, and Capital as a Fraction of Loans
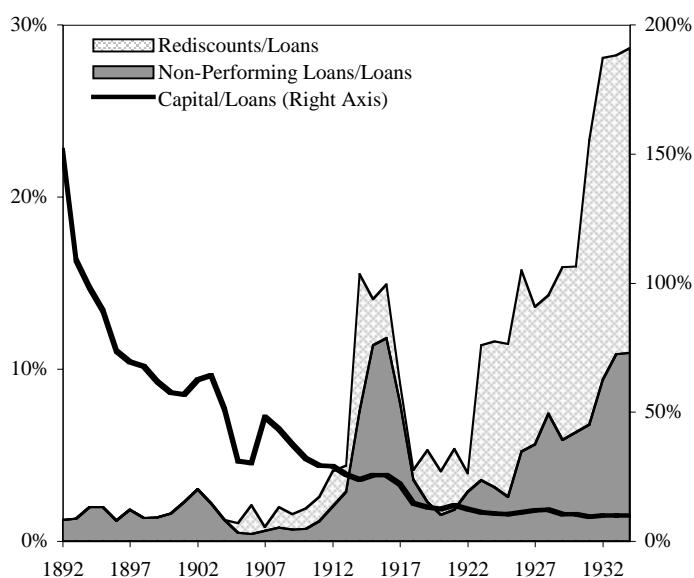
Notes and Sources: See Table 1.

50 percent in most years before the war (Figure 2).

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 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, non-performing loans rose, and the capitalization level of the bank sank. We can estimate how much of a difference the rediscount activity made to bank balance sheets by considering a counterfactual. 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 swap, that is, with cash reserves equal to the rediscounts added to the Banco de la Nación's portfolio, and subtracted from the private banks' portfolios. The results of this exercise can be seen in Figure 2. Absent the rediscount provision, the private banks would have seen their reserve-deposit ratio fall from 14 percent to 6 percent in 1914. This situation did abate when the Argentine economy recovered after 1914, but further deterioration in balance sheets came about in the 1920s. Even with rediscounts, private banks saw

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Table 1
Banco de la Nación, Balance Sheet Items, 1892–1934

	Loans				Banking Reserves			Liabilities		Ratios to Loans		
	Total	Re-disc.	To Gov.	Non-perf.	Total	Gold	Paper	Cap-ital	Dep-osits	Re-disc.	Non-perf.	Cap-ital
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. Before 1905, capital is book value.
*Sources*: della Paolera (1988, Appendix) and balance sheets of Banco de la Nación.

Table 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 1. Other banks includes Banco de la Provincia de Buenos Aires, also partly state-owned, and all domestic and foreign private banks.

Fig. 2. Reserve-Deposit Ratios, Actual (With Rediscounts) and Counterfactual (Without)
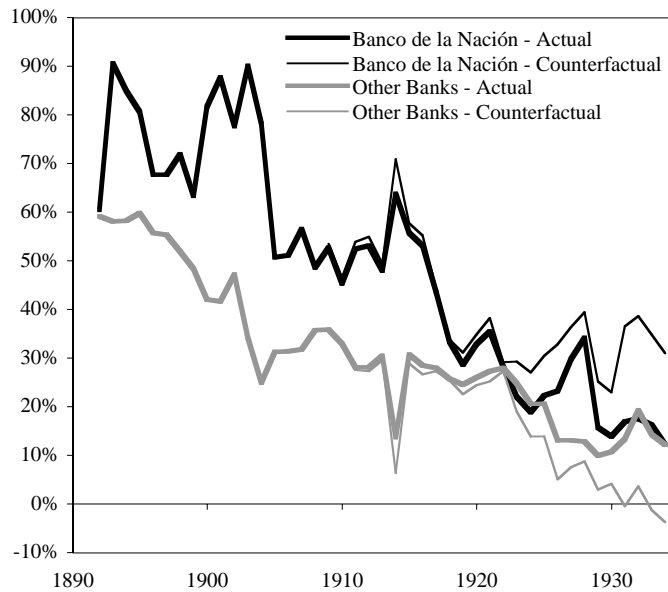
Notes and Sources: See Table 1.

reserve ratios slide from around 25 percent in 1920 to about 10 percent in 1930. The counterfactual liquidity calculation hints that, without the actions of the Banco de la Nación, the private banks would have failed sometime in the early 1930s. This simple exercise suggests that the rediscount law as it applied to the Banco de la Nación helped a wounded banking system limp along for many years in the inter-war period.

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 whether this institutional arrangement sufficed to produce a stable financial environment. Either through choice or neglect, the authorities of the 1892–1914 period were optimistic 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 arrogated these powers in an *ad*

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

hoc fashion. Why was the rediscount law enacted? And why did the Banco de la Nación take on the risks associated with rediscounting to private banks with weak collateral?

It is easy to identify one group that gained from the new policy. The state bank's rediscounting provided a bailout to the private banks once, *ex post*, it became clear to them that their balance sheets were in a bad state. In essence, the private banks 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 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.

These activities give the distinct impression of corrupt banking operations and probably would not have occurred under a careful system of regulation and supervision.[11] Contemporary parallels cannot be avoided here. Foreign investors had long been aware of the seamy side of Argentine finance, and what in Asia today has been dubbed "crony capitalism" was in the Argentina of yesteryear disparagingly referred to as "Gaucho banking" by the horrified Anglo-Saxon observers of that time:

> [Argentine banks] were free banks in the freest sense of the term, for any Gaucho who had the political open sesame to them could ask for almost anything he pleased, and it would be given him so long as there was a piastre left in the till.[12]

We do not know what incentives the private banks used to secure their bailouts, but get them they did—in two forms. The Banco de la Nación from 1914 to 1935 did what it could through rediscounts to keep the private banks out of an illiquidity crisis and stave off a total financial collapse. 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.

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, unknown to the state bank. There was a "market for lemons" problem in the use of loans as collateral whereby private banks had an incentive to use as collateral the worst paper they held.[13] This problem of

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[11] 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.

[12] These words from the English financial correspondent W. R. Lawson in his article "Gaucho banking" in the *Banker's Magazine* of 1891 (p. 38), quoted in Ford (1962, p. 100).

[13] On the "lemons" problem, see Akerlof (1970).

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 whilst 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 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, initiated by the central bank after 1935, generating decades 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 shrouded.

3. A Model of Fractional Banks in a Gold Standard Regime

There were widening tensions during the 1920s between the goals of external and internal convertibility in the Argentine case. During the 1914–27 gold standard suspension Argentina allowed the peso to float, keeping open the options for capital mobility and an activist monetary policy. The activist monetary policy could obviously not emanate from the Conversion Office, which held to its mandate to match note issues by gold on the margin. However, the Banco de la Nación started to engage in large rediscount operations, setting a lending rate to the other private banks, a nominal policy target. Upon resumption of the gold standard, however, the Conversion Office would be aiming to set the exchange rate—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 arose from a fractional reserve system that allowed agents to convert deposits into cash on demand. The problem is that such a system might not be sustainable in the event of a confidence crisis—for example, after one or more sufficiently bad shocks 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.

During the 1900–14 and 1927–29 gold standard regimes, we believe that agents perceived an implicit unified balance sheet of the two state institutions, the Conver-

Table 3
Balance Sheets at the State Bank and Currency Board

Banco de la Nación		Caja de Conversión	
Assets	Liabilities	Assets	Liabilities
Reserves (R)	Private deposits (D)	Gold (S)	Notes (H)
Loans (L)	Public deposits (D')	Securities (S)	

sion 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 other. We model these dynamics using a dual-equilibrium extension of the Dornbusch-Frenkel (1984) approach.

The Model

Consider the balance sheets of the two financial entities (Figure 3). The Conversion Office has a balance sheet that consists of liabilities in the form of circulating notes H (high-powered money or monetary base), and assets comprised of gold G and securities S. By assumption, $H = G + S$. 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, as in standard monetary theory, it is easy to verify that,

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

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 $c = (H - R)/D$ is the currency-to-private-deposit ratio of the (non-bank) 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. [14]

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 $c' < 0$. Note that this

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[14] 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.

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relationship takes the bank's behavior as given and describes only how the public reacts to the one signal, assumed to be known by all agents, describing the bank's balance sheet, the ratio r. Furthermore, the reaction is myopic: agents only care about the state of the bank today when they make their optimal cash versus deposit choice.

Given the public's choice of c, we can then write broad money M as

$$M = \tilde{m}(r)(G + S),\tag{2}$$

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

An important feature captured here is that the public's response cannot be signed for sure: the relationship of the multiplier to the reserve-to-total-deposit ratio r is ambiguous and the cases $\tilde{m}'(r) < 0$ and $\tilde{m}'(r) > 0$ are both possible. We will make what we think is an intuitive mapping between this derivative and the reserve level, following Dornbusch and Frenkel. In the usual case, when bank reserves $r > r_1$ are adequate, we shall assume that $\tilde{m}'(r) < 0$, so that confidence effects, operating via $c(r)$, are not dominant. But when bank reserves $r < r_1$ are sufficiently small we shall assume that the public gets nervous, their currency holdings react more acutely to the reserve level, $\tilde{m}'(r) > 0$, and confidence effects dominate.

Money-market equilibrium will generate an equilibrium interest rate such that

$$\tilde{m}(r)(G + S) = L(i, y),\tag{3}$$

where $L_i < 0, L_y > 0$. The model is purely a short-run model of crisis in the money and banking sector, and is not a model of the real economy. Accordingly, it is assumed that output y remains exogenous in the short run, though real shocks could obviously perturb the system too over longer horizons. We can now solve for the interest rate

$$i = i(r, G; \ldots),\tag{4}$$

using the implicit function theorem. Clearly, $i_G < 0$; but the sign of i_r is ambiguous, because it is of the opposite sign to $\tilde{m}'(r) < 0$, and the latter is ambiguous because of the confidence problem.

Dynamics complete the model as follows. Under normal conditions, 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

$$\dot{r} = \nu(\tilde{r}(i) - r) + \nu\phi(r),\tag{5}$$

where $\tilde{r}' < 0$ and $\nu > 0$ is an adjustment-speed parameter; the term $\phi(r)$ is absent in the DF model, and here it is assumed to be zero for $r > r_2 > 0$. However,

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when reserves fall to dangerously low levels $r < r_2$ we assume that $\phi(r)$ might be nonzero, and additional lending motives start to operate. The explicit inclusion of these additional dynamics is necessary to fully capture the essence of a multiple equilibrium solution.

We can imagine two possible ways in which the term $\phi(r)$ could operate. The first has $\phi(r) > 0$, $\phi'(r) < 0$, and $\phi''(r) > 0$ for $r < r_2$; we might call this the conventional "credit crunch" dynamic, since as reserves get precariously low the bank tightens credit, scrambling to liquidate loans and prop up r. But there is another possibility, with $\phi(r) < 0$, $\phi'(r) > 0$, and $\phi''(r) < 0$ for $r < r_2$; in this case the bank *loosens* credit as reserves tumble; this we call the "crony bailout" dynamic, where the state bank chooses to sacrifice its own balance sheet to keep others afloat. We presume that, in this case, declines in the bank's reserve ratio r are symptomatic of wider financial distress, stepping up the lobbying pressure for bailouts of the private banks through the rediscount window. As our earlier description suggests, the latter case might be the relevant one for ill-disciplined emerging-market scenarios, such as inter-war Argentina. The *ad hoc* lender-of-last-resort activities of the state bank, designed to keep private banks from failing, are just the kind of cronyism we have in mind here.

Finally, the model is completed by specifying dynamics for the gold stock. Following Dornbush and Frenkel (1984, 243–44), we assume gold flows are not (or, at least, not entirely) driven by the trade balance in the manner of David Hume's price-specie-flow mechanism. Indeed, in this short-run model there is no real adjustment. Rather, we appeal to John Stuart Mill's view of the gold adjustment process as being driven in large part by capital flows. 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,

$$\dot{G} = G(i - i^*; \ldots), \tag{6}$$

where $G_i > 0$.

A Variety of Steady-State Equilibria and Local Dynamics

We now have a dynamical system in two variables, r and G, which may be written $\dot{x} = F(x)$, with reference to vector coordinates $x = (G, r)$. This system can be analyzed by examining the steady-state equilibria and their local dynamics. In the neigborhood of a steady state x^*, where local coordinates are $z = x - x^*$, the dynamics take the form $\dot{z} = Mz$ where

$$M = \left. \frac{\partial F}{\partial x} \right|_{x^*} = \begin{pmatrix} G_i i_G & G_i i_r \\ v\tilde{r}' i_G & v(\tilde{r}' i_r - 1) + v\phi' \end{pmatrix} \tag{7}$$

As is customary, we can examine the layout of trajectories close to the equilibria by finding the lines $\dot{r} = 0$ and $\dot{G} = 0$. From the expression for M, it is clear that in

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(G, r) space the slopes of these lines are given by

$$\left.\frac{dr}{dG}\right|_{\dot{G}=0} = \frac{-i_G}{i_r}, \qquad \left.\frac{dr}{dG}\right|_{\dot{r}=0} = \frac{-i_G}{i_r + a(1 - \phi')}, \tag{8}$$
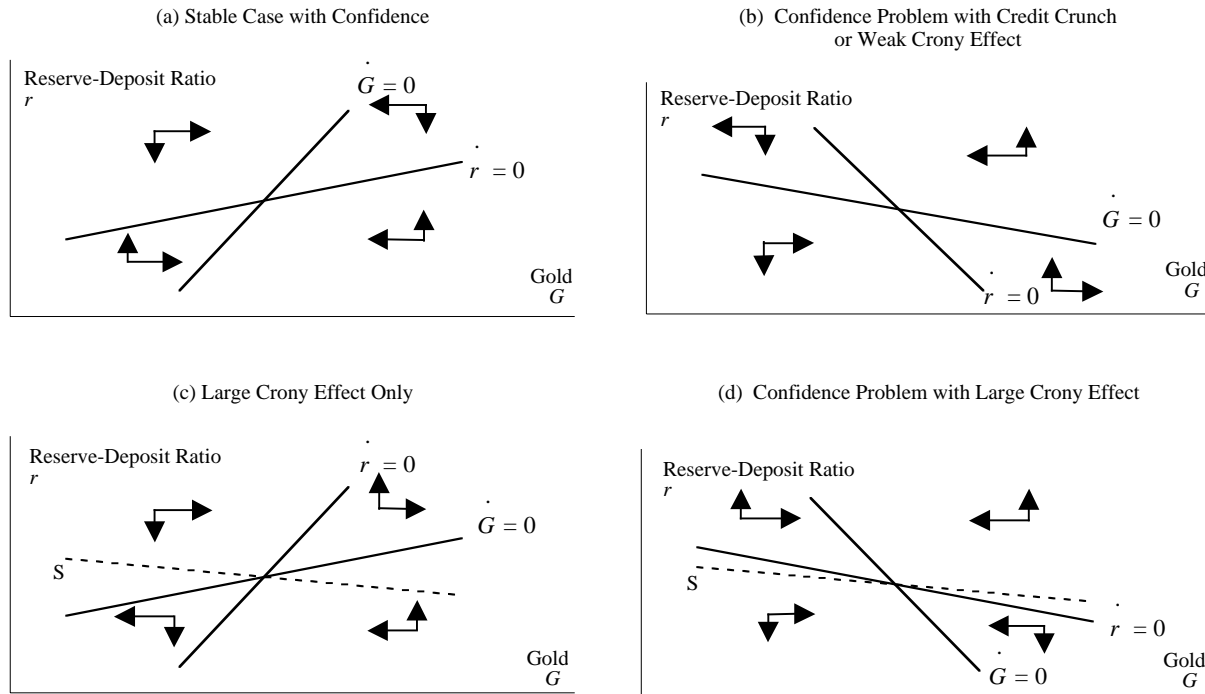
where $a = -1/\tilde{r}'(i^*) > 0$. [15] It is now clear how there might arise multiple equilibria, each characterized by different local dynamic properties.

(1) *Normal Conditions—High Reserves and a Stable Equilibrium:* Assume that reserve ratios $r > r_0 = \max(r_1, r_2)$ are sufficiently high. Under these conditions, the standard DF model applies, and there is "confidence" in the agents. For the public this means that the money multiplier is a decreasing function of reserves, $\tilde{m}'(r) < 0$, and hence $i_r > 0$ at equation 4. Here, an increase in the reserve-deposit ratio by the bank tightens the money market, and lures the public back into holding money balances. For the bank, nothing besides profit motives affect leverage choice and $\phi(r) = 0$. Since $i_G > 0$, it is clear from equation 8 that $\dot{G} = 0$ and $\dot{r} = 0$ both slope up, and the former is steeper, as in Figure 3(a). The arrows then show the local dynamics, and this "good" equilibrium is clearly a stable node.

(2) *Financial Fragility—Low Reserves and Potentially Unstable Equilibria:* Assume conversely that reserve ratios $r < r_0$ are sufficiently low. There are three destabilizing possibilities: a "confidence" problem, a "crony bailout" problem, and both. We discuss each in turn.

  (a) *Confidence Problems and Weak or Absent Cronyism:* Under these conditions, there are confidence problems. For the public this means that the money multiplier is an increasing function of reserves, $\tilde{m}'(r) > 0$, and hence $i_r < 0$. Here, a decrease in the reserve-deposit ratio by the bank tightens the money market: the confidence problem dominates, and agents flee to cash. For the bank, under low reserves either a "credit crunch" operates, $\phi'(r) < 0$, or, at worst, a weak crony effect, $\phi'(r) < 1$. It is then clear from equation 8 that $\dot{G} = 0$ and $\dot{r} = 0$ both slope down, and the latter is steeper, as in Figure 3(b). The arrows show that the steady state is a focus, stable or unstable depending on the parameter values. [16]

  (b) *Large Crony Problem and No Confidence Problems:* As in the stable case, there are no "confidence" problems, so $\tilde{m}'(r) < 0$, and hence $i_r > 0$. For the bank, the "crony bailout" forces operate and $\phi'(r) > 0$. We assume now that this crony effect is sufficiently large, $\phi'(r) > 1$. It is clear from

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[15] The derivation follows from differentiating the equation $F(x) = 0$. Thus, on the line $\dot{G} = 0$, $G_i i_G dG + G_i i_r dr = 0$. On the line $\dot{r} = 0$, $v\tilde{r}' i_G dG + v(\tilde{r}' i_r - 1 + \phi')) dr = 0$. Rearranging yields the slopes given in the text.

[16] This result motivates our exploration of an augmented model. As we shall see very shortly, without the addition of the "crony bailout" mechanism, or some other forces, the unstable saddle-point equilibrium described by Dornbusch and Frenkel (1984, 258–59) cannot exist. Specifically, $\dot{G} = 0$ cannot be downward sloping and steeper than $\dot{r} = 0$ as drawn in their Figure 5.9. Hence, only equilibria of the type (a) or (b) in Figure 3 can exist in their formulation, neither of them a saddle point.

Fig. 3. Stable and Unstable Equilibria

(a) Stable Case with Confidence

Reserve-Deposit Ratio
r

$\dot{G} = 0$

$\dot{r} = 0$

Gold
G

(b) Confidence Problem with Credit Crunch
or Weak Crony Effect

Reserve-Deposit Ratio
r

$\dot{G} = 0$

Gold
G

$\dot{r} = 0$

(c) Large Crony Effect Only

Reserve-Deposit Ratio
r

$\dot{r} = 0$

$\dot{G} = 0$

S

Gold
G

(d) Confidence Problem with Large Crony Effect

Reserve-Deposit Ratio
r

S

$\dot{r} = 0$

Gold
G

$\dot{G} = 0$

Notes: See text. S denotes the saddle path, for illustration only. The equilibria are as follows: Case (a): $\tilde{m}'(r) > 0$, $\phi'(r) < 1$; a stable node. Case (b): $\tilde{m}'(r) < 0$, $\phi'(r) < 1$; a stable or unstable focus. Case (c): $\tilde{m}'(r) > 0$, $\phi'(r) > 1$; a saddle. Case (d): $\tilde{m}'(r) < 0$, $\phi'(r) > 1$; a saddle.

equation 8 that $\dot{G} = 0$ now slopes up and $\dot{r} = 0$ is steeper (or even negatively sloped when $\phi'(r) > 1 + i_r/a$), as in Figure 3(c). The arrows show that the steady state is a saddle point.

(c) *Confidence Problems and Large Crony Problems:* Here both of the abnormal forces operate. Confidence problems imply $\tilde{m}'(r) > 0$, and hence $i_r < 0$. A large crony effect has $\phi'(r) > 1$. It is clear from equation 8 that $\dot{G} = 0$ now slopes down and $\dot{r} = 0$ is flatter (or even positively sloped when $\phi'(r) > 1 + i_r/a$), as in Figure 3(d). The arrows show that again the steady state is a saddle point.

This completes our taxonomy of what turns out to be a rich set of dynamics. With this augmented DF theory in place, we now ask the crucial question: how well does our theory map into reality?

Plausible Global Dynamics

During tough times the state bank's relations with the private sector were driven more by the mentality of the soft-budget constraint than by a hard-nosed threat of credit crunch. There were also likely confidence problems as the public watched banks flirt with illiquidity. Accordingly we lean towards the saddle-point dynamics in Figures 3(c) or (d) as the appropriate model for a gold standard resumption in the harsh environment of the 1920s. Conversely, we see Figure 3(a) as the likely characterization of macroeconomic dynamics in the trouble-free years of the 1900–14 golden age.

With the above equilibria in mind, the full dynamical system can be displayed once we set out the complete phase diagram in (G, r)-space, as shown in Figure 4. 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, with a high reserve level, corresponds to Figure 3(a) and is a stable node, a "good" equilibrium. The point E2, with a low reserve level, corresponds to Figures 3(c) or (d) 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 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 is the real threat.

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. Once a very conservative bank with high reserve

Fig. 4. Phase Diagram for the Dynamic Model
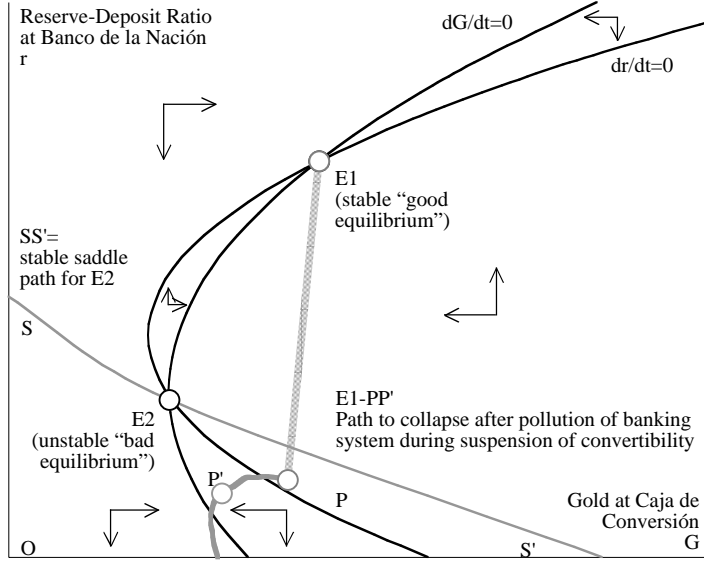
Notes: See text.

ratios and a quasi-narrow objective, after 1914 it increasingly became a prop to the private banking 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 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?

Empirical Evidence

Our model supplies an answer. The evidence suggests to us that during the Argentine *Belle Époque* prior to World War I, 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 the left two columns of Table 4. 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. To fit the dynamical system empirically we set up a two-equation vector autoregression (VAR) for the reserve ratio and gold stock of the form

$$\begin{pmatrix} \Delta r_t \\ \Delta \log G_t \end{pmatrix} = \alpha_0 + \sum_{s=1}^{p} \alpha_s \begin{pmatrix} r_{t-s} \\ \log G_{t-s} \end{pmatrix} + \sum_{s'=1}^{q} \beta_{s'} \begin{pmatrix} \Delta r_{t-s'} \\ \Delta \log G_{t-s'} \end{pmatrix} + \epsilon_t \quad (9)$$

and estimated the model using series from January 1908 to December 1913, the heyday of the classical gold standard. We found some simple dynamics consistent with a stable equilibrium of the type E1, and requiring only a rudimentary lag struc-

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Table 4

Dynamics of Internal and External Convertibility in Two Convertible Regimes

	Jan. 1908–Jan.1913		Aug. 1927–Nov. 1929	
A. VAR Estimation				
Dependent Variable	$\Delta \log G$	Δr	$\Delta \log G$	Δr
$\log G(t-1)$	-0.10	-0.07	0.11	0.20
	(0.03)	(0.07)	(0.03)	(0.06)
$r(t-1)$	0.07	-0.23	-0.05	-0.25
	(0.05)	(0.08)	(0.05)	(0.09)
Observations	60	60	28	28
R^2	0.12	0.14	0.34	0.41
Mean of Dep. Variable	0.00303	0.00081	-0.01075	-0.00084
Std. Err. of Estimate	0.02	0.05	0.01	0.02
Durbin-Watson	1.77	2.20	2.25	2.49
B. Covariance Matrix of Residuals				
	0.00071	0.00009	0.00014	0.00003
	0.00009	0.00206	0.00003	0.00032
C. Stability Test				
Determinant	0.03		-0.02	
Trace	-0.33		-0.13	
$\text{Trace}^2 - 4 \text{ Determinant}$	0.00		0.09	

Notes: See text. Lag selection by step-down procedure. Lag of $\Delta \log G$ used in first column, not shown. Constant terms not shown. $\log G$ subject to preliminary detrending, 1908–35.
Source: Baiocco (1937).

ture, $p = q = 1$. [17] Entries in the matrix α_1 should be negative on the diagonal and positive off the diagonal, and this hypothesis cannot be rejected. One off-diagonal term has the wrong sign but is not significant. Stability would also require that α_1 should have a positive determinant and negative trace, conditions that are met, and the third stability test ensures real eigenvalues. We find this persuasive evidence that E1 is an equilibrium of the type shown in Figure 3(a), and it is drawn thus.

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 5. The resemblance to the stable equilibrium E1 depicted in Figure 4 is striking. At high levels of reserves and gold, the system was subject to shocks but the system remained in one neighborhood, suggesting an equilibrium. The trajectory fluctuated but it did not explode unidirectionally. [18] The

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[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 over 1908–35.

[18] 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

Fig. 5. Reserve-Deposit Ratios at Banco de la Nación and Gold Stocks at Conversion Office in Two Convertible Regimes
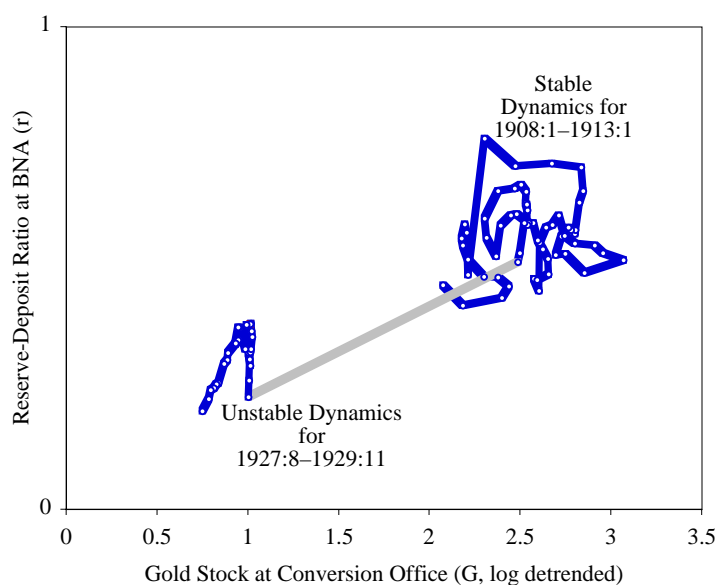
Notes: log *G* is detrended. *Source*: Baiocco (1937).

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, although they were only 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 standard 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 4 by the line E1-P. Outside money was in good health, gold stocks in the Conversion Office held firm relative to trend. At the same time, inside

percent critical value of −2.46), and −2.68 (critical value −2.41), respectively.

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money expanded 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.

Yet the institutional pollution of the banking sector, whilst 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 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 arise (to the left of the $dr/dt = 0$ curve). The system would head towards 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.

Can econometric analysis support this characterization of inter-war dynamics in the vicinity of E2? We have very little monthly data with which to estimate a VAR for this brief period, only 28 observations as shown in the right two columns of Table 4 for the 1927–29 resumption. [19] However, repeating the stability tests we find that indeed the data seem to follow saddle path dynamics: the eigenvalues are real but of opposite sign. Unit root tests on the series confirm an explosive path for r and $\log G$ in this period, with both collapsing, and a cursory inspection of the trajectory in the lower left portion of Figure 5 reveals a trajectory much like the putative path PP$'$ in Figure 4. Again, the correspondence between the empirical trajectories and the phase diagram is striking.

It is tempting at this point to try to explore the inter-war VAR dynamics further, since by an investigation of the signs and slopes of the various derivatives we might be able to make inferences about what type of underlying forces caused the instability. Unfortunately, we think this route is a dead end, a step into overinterpretation of the results. As is already apparent, the sign configuration on the inter-war VAR does not accord with our underlying model—for example, the upper-left derivative is negative, which is never true in the theory. We think the reason for this discrepancy is clear. Although a VAR estimated on data near a stable equilibrium (like E1) ought to be a valid local approximation, there is no guarantee that the path PP$'$ passes anywhere close to E2, and so the dynamics of the data on that trajectory are probably not well captured by a linear approximation to the dynamics at the saddle point. We see no way around this, and a preferred test of the stability in

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[19] The same lag selection process was used as before: no lags were needed in this case.

this zone might be the unit root test, which, as noted, indicates explosive behavior. Qualitatively, the best illustration is simply Figure 4, whose dynamics in the two regimes so cleanly match the prescriptions of the theory.

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 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 knew this, and when the gold window opened there commenced an internal drain (a run on bank deposits) which fed an 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.[20] Gold losses were large, about 40 percent down relative to trend in two years, and 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 towards the 10 percent level.[21]

Still, there was possibly worse to come, even after this debacle. Though the suspension of 1929 resolved the tensions in the system by halting the prevailing rules of the game so as to end the unstable dynamics, 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?

4. The Downfall of the System: A Central Bank by Default and the Costs of Polluted Institutions

Ultimately, these tensions inherent in a small open economy brought about radical institutional changes. First, in 1931, came the *de facto* end of the metallic monetary regime. Then, in 1935, came the creation of the central bank to relieve the still dismal private and public financial situation. Yet can we call these proactive institutional changes (in particular the creation of the central bank)? Or were they the reactive result of a dynamically inconsistent, ill-conceived monetary and financial structure? We have shown that the 1880–1935 period in Argentina provides a clear example of how economic crises can induce institutional changes in a cascade fashion. However, the cascade, or, as one might say, the "institutional learning-by-doing process," ended

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[20] 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).

[21] See Figure 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 1890–91 Baring Crisis, the reserve-deposit ratio at the private banks (including the then Banco Nacional) never fell below 22 percent in 1890–91. See della Paolera (1988).

up polluting the originally well-conceived institutions. Ultimately, a new institution, the central bank, had to be created by default to clean up the mess engendered by the Caja de Conversión, the Banco de la Nación, and the private financial system. Unsolved political-economy dilemmas are the offspring of of polluted economic institutions in a dynamic context. Thus, as we said before, in a regime that has incompatible goals in some bad states of nature, it is only a matter of time before well-conceived institutions fall apart under political or discretionary manipulation.

The burden of the cumulative inconsistencies in the financial system after 1914 was borne mainly by the Banco de la Nación. The 1904 changes in its charter allowed the Banco de la Nación to lend up to a maximum of 25 percent of its capital to the Treasury. This was a radical change from the maximum of 4 percent allowed in the 1891 Charter and eliminated the tight separation of commercial and developmental banking functions from the government balance sheet. Next, the 1914 rediscounting law enabled the Banco de la Nación to act as a quasi-lender-of-last-resort to the private financial system, marking the end of its quasi-narrow-banking policy of high reserves.

The First World War altered the fates of the Banco de la Nación and the financial system. 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 non-performing loans was 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 non-performing 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 over-lent to the government, with treasury-bill rediscounts exceeding the ceiling of 25 percent of capital.

The costs of this route were high, and not limited solely to the state bank. As early as 1931, with the Caja de Conversión rediscounting to the Banco de la Nación, and the latter rediscounting to private banks in an exceptionally bad state, the "lemon loans" on state's balance sheet grew large. The clean-up task was assigned in 1935 by the Congress to a specially created institution, the IMIB (Instituto Movilizador de Inversiones Bancarias).

How did this clean-up operation work? In Table 5 we show first the action by the central bank to revalue gold, a large seigniorage operation that funded the cleanup, in addition to supporting other fiscal and monetary tasks. The decision to revalue gold reserves allowed the government to generate an accounting profit of 701 million paper pesos. This was allocated to various uses as follows:

 (1) to retire some of the Treasury's floating debt, 95 million pesos;

 (2) to augment the banking reserves in the central bank, 216 million pesos; and

 (3) to supply the IMIB with funds for the bailout operation, 390 million pesos.

That is, the IMIB received 55 percent of the proceeds of the gold revaluation, which in itself represented a 58 percent increase in the quantity of outside money. How costly was this operation to Argentine households? Such a massive seigniorage tax amounted to about 7 percent of 1935 gross domestic product. [22]

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[22] The GDP figure for 1935 is 10 billion paper pesos (della Paolera and Ortiz 1995). If one

Table 5

Actions of the Instituto Movilizador de Inversiones Bancarias

		House-holds	Treas-ury	BCRA	IMIB	BNA	Esp.	Torn.	Hog.	A-U	Other	New Bank
			Public Sector				**Private Sector**					
							Old Private Banks					**New Bank**
(a) Financing of the Scheme	Gold revaluation (seigniorage)	-701	95	216	390							
	Change in Fiduciary Issue			-216								
	Change in Value of Reserve Backing			216								
IMIB Rescue of Banco de la Nación	Private Banks' redisc. from BNA					-301	142	54	40	62		3
	Private Banks' bad assets to BNA					301	-142	-54	-40	-62		-3
	BNA bad assets to IMIB				301	-301						
	Cash, IMIB to BNA				-150	150						
	Promissory note, IMIB to BNA				-150	150						
IMIB 1st Bailout of Big 4 Private Banks	Deposits, Private Banks to IMIB				-385		273	29	55	27		
	Deposits, IMIB to New Bank				385							-385
	Assets, Private Banks to IMIB				385		-273	-29	-55	-27		
	Assets, IMIB to New Bank				-193							193
	Cash, IMIB to New Bank				-129							129
	Promissory note, IMIB to New Bank				-63							63
IMIB Second Bailout	Cash from IMIB to Old Banks				-61			10			51	
	Private Banks' Assets to IMIB				61			-10			-51	
Total	Net	-701	95	216	390	0	0	0	0	0	0	0
Transfers	Net, Allowing for Bad Loans	-701	95	216	0	0			390			0
(b) Final Balance Sheet of IMIB	Loans					553	Promissory Notes					-213
	Cash in Reserve					50	"Liability" of IMIB for Cash					-390
	Assets					603	Liabilities					-603

Notes: See text. Units are millions of paper pesos. BCRA = Banco Central de la República Argentina; IMIB = Instituto Movilizador de Inversiones Bancarias; BNA = Banco de la Nación Argentina; Esp. = Banco Español y Rio de la Plata; Torn. = Banco Tornquist Co.; Hog. = El Hogar Argentino; A-U = Banco Argentina-Uruguayo.

Sources: Various confidential reports, Ministerio de Hacienda, República Argentina.

How did the IMIB go about its task? The IMIB was created to "buy fixed assets, loans, and other investments immobilized or frozen in the banks, and to make good on them gradually" (Article 1). The IMIB performed three big asset swaps to salvage the financial system:

 (1) it purchased (at book value) the "lemons" at the Banco de la Nación (the rediscounts to private banks) for 301 million pesos, swapping these for 150 million in cash and 151 million in promissory notes;

 (2) it purchased from four big ailing banks 385 million pesos in assets, and then gave to a newly-created merged bank (the Banco Español Limitado) 193 million of these assets, absorbing the remaining 192 million of bad loans in exchange for 129 million in cash and 63 million in promissory notes; [23] and

 (3) it conducted a final bailout operation with the private sector by absorbing 61 million pesos of assets in exchange for cash.

It is important to note here that the assets bailed out, a total of 553 million pesos, amounted to 16 percent of the loans of the entire financial system (including Banco de la Nación), or 32 percent of the loans of the private banking system. That is, fully one-third of the private financial system was rotten, a very large financial crisis by any standard. This upper-bound estimate of the social costs was about 6 percent of GDP. A lower-bound estimate of the social costs of the bailout would be the injection of cash to the financial system, amounting to 390 million pesos or 4 percent of GDP. And, of course, this static real resource cost understates the long-run costs resulting from the destruction of a (once) clean and well-functioning set of institutions.

How costly was this bailout in comparison to other crises past and present? Costs are often measured as the ratio of bad assets to GDP, and these have often run to 10 percent or more in recent crises. The costs here were somewhat smaller by that metric, but still large. However, we think it may be inappropriate to use that metric for historical comparisons simply because financial sectors have growth over time relative to output, a consequence of financial development in history. [24] This might prompt us to use a different test, asking how big was this crisis compared to late-nineteenth-century emerging-market crises? From the work of Calomiris (in progress) we know that in fourteen sample emerging countries from 1870 to 1913 there were only seven banking crises where the negative net worth of failed banks exceeded 1 percent of GDP. None of the seven had a cost in excess of 10 percent of GDP, and only two of the seven were above 5 percent of GDP. By this metric, the Argentine crisis of the 1930s looks severe by the standards of its time.

Alternatively, if we think use of the loans-to-GDP metric is flawed because of

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allows that the retirement of some treasury debt with this operation constituted no change in the net wealth of households, the figure falls to 6 percent of GDP.

[23] The bank merger arose because IMIB insisted that the four big banks should be broken up according to function. The new merged bank took over their traditional commercial banking operations (and the assets and liabilities associated therewith) and the original four banks were left to undertake only investment banking operations or else quit the system.

[24] See Goldsmith (1969) on the increasing size of financial sectors relative to GDP in the long run.

the intertemporal and cross-section differences in financial development, a better indicator of the depth of financial failure could be the share of rotten assets, and by this yardstick the Argentine crisis was massive compared to any other crisis in history, with a third of the private sector ruined. For comparison, the beleaguered Japanese financial system, which has been awash with bad assets for almost a decade, could report in 2000 that, at worst, only 12.1 percent of loans were in trouble. [25]

5.   Good-Bye Financial Crash, Hello Financial Repression

In 1890, Argentina was forced by a crisis to redesign its "financial architecture"; from a distance this might have looked like a thorough tear down followed by a complete rebuilding. But it was not so. To stretch the metaphor, although the exterior was demolished and replaced (the creation of the currency board), the interior structure was never really finished (the banking system was still in crony form).

The story of Argentina's first currency-board experience from 1891 to 1935 has clear parallels in today's global economy. As one contemporary observer notes:

So what is the underlying cause of financial crises in the 1990s? More often than not, they have been triggered by external financial shocks that are amplified by failed fixed-exchange-rate regimes. However, the root cause is usually a weak banking system. In many developing countries, undercapitalized and badly supervised banks borrowed too much short-term money abroad and lent it to dubious projects at home. Cronyism and corruption made these weak banks even weaker as they made loans to very risky, unworthy projects owned by their shareholders and managers. (Minton Beddoes 1998)

The Baring Crash set off what we might call an institutional search process in Argentina, but despite the good intentions of the planners the process threw up all kinds of unintended policy consequences as it evolved. With the benefit of hindsight, and seeing the decades of high inflation and hyperinflation witnessed in the post-1935 central bank era, one might even question whether the point of arrival of this process was in the end any better than its point of departure.

A safe, quasi-narrow bank such as the Banco de la Nación, and a Caja de Conversión set up as a currency board to maintain a good reputation, were created to solve the 1890s crisis. It was hoped that, unlike their predecessors, they would never descend to soft-budget constraint activities. But external economic forces and internal political manipulations during the inter-war period generated a set of challenges and temptations that disturbed the institutional design and pulled it ever so gradually off the rails until there was no possibility of return.

The Caja de Conversión was internationally visible, easily monitored and verified; it was a clear and sound adoption of the rules of the game. Much less (internationally and domestically) visible was the financial system and its workings. In the first

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[25] See Mathieson and Schinasi (2000, Annex 1, Table A1.1). This figure relies on a harsh self-assessment standard, where banks report all loans to Category II–IV borrowers—that is, borrowers in or near bankruptcy or in need of attention, excluding Category I loans which are covered by superior collateral.

phase of its existence (1892–1914) the Argentine money and banking regime functioned smoothly, faced few shocks, and was little tampered with by policymakers. In its second phase (1914–34), a series of economic shocks first polluted the private banking system and then, despite a seemingly solid design to prevent bailouts and moral hazard, took down the Banco de la Nación and the Conversion Office.

The end result was the creation of an institution—the central bank—that could, with the help of opaque and dubious maneuvers by the IMIB, cover up the mess and finally throw in the towel on the idea of external convertibility. Loosening the nominal anchor was to have adverse long-run implications for inflation performance. Having no compelling restraint on the bailouts used to protect internal convertibility, the central bank embraced a lender-of-last-resort function with regard to the private banks that was to invite moral hazard and continuing real resource drains for decades to come. In sustaining this new design, the dangers, and discipline, of a market-based system were soon superseded by the firm strictures of financial repression. This regime has been well described for the postwar period, but our paper exposes its birth pangs in the financial fiascos of the 1920s and 1930s.

With the loss of a commitment to a stable external value of the currency and, in the longer run, to a stable price level, the genie—money printing—was yet again out of the bottle. We might consider how Sarmiento or Pellegrini would have viewed these events. Both former Presidents saw Argentina as having an internal tension between progressive sectors of society seeking to create modern institutions with clear rules of the game, and conservative forces seeking to maintain a *status quo* where outcomes usually depended on arbitrary forces and the manipulation of power and influence. Sarmiento's *magnum opus*, *Civilización i barbarie*, was devoted to exactly this issue. The Conversion Office in some sense epitomized the economic attempt at *civilización*, playing by clean rules and meeting externally verifiable standards and monitoring. The more clandestine relationship between private finance and the state, and the capacity of the private banks to obtain successive bailouts from the Banco de la Nación via political means, were more reminiscent of *barbarie.*

Obviously, recent events in Argentina in 2001–02 have centered on a quite similar tension, leading to the downfall of a currency-board regime and the financial system. How was the system polluted this time? Not by the crony assets of the private sector, but those of the government itself. Throughout 2001 the banking structure absorbed bad paper from the government via forced loans and debt swaps (not to mention provincial quasi-monies, in the form of bearer bonds such as *patacones*), all this on top of a balance sheet already burdened with a large stock of low-quality assets from the deeply troubled private sector. By December 2001, some emergency measures were enacted to restrict bank withdrawals and the capital flight that had been seen since July 2001, and a dynamic very like that in our model of the inter-war period was underway. Political and economic collapse soon followed. The present, just like the past, shows that external discipline alone does not solve all the problems of macroeconomic design. In the end, in the sphere of macroeconomic policy at least, the results seem clear. Like the 1990s, the *Belle Époque* was marked by prosperity in incomes, not in institutions. By accident or, we might say, by lack of design, *barbarie* triumphed.

Acknowledgments

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