

# UC Berkeley

## Other Recent Work

### Title

Lessons of the 1890s for the 1980s

### Permalink

<https://escholarship.org/uc/item/1q7324hr>

### Author

Fishlow, Albert

### Publication Date

1987-01-26

UNIVERSITY OF CALIFORNIA, BERKELEY

Department of Economics

Berkeley, California 94720

Working Paper 8724

LESSONS OF THE 1890S FOR THE 1980S

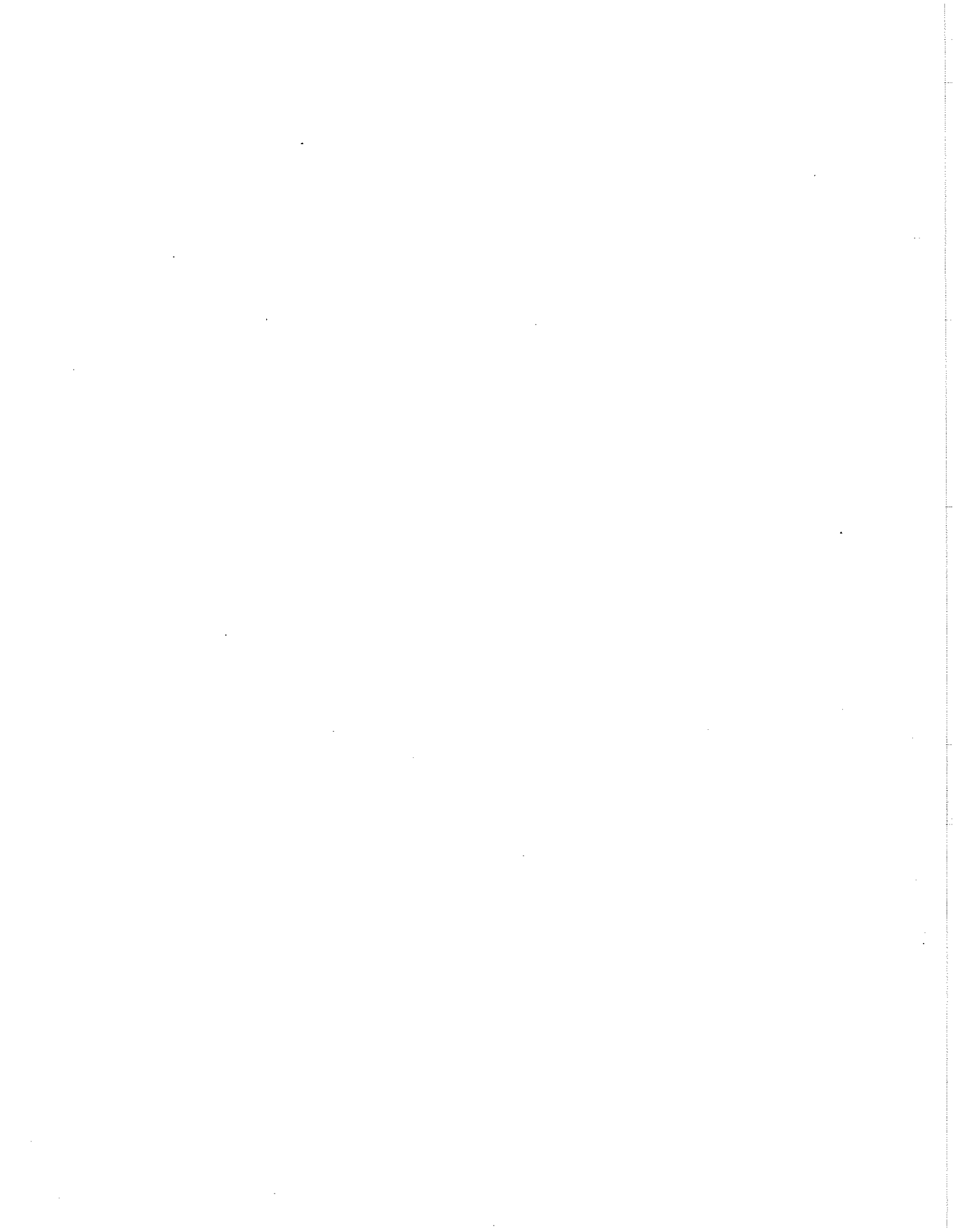
Albert Fishlow

January 26, 1987

Key words: 1890s, debt, Argentina, Brazil

#### Abstract

This paper analyzes the debt crises of Argentina and Brazil in the 1890s. It discusses the importance of domestic monetary policy versus external factors in provoking devaluation and establishes the differential role of reduced capital inflows in Argentina relative to Brazil. The paper emphasizes the different acceptance of Argentine and Brazilian securities on the London market and the consequences of market valuation for debt relief. It also contrasts the domestic adjustments required in the 1890s to achieve balance of payments equilibrium. The paper concludes by drawing parallels between the cyclical pattern of peripheral, externally financed development in the 1890s and developing country reliance on debt in the 1970s and 1980s.



## Introduction

The developing country debt problem of the 1980s has led to a resurgent interest in past episodes of financial crisis. This search for illumination is highly appropriate. What is a novelty in the post-1945 experience, because of smaller and largely public flows to developing countries until the 1970s, has ample precedent earlier.

Indeed, the principal locus of the current problem, Latin America, was the scene of recurrent episodes of financial expansion and subsequent retraction: the 1820s, the 1870s, the 1890s and the 1930s stand out. The 1830s and 1850s are missing both because of the concentration of inflows to the United States in those decades, and reaction to the defaults of the 1820s. In a regular fashion, inversely associated with long swings of domestic investment in Great Britain, foreign capital flowed to peripheral countries to finance infra-structure construction, followed by a crisis of overextension, and a period of quiescence.<sup>1</sup>

The comparison of the current decline in incomes in Latin America with the Great Depression experience is an obvious one, a discussion to which Carlos Diaz was an early and prominent contributor. His sympathies were clear as was his penchant (albeit sometimes qualified) for the indigeneous policy responses then, and again more recently, adopted by many of the Latin American countries confronting an adverse international environment: "In a world of erratic changes of terms of trade, unpredictable protectionism, and high capital mobility, commitment to fixed ex-

change rates, unlimited convertibility, and gold-standard-type monetary rules seems rash and risky."<sup>2</sup>

The decade of the 1890s, and its possible lessons, has received less scrutiny. Charles Kindleberger's recent treatment helps rectify that imbalance. His conclusion that "of all the crises in the last hundred years or so, [the crisis of 1890-93] most closely resembles the difficulties the world is passing through in 1983," justifies at least one more look.<sup>3</sup> My perspective, moreover, will be another. I intend to focus only upon the comparative experiences of Argentina and Brazil during the period as a basis for concluding observations about the relevance of the 1890s for the 1980s.

Section I provides a highly condensed story of the economic fluctuations of the two countries at the end of the nineteenth century. Both Argentina and Brazil, but with important differences, experienced booms in the 1880s followed by debt crises and significant downturns in the 1890s. Section II analyses the relative contribution of internal policies and changes in the external environment, in particular, commodity prices and access to capital markets, to the adjustments that became necessary. Section III examines the behavior of capital markets more closely. There is special interest in the valuation of Argentine and Brazilian securities on the London market, and the implications of market opinion for new capital inflows. Section IV turns to the internal adjustment in the two countries, and the role of real income and wage decline in facilitating increased production of exports and import substitutes and reduction in demand for

imports. Section V examines parallels with the present situation.

## I

### Stylized History: Upturn and Crisis

The last quarter of the nineteenth century saw a progressive integration of peripheral producers of raw materials into the international economy. British capital was a central ingredient in this process. It financed construction of railways that brought new land into production, and permitted recipient countries to live beyond their means through import surpluses. High incomes attracted the immigrant labor that was needed to populate resource rich countries and extend the world economic frontier. That combination yielded a subsequent growing supply of primary exports that justified the initial investments and established the basis for continuing economic growth in the peripheral countries and for rapid expansion of global trade.

Migration and capital flows were, however, uneven. Infrastructure investment required long gestation periods before it began to pay. Commodity prices were subject to fluctuation. The supply of foreign capital was susceptible to wild enthusiasms, and thus not surprisingly, to their disappointment. This long swing was particularly pronounced in the 1880s and 1890s in Latin America. Between 1886 and 1890 some L130 million of calls for portfolio investment in the region were recorded in the London market; in 1891-95, the comparable total is L26 million.<sup>4</sup>

Argentina and Brazil were active participants in this process of peripheral development. They were the largest recipients

of foreign investment in the region. Estimates suggest that 163 million of issues in 1886-90 were destined for Argentina, and 124 million for Brazil.<sup>5</sup> In the words of a prominent historian of Argentina, "the British investment during the 1880s expanded at a rate astonishing by the standards of that age and greater than during any subsequent decade."<sup>6</sup> There was, in addition, direct investment not recorded in the conventional financial operations. There was even purchase of local securities. In particular, a considerable proportion of the Argentine cedulas denominated in domestic currency and issued by mortgage banks to provide credit to rural producers circulated abroad.

The most prominent results of this substantial inflow of capital show up directly in physical indexes of railroad construction: the Argentine network about doubled from 5800 km. in 1886 to 12,500 km. in 1891; for Brazil, the corresponding increase was from 7600 km. to 10,600 km.<sup>7</sup> The corollary to internal transport improvement was an expansion of international trade. Argentine exports grew in volume at an annual rate of 9 percent between 1886 and 1890, but confronted weak prices. In Brazil, nominal receipts rose at a comparable rate, but because of rising prices rather than quantities. Larger coffee production from the new frontier was to come, but with a lag owing to the time required for trees to mature and bear.<sup>8</sup>

External trade was not the only measure of heightened economic activity. Immigration was another. Net immigration into Argentina reached a peak of 220,000 in 1889, a pre-1914 maximum, after averaging more than 100,000 in the four previous years.

Gross Brazilian immigration, where there was a lesser seasonal offset, peaked at 217,000 in 1891, and averaged 90,000 in the preceding four years. Contemporary accounts also corroborate rising domestic investment and proclaim a period of economic progress.

Yet, despite these signs of prosperity, the second half of the 1880s was not entirely tranquil in the two countries. Paradoxically, the favorable external environment lent itself to domestic economic experimentation and sharp political discord.

In Argentina, economic policy was frankly expansionary to the verge of excess. The country had left the gold standard in 1884 in favor of an inconvertible monetary standard. That removed the responsibility for equilibrating the balance of payments from the money supply to the exchange rate. In the absence of that discipline, easy credit prevailed. Note issue increased from 75 million paper pesos in 1885 to 245 million in 1890, in part the consequence of provincial banks were opened in response to new less stringent requirements. Public expenditure contributed in the same direction; central government deficits increased from 30 percent of receipts in 1886 to almost 50 percent in 1888 and 1889. In response to such expansionary impulses, foreign exchange moved to a premium, first sharply upward to 37 percent in 1885 and thereafter in a narrower range until upward pressures in 1889 and 1890. The progressively higher gold premiums themselves contributed to increased government outlays. External debt service, already almost 40 percent of expenditures in the late 1880s, was obligated in gold while revenues, until 1891, were



received in paper.<sup>10</sup>

The Baring Crisis in November 1890 had thus been preceded by what John Williams, in an uncharacteristic flourish, termed a "financial and monetary debauch." London observers, and the market, had taken notice of Argentine inflation and exchange rate depreciation. Holders of peso cédulas experienced capital losses and could not help but do so. Yet there was little need for domestic restraint so long as capital flows continued to underwrite rising expenditure. Ferns characterizes the government of President Juárez Celman as "the least qualified imaginable to undertake measures of the severity required and the Argentine community of 1888-9 the least likely to endure them." The choice was not entirely theirs. Efforts by the government to obtain increased financial support abroad as the situation deteriorated in 1889 were conditioned by foreign bankers upon adoption of an orthodox stabilization program. Contraction, and at foreign behest, was unacceptable to a political leadership that had already broached the possibility of paying the 1872 loan in paper pesos as a means of unilaterally imposed debt relief. Domestic opposition to the Celman presidency mounted, as stories of corruption and private gain from external borrowing circulated. A belated Argentine austerity proposal started a new round of international negotiations that again failed because of a government inability to follow through. In July an insurgency occurred, and Celman resigned on August 6, ushering in a new government committed to more responsible domestic economic policies.

The Baring Crisis broke in November, 1890 before these could

take effect. Baring Brothers was victim of an excessive faith in uninterrupted Argentine expansion. The firm underwrote and continued to hold an 1888 Buenos Aires waterworks issue that the market was unprepared to absorb in view of mounting doubts about the Argentine situation. Barings was eased into an orderly insolvency through timely intervention of the British government, the Bank of England and the London banking community. That solution, however it averted a major international financial crisis, did nothing for the continuing flow of resources to Latin America, which henceforth virtually ceased. Argentina at the end of 1890 was faced with the specter of a drastic balance of payments adjustment without the assistance of finance. The country soon was forced to suspend external debt service, and began negotiations on its debt obligations.

The Brazilian route to its eventual Funding Loan in 1898 that staved off default was similar in the respect of contributing domestic expansion, but different in the severity and timing of the reduction in capital inflows. Internal economic policy in the 1880s began from a conspicuously and consciously conservative basis. Fiscal deficits, and they were incurred, especially between 1882 and 1886, were financed by internal and external debt in preference to monetary issue. The underlying philosophy was bullionist; the proximate objective was restoration of exchange convertibility at the official 1846 parity of 27 pence per mil-reis. So long as the exchange rate remained below that point, as it did, gold standard rules called for domestic monetary  
12  
contraction.

Quickening economic expansion in the second half of the decade gave rise to demands for increased credit. An internal debate ensued between the bullionists and those seeking a more elastic supply of money to attend the needs of commerce. To this impulse was joined another, and powerful, current. Abolition of slavery, finally voted in 1888, gave rise to new pressures from powerful agricultural interests. They sought monetary accommodation not merely to sustain a new wage based labor market, but also to permit cheap credit in order to compensate for the capital losses from emancipation. Those concerns were given increased weight by the rising political uncertainty that threatened the continuity of the Empire: conservatives suddenly had an enhanced voice. On the other side, the strong balance of payments because of favorable coffee prices and capital inflows translated into accumulating reserves and a strengthening exchange rate that began to approximate par. Matters were ripe for a more expansive monetary policy.

It awaited the proclamation of the Republic in November, 1889 for the definitive conversion to monetary heterodoxy. Exchange rate convertibility was no longer the principal objective of domestic policy. Developmental necessities would determine the money supply. The domestic interest rate would be the measure of its adequacy. The exchange rate, linked to the balance of payments, would take care of itself as export potential grew. Under the guidance, and defense, of Finance Minister Rui Barbosa, the supply of money expanded by 94 percent in 1890, and a further 42 percent in 1891. Special financial provisions were extended to

industry. A boom took shape, one in which real growth and speculative activity merged in what has come to be known as the Encilhamento.<sup>13</sup>

The milreis underwent a rapid devaluation in 1890 and 1891, and continued its descent until 1898. External confidence was shaken not only by these expansionary policies of the new Republic but by a succession of political uncertainties that led to the resignation of the first republican president, Marshall Deodoro. This is not to mention the negative effects of the Baring Crisis upon evaluations of creditworthiness in Latin America and elsewhere. Not long thereafter came frank rebellion and its military repression in 1893 and 1894. The surprise is that despite such a cumulation of internal and external problems, Brazil avoided a decisive default.

Until 1897, through a combination of increased internal taxes and higher tariff collections and continued, if limited, access to foreign loans, the government met its obligations. It did so despite increasing debt service owing to exchange rate depreciation. Government requirements for sterling to make its external payments more than doubled between 1892 and 1894, and amounted to more than 100 percent of the 1894 trade surplus. A new external loan in 1895 staved off disaster, but did not prevent debt service charges from absorbing a fourth of total federal government receipts in 1897. The government sought another loan, but was not encouraged by its London bankers. Brazil eased into its virtual default with a whimper rather than a bang.

## Stylized History: Crisis Resolution and Adjustment

The Argentine problem, because of its direct linkage to the Baring crisis, was an object of immediate attention from the London bankers. Baring's ability to liquidate its Argentine holdings in an orderly fashion rested upon restoration of confidence in the Argentine economy and prospects for responsible governance. In addition, the continuing profitability of the extensive British foreign investment in the railways depended upon reversing the the accelerating gold premium that reduced sterling profits. An international banker's committee was immediately put together, chaired by Lord Rothschild. Absent French and German concurrence, whose representatives preferred a less generous new loan, a settlement was reached in March 1891.

The agreement provided for a loan of L15 million to enable the federal government to continue to meet its debt service for a period of three years. The domestic counterpart of these resources was to be used partially by the Argentine government to reduce the volume of currency in circulation. The understood rationale for such external support was that the Argentine default was primarily developmental: a temporary embarrassment that would later easily be made good by economic growth. Sound inter-<sup>14</sup>national policies would hasten the end of the liquidity problem.

Despite the Rothschild loan, prices of Argentine securities continued to slide, nor did the economy evince signs of real recovery. There were two reasons. One was that Argentina's domestic policy continued unsettled and political uncertainties intruded. Landowners favored an inflationary environment, for

their mortgage debts were fixed for the most part in national pesos, and thus had diminished with rising domestic prices. Devaluation also provided gains from increased export profits to the extent that domestic wages did not fully keep pace with higher export prices. In the midst of output decline, and with a Presidential election ahead, domestic deflation was not a popular course.

But the L15 million loan, although viewed as generous by creditors, also was inadequate after the much larger voluntary capital inflows before the crisis. In 1888-89, those had averaged L40 annually, and in 1890, L15 for the single year. The Rothschild solution corresponded only to the interest due from the federal government, excluding the foreign exchange needs of provincial governments and private foreign investors. Relative to total debt service, the loan amounted only to about a third of Argentine obligations. It thus could not prevent the dramatic decline in imports of more than 50 percent in 1891, and a corresponding fall in real income. Rather, the loan alleviated immediate pressures on the federal government to increase its share of domestic income on the basis of increased taxes and/or lower expenditures. The Rothschild agreement therefore did not avert a surge of anti-British sentiment as the cause of internal economic depression.

Many, and not only Argentines, felt that a more traditional default would have been preferable. The American consul wrote from Buenos Aires:

I do not think the government has, or will have for several years to come, the available resources to meet

an economic perspective. The arrangement did not save all that much. Full debt service, including the railway guarantees and internal gold bonds, might have come to \$10 million gold pesos, or L2 million, more. Thus the "Arreglo" was less generous than the funding loan. The former Finance Minister, Vicente Lopez, attacked the plan, commenting, "Analysis ... demonstrate[s] that, in reality, there is no motive for continuing to hold up the nation as bankrupt before our foreign creditors." The response emphasized a slightly larger gain, but more importantly, the need for such relief to equilibrate the federal government accounts.<sup>16</sup> Even in conditions of developmental default, public sector financial capacity was central. And if the foreigners could pay, rather than Argentines by borrowing, so much the better.

The creditors agreed because the market rejected the borrowing solution: the 6% funding loan sold at discounts of up to 50 percent at various times. The interest cost of borrowing thus much exceeded the rate of increase of government revenues, leading to a rising fiscal burden that Romero rejected. Indeed, the Argentine government did not fully use the funding bonds. While eventual economic improvement might have altered the key relationships between the effective interest rate and the expansion of economic activity, at the depth of the depression in 1893 it was better to keep Argentina engaged than risk overt default. Creditors hoped for settlement of the provincial debts. These amounted to about 70 percent of the national debt, and their lack of service was a major source of balance of payments relief obtained by Argentina through the 1890s. Between 1897 and

the service of its obligations, with all the economies it may practice and with all the surplus it may be able to accumulate from increased tariff and heavy internal taxation. I do not believe it will find itself in much better condition at the end of the three years' moritorium to resume the payment of interest on its bonded and cedula indebtedness than it is now. The moritorium, which seems to have been primarily intended to help the fallen house of Baring Brothers & Co., or rather the creditors of that house, has, so far as the Argentine Republic is concerned, only postponed pay day and ultimate liquidation and quite uselessly increased the bonded debt of the nation. It would have been a public relief for the Government to have defaulted outright and thus to have at once placed itself in a position to receive overtures from its creditors, leaving the house of Baring Brothers & Co. to have gone into bankruptcy in the usual way. For, in my opinion, the only hope of the Argentine Republic is in a scaling of the amount of its indebtedness or a refunding of it at a lower rate of interest.15

That certainly was the view of the new Finance Minister in the Saenz Pena government elected in 1892. New debt was not viewed as appropriate to repay old, the more so since the new funding loan sold at a significant discount. Minister Romero's determination to end the earlier agreement soon bore fruit with a new accord in 1893, the Arreglo Romero. It substituted a set period of reduced debt service for the capitalization of interest of the 1891 arrangements. For five years interest payments were to be reduced by an average of 30 percent and amortization suspended until 1901. Further, the defaulted provincial debt was to be eventually consolidated in the hands of the national government, at a discount as it turned out, and the railroad guarantees phased out. Although the Arreglo received an initially cool reception in both Buenos Aires and London, the settlement held, and was the basis for the subsequent service of the debt.

Debt relief was perhaps as significant from a political as



pl. EconuPB 724  
Fishlow

1900 the national government assumed the provincial debt in 4% bonds valued at less than 60 percent of their face value. That gain, formally recognized well after the immediate crisis, was worth considerably more than the "Arreglo".<sup>17</sup>

The eventual economic recovery that restored Argentine creditworthiness was fueled by rising exports and a large positive trade balance. After 1893 a surplus was achieved every year through the end of the 1890s, culminating in the more than 50 percent excess over imports in 1899. Rapid volume increases were supplemented by rising export prices that increased by between 7 and 10 percent a year, as estimated by different sources. Such was the improved state of the merchandise accounts that interest payments were resumed in full in 1897, a year prior to the stipulated date of the "Arreglo". Foreign borrowing recovered as well, but was never sufficient to offset debt service for the remainder of the decade. Not until the beginning of the twentieth century did another boom, with its positive resource transfers through import surpluses, resume.

Complementary domestic policy was appropriately conservative in restraining aggregate demand and imports. The volume of the monetary issue remained virtually constant after 1893. Public finance was brought under control, as deficits became smaller relative to revenues. Internal sources of taxation increased. Where at the end of the 1880s import and export duties had accounted for more than 70 percent of receipts, in 1899 the proportion had been reduced to one half despite growing trade.<sup>18</sup>

By 1900 Argentina was on sound enough basis to rejoin the

gold standard. It did so, not at the previous par, but one which reflected the then prevailing foreign exchange rate. Indeed, convertibility was now favored to prevent continuing appreciation of the peso to the disadvantage of agricultural export interests.

The Brazilian debt problem, as we have seen, lagged much behind the Argentine. Its resolution was less dramatic, and more dependent upon internal measures. Debt service was maintained without interruption through the critical years of the early 1890s after the Baring crisis. When the possibility of a moratorium was broached in 1897, Brazil's bankers, the Rothschilds, as they had for Argentina, favored a new funding loan to cover continuing interest payments rather than debt relief. The funding loan of 1898 amounted to more than L8 million, covering prospective government interest expenses on the external debt for three years. Amortization of outstanding loans was also suspended for 10 years, further reducing needed payments. On its side, Brazil agreed to undertake no new borrowing, internal or external. Such was the improved state of financial markets in the late 1890s, and the sanguine response to the Brazilian problem, that the bonds sold at par, "a financial success equalled only once before in the history of the country."<sup>19</sup>

The domestic counterpart of the agreement, as in the 1891 Argentine plan, was a Brazilian commitment to withdraw from circulation Treasury notes in proportion to the issue of the funding bonds. These were to be deposited with three foreign banks in Rio and destroyed, unless the exchange rate had risen in the interim to validate their conversion. Revenues that otherwise

would have been applied to the service of the public debt, in other words, would be used to diminish the money supply that was seen to underlie the parlous state of the foreign exchange. The loan was intended to compensate for a foreign exchange constraint, but not to underwrite a public sector deficit. Increased revenues were thus a central policy objective. Internal taxes were raised and extended to new products. Federal railroads were rented to private enterprises to operate. New gold surcharges on customs duties were voted.

This deflationary program was presided over by Finance Minister Joaquim Murтинho. An account by a sympathetic contemporary, praises him for "not having yielded even an instant and [having] challenged the impopularity [of the measures], which reached to rebellion, in order to present Brazil in conditions to present itself with unbowed head in front of its creditors." <sup>20</sup> Murтинho's contractionary monetary and fiscal policies were a coherent reflection of his strongly held Spencerian philosophy. He was fully committed to laissez faire, and its welcome destruction of unnatural, protected activity. Free competition would lead, "through business failures to natural selection, revealed by the disappearance of the inferior and the permanence of the superior." <sup>21</sup> The crisis should be in proportion to the excesses that made the cure necessary.

This policy direction, in conjunction with large trade balances that began to appear in 1900, was successful in firming the exchange rate. But there was also a cost in slackened domestic activity, punctuated by a severe banking crisis in 1900. The

abolition of additional note issuance facilities of the Bank of the Republic in 1899 exposed it to suspension of payments only a year later when anxious depositors sought to withdraw their funds. As in Argentina, the appreciation of the exchange rate affected exporters adversely and stimulated resistance. Convertibility was restored in 1906 to limit deflationary excess. A favorable balance of payments attracted a new surge of foreign investment in the last great expansion of capital export before the First World War.

Both Argentina and Brazil thus emerged from the crisis of the 1890s to gold standard orthodoxy in the first decade of the twentieth century. From threatened default in each case, averted by responsive aid from British investment banks, they came full circle to renewed creditworthiness and capital inflow. Rapid economic growth prior to the First World War completes the tale.

## II

### The Role of Internal and External Factors in Provoking Crisis

The prior condensed historical account sets the stage for this section's quantitative analysis of the comparative influence of domestic policy and external circumstances in leading Argentina and Brazil to the brink of default. Both are relevant. One cannot simply point to evidence of expansive domestic policy as proof of its importance. Large capital inflows necessarily imply an import surplus and spending beyond one's means. To blame countries indiscriminately for increased demand that absorbs

larger supply is to miss the connection between internal and external equilibrium. That does not mean, of course, that demand can never be excessive and spill over to unsustainable borrowing.

Ideally, the focus should directly be the origins of current account deficits and the allocation of foreign saving. Data limitations preclude such an analysis. But the issue can be meaningfully recast by assessing the relative contribution of internal and external factors to the determination of the variable exchange rates in the two countries. That was the way, moreover, in which John Williams first posed the question for Argentina in his classic treatment many years ago, and which Mario Teijero has recently reviewed. It is also the issue that Gustavo Henrique Barroso Franco has examined for Brazil in a new treatment of the period. The exchange rate stands as the decisive element linking together the balance of payments and the internal economy, and is a measure of the consistency of domestic policy.

Williams' assessment of the role of monetary policy was decidedly anti-bullionist, and thus against the weight of contemporaneous Argentine opinion: "It is not intended, in any case, to deny that excessive issues of paper were an important cause of its depreciation, but merely to insist that it was by no means the sole cause, and that, contrary to the opinion of many Argentine writers, the balance of payments was also an important cause of currency depreciation, --in my judgment the most important single cause." <sup>22</sup> Teijeiro contests this conclusion, asserting that "...the phenomenon of the exchange rate is essentially a

monetary matter.... a fall in external finance would have reflected itself essentially in the level of the imports which were being financed until then....<sup>23</sup> Franco's view for Brazil is the same as Williams, "that the principal determinant of exchange devaluation was the succession of large deficits in the balance of payments, beginning in 1890, whose origin traces, principally, to the retraction of capital movements to Brazil."<sup>24</sup>

Resolution of the matter depends upon specification and econometric estimation of the underlying set of relationships. The money supply, through its effects on domestic expenditure, interest rates and inflation, obviously cannot be neglected. But on the side of the balance of payments, apart from the variation in capital flows, there is also the fluctuation of export quantities and international prices. In the Appendix, a simple macroeconomic model is used to formalize these interrelationships. It makes clear how these variables influence nominal exchange rates. It is more difficult, except as a residual, to introduce the effects of sheer speculation that also entered, at least in the short term, to determine market exchange rates. And there are potential simultaneity problems emanating from reciprocal influence of the exchange rate on the independent variables that I subsequently discuss.

Table 1 presents the statistical results achieved from a reduced form specification relating exchange rates in the two countries to the money supply, estimates of the net capital account less debt service, export earnings (or the terms of trade), and British wholesale prices. I focus first on the least

Table 1  
Regression Results

Dependent Variables	Independent Variables					$\bar{R}^2$	D-W
	Real <sup>a</sup> Export Receipts	Terms <sup>a</sup> of Trade	Money <sup>a</sup> Supply	Capital Inflow Minus Debt Service	Foreign <sup>a</sup> Price		
-----							
Argentina	Gold Premium <sup>a</sup> 1884=100						
Least Squares							
1884-1900	-.54 (5.34)		.64 (11.28)	-.0018 (3.84)	-1.18 (2.64)	.95	2.49
1884-1899		-.50 (2.18)	.51 (5.70)	-.0013 (2.07)	-.18 (.23)	.91	1.89
Instrumental Variables <sup>b</sup>							
1885-1900	-.62 (3.84)		.73 (2.21)	-.0011 (.25)	-1.22 (1.71)	.91	2.01
Brazil	Milreis per pound <sup>a</sup>						
Least Squares							
1877-1897 <sup>c</sup>	-.63 (3.00)		.87 (8.13)	.0051 (.91)	-.86 (2.33)	.92	1.95
1877-1897 <sup>c,d</sup>		-.16 (1.75)	.60 (6.33)	-.0029 (.93)	-1.20 (2.41)	.96	1.77
Instrumental Variables <sup>b</sup>							
1877-1897	-1.31 (1.38)		1.03 (1.80)	-.0134 (.29)	-1.67 (1.77)	.78	1.57

<sup>a</sup> expressed in logarithms.

<sup>b</sup> Instruments: time, lagged real exports, lagged money supply, foreign prices.

<sup>c</sup> residuals corrected by a first order moving averages process.

<sup>d</sup> residuals corrected by a one period autogressive process.



(Table 1: Data Sources cont'd)

Data Sources:

Argentina

Gold premium: Ford, Gold Standard, p. 139.

Value and Price of Exports: Diéguez, "Crecimiento e Inestabilidad"

Import price: British export price deflator from Albert H. Imlah, Economic Elements in the Pax Britannica, New York, 1969, pp. 94 ff.

Money Supply: Extracto Estadístico, 1915 (average of preceding and current year.)

Capital Account: Williams, Argentine International Trade, pp. 45, 101, 136, and 154.

Foreign Price: B.R. Mitchell, Abstract of British Historical Statistics, Cambridge, 1962, p. 474-75. The Sauerbeck-Statist wholesale price index was used.

Brazil

Milreis per pence: Anuário Estatístico, 1939-40, pp. 1353-54. ] (Fiscal year averaged until calendar year series begins in 1888.)

Value of Exports: Anuário, p. 1358.

Price of Coffee: Anuário, p. 1378.

Import Price: As above.

Money Supply: Carlos M. Palaez and Wilson Suzigan, História Monetária do Brasil, Rio de Janeiro, 1976, Table A.3, pp. 442 ff. (End of June values)

Capital Account: Franco, Reforma Monetária, pp. 47-48. (Debt service was calculated from Table A-3, p. 47.)

Foreign Price: As above.

squares estimates. The findings are quite encouraging. Signs are correct, and the elasticities fall into an expected range; note in particular that the response to foreign prices is approximately unitary. Not only are the  $R^2$  high, but the individual coefficients are significant. In the case of Brazil, the coefficient values are not very sensitive whether exports or the terms of trade are used to measure exogenous effects on foreign exchange receipts; for Argentina, the coefficient on foreign prices becomes insignificant. Nor is there much consequence from substituting alternative Brazilian trade series.<sup>25</sup>

With these estimates as a basis, several important substantive conclusions follow. In the first place, there is a clear difference in the explanation of foreign exchange rates in the two countries. In Argentina, the variation in the net resources available as a result of foreign indebtedness enters as a significant variable; in Brazil, not. In both, the domestic money supply is highly significant, albeit in Argentina with an elasticity significantly less than one. Even in Brazil, with its higher elasticity in the export receipts formulation, the bullionist story is incomplete: as in Argentina, variation in real export earnings is a significant additional factor.

These results confirm Williams' emphasis upon the balance of payments as a contributing factor to Argentine depreciation. Teijeiro's revisionism derives from assumption that the exchange rate is determined exclusively by monetary policy. Changes in the capital account are argued to reflect themselves solely in changes in imports on a one to one basis. Accordingly, his

estimated regression derives from a pure monetary approach without consideration of alternative hypotheses. Although it achieves statistical significance, such a test is inadequate for the purpose of examining the role of fluctuations in the capital account.

Specifically, as applied to the Argentine situation in 1888-91, when the gold premium rose from 48 percent to 287 percent, the coefficients from equation 1 of Table 1 allocate less than 60 percent of the depreciation to the influence of the money supply and more than 40 percent to the sharp reduction in capital inflow; increased real exports in that same period move the results only modestly in the other direction. Of course, within that time interval, a different causal structure may have prevailed, possibly giving even more significance to the dislocations imposed by the sudden decline in foreign exchange availability. Contemporary preoccupation with monetary excess is not misplaced, the more so since the policy was under domestic control in a way that capital flows were not, but that explanation is far from the whole story.

The pattern of residuals tells us more. The actual level of the gold premium in 1890, before the Baring Crisis, is much lower than predicted; in 1891, much higher (by more than a standard error in both years). Once the news was out, the market overreacted relative to its earlier excess optimism. The Rothschild agreement of 1891 did little to tranquilize speculators in foreign exchange. Nor for that matter is there a discernible influence of the Arreglo Romero in 1893. The predominant cause of

the eventual appreciation was the steady improvement in export receipts and a stable money supply. Net cash flows from foreign investment remained negative starting in 1890.

In the Brazilian case, the level of net flow on capital account is statistically insignificant in influencing fluctuations of the exchange rate. Contrary to Franco's generalization from the Argentine experience, the Baring Crisis is not a decisive factor. On reflection, the result is not surprising. While Brazil received a large capital inflow in 1888 and 1889, the local peak is not as pronounced as for Argentina; 1883 is as important as the latter year, for example. Correspondingly, the extent of change in the capital account in the 1888-91 period is less severe than it was for an Argentina much more dependent upon capital imports. The Argentine net balance on capital account goes from 150 percent of recorded imports to minus a third. In Brazil, the variation is about half as great; the net balance moves from less than a hundred percent to minus 15 percent. At the same time, the Brazilian quantity of money more than triples as against the Argentine doubling.

On the other side, external loans continued to be contracted in the 1890s, during 1893 and 1895-97. Indeed, capital flows remained positive on the eve of the refunding. The balance of payments counts in the Brazilian case through trade rather than through irregular capital flow. That is again consistent with the timing of the Brazilian default, brought on in the later 1890s by continuously falling coffee prices rather than slowing foreign investment in 1890-91 as in Argentina.

The Brazilian external crisis in the early 1890s was much less severe. The exchange rate depreciated but economic activity persisted, and even accelerated. While net immigration to Argentina was negative in 1891, as imports declined by more than 50 percent, population inflows to Brazil more than doubled, partly reflecting exits from Argentina. In subsequent years, through 1898, Brazil attracted much higher levels of immigration than it had earlier, and record proportions of total movement to the United States, Argentina and Brazil.

When Brazil was finally forced to resort to a funding loan in 1898, it was after the international crisis already was over. Rather, the crisis was particular, one of diminishing coffee prices due to oversupply. Brazil was a prominent contributor to the problem: its exports had expanded by 1897 to the 9 million sack level from the earlier capacity of 5 to 6 million. Its sterling receipts fell over the same period by almost a third. That is the reason for continuing depreciation after the effects of smaller foreign investment and the large increase in the money supply had worked themselves out by the mid-1890s. Brazil specialized in a commodity that failed to share the general price upturn associated with cyclical revival. Brazil was not able to grow into its debt until the coffee price stabilized after 1900 and then began to ascend after 1909. That, and the rubber boom, assured a rising trend in export receipts prior to the First World War.

The structure of residuals from the exchange rate equation corroborate the limited contagion effects from the Baring Crisis.

There is a substantial -more than a standard error- undershooting of the actual exchange rate relative to its predicted value in 1890 and 1891. The actual rate remains slightly below its predicted value in 1892. The very large increase in the money supply sanctioned by the Republic ought to have driven the mil-reis down more than it was. Despite the political uncertainties surrounding the establishment of the Republic, markets did not speculate against Brazil as long as there was a continuing capacity to service debt, as there was. This lag, moreover, helped to keep imports of capital goods cheaper just at a time when domestic policy was expansive, and contributed to the more import substitution intensive style of Brazilian adjustment that will be further explored in Part IV.

These regressions take the money supply as exogenous. Yet, as I have emphasized in Part I, there was a reciprocal influence exercised by the exchange rate upon the note issue through government need to cover the increased debt service measured in domestic currency. There were pressures as well from the local business community for more credit to compensate for depreciation of the exchange rate. These reasons help to explain the inability of governments in either country to shift easily, or early, to more restrictive monetary policies in response to balance of payments constraints. The Argentine promise to destroy paper money as the counterpart of the Rothschild Loan in 1891 was not kept. In Brazil, those draconian measures were not applied until the exchange rate began to appreciate again after 1898. Still, the responsiveness of the money supply to the exchange rate was

hardly regular or assured. Governments did seek to increase their sources of revenue, both by surtaxes on imports as well as by new internal levies. And Brazil was able to contract new external loans.

Quarterly series on the exchange rate and money supply for Brazil permits a closer examination of this causality question. Table 2 reports the results of Sims causality tests on the two-way relationship between money and the exchange rate. (Although the embedded relationship within a larger model would ideally call for a multivariate test, the requisite quarterly information is not possible.) For the long period, from 1882 to 1905, the tests are consistent with a causal structure of one-way influence of the money supply on the exchange rate. Future values of exchange rates make a statistically significant contribution to the explanation of nominal money. That contribution is conspicuously absent in the reverse regression.

Note, however, that the explanatory influence of the money supply on exchange rates in these equations is modest;  $R^2$  only reaches  $.13$ .<sup>26</sup> The signs of the effects are consistent in the lag structure, with the exception of a statistically significant reverse effect in the third lagged quarter, and a reverse effect again in the eighth. The sum of the elasticities is, however, implausibly high. These quarterly results corroborate the view that the relationship of the exchange rate to the money supply was not the simple bi-variate one proposed by the bullionists, but also strongly influenced by the evolution of capital flows and export earnings.

Table 2  
Causality Tests, Money and Exchange Rates  
Brazil

F test on Future Coefficients		
Regression Equation	1882.3-1905.4	1888.1-1902.4
Money on Exchange Rates	6.46*	1.23
Exchange Rates on Money	1.34	0.93

\* Significant at .01 level.

Note: Data were in logarithms and prefiltered by a two period autogressive process. The equations included a constant, seasonal dummy variables and a time trend in addition to current, eight lagged, and four future values of the independent variable.



For the shorter interval from 1888 to 1902, encompassing the period of greatest interest, the conclusion, moreover, is indeterminate. In neither case is there a significant future influence on the other variable. This mixed result confirms the possibility of a more complex interaction during at least some part of the 1890s. But it is difficult to introduce such endogeneity into the model in a meaningful way, given the limited available data and degrees of freedom.

Beyond the simultaneity of the money supply, there is the further question of the influence of exchange rate changes on capital flows as well as on export receipts. Foreign investment in the two countries, while influenced by local circumstances, also was affected by British conditions and response to general international opportunities for capital flow. Moreover, the obvious persistence of investment in both Argentina and Brazil, despite depreciation, argues against a straightforward reciprocal relationship. The supply effect of the exchange rate for Argentine exports, and the fact that Brazil was not a price taker in the coffee market, introduce other sources of potential bias.

An instrumental variable solution to the problem, such as applied by Cardoso in her analysis of Brazilian exchange rates, is one way to deal with such simultaneity.<sup>27</sup> It should be recognized, however, that the lack of an obvious and available broader set of exogenous variables deriving from a complete model does make the results somewhat arbitrary. Different instruments yield different estimates. Using as instruments lagged values of some of the suspect variables it is possible to approximate the coef-

ficients of the least squares results, albeit with much less statistical significance. These equations are also presented in Table 1. Unfortunately they fail to replicate the least squares finding of a significant difference in the role of net financial flows in the two countries. I am not inclined to exaggerate this lapse. Additional evidence corroborates the distinction between the Brazilian and Argentine experiences.

### III

#### Stock Market Evaluations

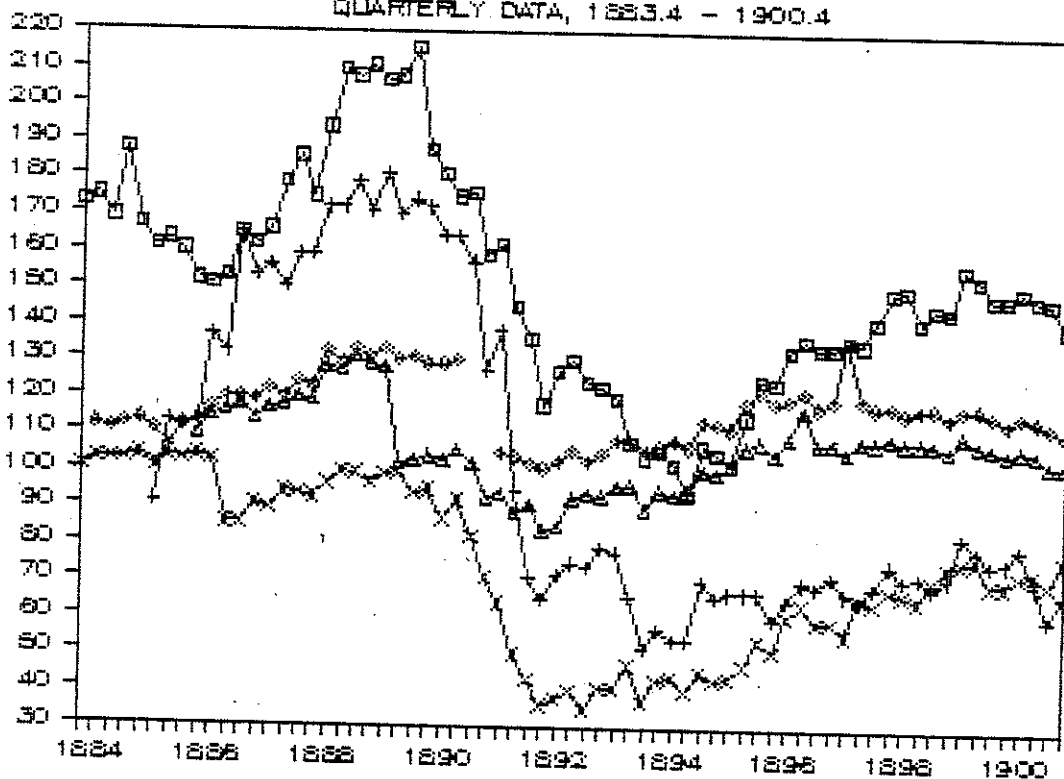
This differentiation shows up vividly in the London stock exchange evaluation of the prospects of the two countries during this period. Charts I and II plot the quarterly prices of Argentine and Brazilian government bonds, railway debentures and railway shares between the end of 1883 and 1900.

The Argentine collapse in all categories is dramatic. Note in particular the decline in prices of government bonds beginning at the end of 1889. A revision of confidence does not simply await the Baring Crisis; rather, prior price softness of government issues made Baring Brothers unable to sell off its large holdings of a new Buenos Aires waterworks issue and increasingly illiquid. A small recovery is apparent in 1891, related to the Rothschild Agreement, but that gives way to a further decline. Most series do not reach bottom until 1893.

Brazilian performance is far less cyclical as prices move within a much narrower range. The price decline of the early 1890s awaits the fall out from the Baring Crisis in 1890, and

# ARGENTINE SECURITY PRICES

QUARTERLY DATA, 1883.4 - 1900.4

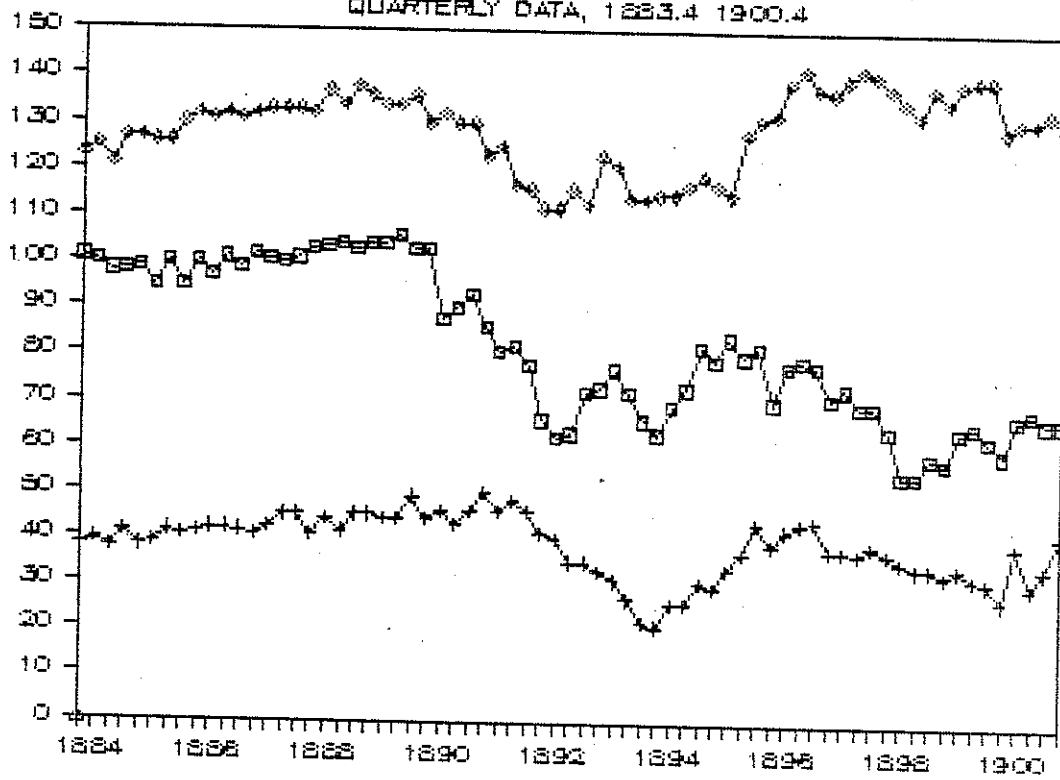


□ BAGS      + BA&R      ◇ BAGS D      △ BA&R D      × ARG

CHART 1

# BRAZILIAN SECURITIES PRICES

QUARTERLY DATA, 1883.4 1900.4



□ GOVT. BONDS                      + SAN PAULO STOCK                      ♦ SAN PAULO DEBT

CHART 2

lasts until 1893. Thereafter only the price series of government bonds betrays the later Brazilian refunding in 1898. Evaluation of railroad prospects, especially in the case of the debentures, was for the most part independent of the country's foreign exchange and fiscal difficulties.

Table 3 presents the results of a more formal analysis of the comparative price variability of shares of Argentine and Brazil railways. Three well established private lines were chosen. Their earnings and dividends were independent of the government guarantees that other newer and riskier projects continued to require. Their prices would therefore be expected to be less affected by concerns about inadequate public receipts and to provide a better measure of differential investor reaction to returns in the two countries. I use a Shiller excess volatility test to describe market evaluation. The first column shows the standard deviation of actual market price,  $(P)$ . The second shows the standard deviation of the price,  $(P^*)$ , calculated with perfect foresight from the stream of real future dividends, discounted to present value.

Efficient markets, where the expected actual price is equal to the ex post rational price,  $P^*$ , should correspond to a smaller variance of the actual price series than the constructed series because of forecast error. In fact, here, as in other applications, the reverse is true. The values in column 1 regularly and substantially exceed those in column 2. My interest is not in definitively testing the formal efficiency of the London Stock Exchange at the end of the nineteenth century; there are problems

Table 3  
 Variance Bounds Test  
 1883.4-1900.1<sup>a</sup>

	$\sigma(P_t)$	$\sigma(P_t^*)$
-----		
Argentina		
Buenos Ayres Great Southern	31.3	7.7
Buenos Ayres & Rosario	47.0	7.0
Brazil		
Sao Paulo RR	7.2	1.7
United States		
Pennsylvania RR	7.8	1.4
Pennsylvania RR (Detrended) <sup>b</sup>	.08	.008

<sup>a</sup> Dividend data were used for the period until 1914 to calculate  $P^*$ .

<sup>b</sup> Detrended by dividing estimated exponential values for price and dividends into actual values. Detrending was unnecessary for other series.

Data Sources:

Nominal Prices: The Economist  
 Argentine Railway Dividends: C. Lewis, British Railways in Argentina, 1857-1914  
 Brazilian Railway Dividends: R. Graham, Britain and Modernization  
 Pennsylvania Railway Dividends: Poor's Manual of Railroads  
 British Wholesale Price Deflator: B.R. Mitchell, European Historical Statistics

associated with a simple application of the method, particularly in small sample periods such as I have used here.<sup>29</sup> Rather, I wish to emphasize how these specific observed prices over the course of the last nineteenth century long swing in foreign investment were much more variable than their relatively stable stream of dividends would give reason to expect. The implication is that something else is at work than continuously accurate assessment of potential profits.

Commentators on historical cyclical processes have long insisted on cumulative excesses and faulty expectations. The statistical results are more consistent with Charles Kindleberger's story of Manias, Panics, and Crashes, than with assumptions that markets accurately use all the information available to it all the time. German investors, when they stopped subscribing to Argentine loans in 1888, may have been able to form rational expectations, but their less fortunate British counterparts evidently did not.  
30

Foreign securities posed a special informational problem. There was a large difference between insiders and outsiders. It was the insiders who not only manipulated what outside investors learned about the real state of affairs, especially in an era in which the financial press was not always independent, but who also influenced outcomes by their own decisions. When investment banks made available additional resources to stave off Brazilian default, they preserved their own reputations and boosted the values of Brazilian securities. Baring Brothers, when it extended credit to Argentina from 1888 to 1890, did so in the hope of

being able subsequently to benefit directly from a better market evaluation.

This overreaction of markets, whether through fads or self-justifying bubbles, was not confined to Argentine securities, although that shift of enthusiasm is evident in the high price volatility recorded in Table 3. For the Sao Paulo Railway, as for the Pennsylvania Railroad, the cyclical swing in share prices also much exceeded the real variation in earnings. Foreign issues underwent a generalized reduction after 1890, without a fine discrimination of underlying values. Distinctions were not altogether lacking. How the reallocation of portfolios came out, however, is not altogether clear. On the one hand, S. F. Van Oss noted the strength of European securities after the Baring Crisis: "The alternating rage for South American and European Securities and its result upon their quotations has been one of the most interesting phenomena of the Stock markets during recent years." On the other, there is reference to British sale of good U.S. securities in order to be able to carry "bad Latin American loans," with attendant price pressure.

Of particular importance here, the calculations of Table 3 provide no indication of a stronger unwarranted reaction in the share prices of the Brazilian Sao Paulo Railway than of the American Pennsylvania Railroad. Despite much contemporary comment, the contagion effect arising from Brazilian proximity to Argentina does not seem to have been especially severe. The statistical result is consistent with the continuing ability of the Brazilian government to call upon its foreign bankers in the



early 1890s. Brazil's problem was not the Baring Crisis but adverse export earnings.

A final observation relates to the much greater calculated variability of the ex post rational Argentine share prices compared to other railroads. The real cycle was in fact more severe in that country, as I comment in Part IV. The market was not wrong to be more cyclical than with respect to other securities; it seems, however, to have far surpassed what was justified.

Table 4 elaborates another comparative measure of the volatility of the London market response. It presents the standard deviations of the spot returns on two debt instruments, government bonds and private railway debentures, for Argentina, Brazil and the United States, all against the benchmark British Consols. Rankings are as expected. The greatest variability attaches to Argentine government bonds, followed by Brazilian, and then, close together and much smaller, the American and British public securities. All of the differences between these variances, except for the narrow American and British difference, are statistically significant using a conventional F-test at the .01 level. The variation among private bonds is much smaller than for public issues, and there is little to choose between the Argentine and Brazilian issues, both much greater than that of the Pennsylvania Railroad.

These large fluctuations in security prices were not completely dysfunctional. They served an important signalling function. The sharp decline in prices of Argentine bonds set in motion external relief, first the Funding Loan of 1891, and when

Table 4  
Standard Deviations of Spot Interest Returns  
1883.4-1900.1

Security	Standard Deviation
U.K. Consols	.00148
Argentina	
Government Bonds <sup>a</sup>	.0232
Buenos Ayres Great Southern	.00828 (to 1890.2)
	.00219 (1891.1 to 1900.1)
Buenos Ayres & Rosario	.00337
Brazil	
Government Bonds	.00976
Sao Paulo RR	.00293
United States	
Government Bonds	.00170
Pennsylvania RR	.00090

<sup>a</sup> Adjusted for temporary reduction in interest rates in accordance with Arreglo Romero of 1893.

Data Source:

Nominal Prices: The Economist

that failed to serve, the Arreglo Romero in 1893. Faced with the fait accompli of capital losses, investors had an incentive to accept settlements that might improve their situation. Debt relief, if it could serve improved market evaluation, was worth trying. Investment banks, with limited direct exposure, could and did serve as intermediaries to allocate the losses emanating from investment mistakes between countries and bondholders. They thereby minimized sacrifice to the dead hand of the past. Sometimes, however, they enforced past obligations. When renegotiations were unsuccessful, the banks were instrumental in reducing country access to capital markets.

The market itself stood as a decisive arbiter of the success of those policies. Its failure in 1891 and 1892 to validate the preferred Rothschild expedient of capitalizing interest contributed to a willingness to consider a more favorable settlement for Argentina. In contrary fashion, the more enthusiastic reception of the Brazilian Funding Loan of 1898 at par value, in part because of the severely deflationary domestic policies that improved balance of payments prospects, precluded resort to more generous efforts.

This discussion of market evaluation of Argentine and Brazilian issues supports two basic conclusions. First is the mixed rationality and irrationality of market performance. While markets were hardly perfectly efficient, as their overreactions demonstrate, they nonetheless made important distinctions among borrowers and among different classes of securities. The Baring Crisis hit Argentina hardest, and government bonds far the worst.

Second is the important relationship between the barometer of the market and investment banker intervention. Overt valuations facilitated concessions from creditors to debtors and helped to align relief more closely to capacity to pay. This institutional mechanism operated in the 1890s, without a formal governmental structure, to ease the internal adjustment required of Argentina and Brazil in response to deteriorating external circumstances.

#### IV

##### Internal Adjustment

Adjustment could not be evaded. After the flow of capital slowed, it was incumbent upon Argentina and Brazil to improve their trade balances. In the Argentine case, the first phase was a dramatic reduction of imports in 1891 to virtually half the previous year's level. Not until 1904 would the 1890 import level be surpassed. Almost certainly that decline was associated with a large fall in income; the immigration data are certainly consistent with an unusually large reversal in economic activity. Thereafter, as the beneficent effects of earlier investment were realized, gradually increasing exports played the role of easing the foreign exchange constraint. The depreciation of the exchange rate was not a central factor in evoking this new export supply; it largely compensated for the decline in food and raw material prices worldwide.

Import substitution, however, was unambiguously favored by the new structure of relative prices. Domestic prices of imports rose in accordance with the gold premium, moderated only a little

by modestly declining British export prices of manufactures. In addition, as the expanded need for governmental revenue was felt, tariffs were raised, adding a further margin of profit for local industrial activity. Crucial to the result was the failure of nominal wages to keep pace. Calculations of Argentine real wages confirm a large difference depending upon whether the nominal series is deflated by the exchange rate or a cost of living index. Recent research by Roberto Cortes Conde emphasizes the latter, and hence an improvement in the standard of living, in contrast to the conventional wisdom of significant deterioration.<sup>32</sup> But from the standpoint of the firm, what counts is the product wage. Cheap food prices kept nominal wages low, despite slowing immigration, and favored industry.

That there was significant progress in the industrial sector in Argentina from 1890 to 1895 seems clear. Exactly how much is still a question. As one Argentine chronicler of the industrial sector puts it: "Unfortunately, for lack of [data], we cannot express in numbers the notable advance registered in the quinquennium 1890-95."<sup>33</sup> The return of prosperity to the rural sector at the end of the decade reduced the momentum toward industrialization created by the foreign exchange crisis. Argentina followed comparative advantage in specializing in primary exports. Sectoral production accounts after 1900 show the share of manufacturing in that year to be about what it was in 1910, and for that matter, only slightly lower than it was at the end of the 1920s.<sup>34</sup>

It took more than a decade of large trade surpluses in the

1890s for Argentina again to come into favor in world capital markets. That was still in time to participate in the last British surge of foreign investment before the First World War. External capital made up a large share once more of total investment, though undoubtedly smaller than it had been before. There was less excess on this occasion, and no repetition of the earlier debacle. Debt export ratios had been reduced to serviceable proportions by economic growth.

The Brazilian adjustment, like the crisis itself, was different in character. It did not have to be as restrictive in the early 1890s. Indeed, for a time -as had been true earlier in Argentina- an expansive domestic policy coincided with continuing imports of machinery and equipment. While the Argentine share of British exports of equipment and railroad material more than halved from 1886-90 to 1891-95, the Brazilian share more than doubled.<sup>35</sup> At the same time, there is evidence of greater import substitution, certainly in the textile sector, as tariffs were effectively increased by imposing gold quotas. Murtinho would have been less exercised on the subject of "unnatural industrialization" when he assumed office in 1898, if so much expansion had not occurred in the early part of the decade.

At first appearance this industrial surge seems to have occurred with a relative price structure that was less favorable than the Argentine. The ratio between domestic prices, as given by the Lobo cost of living index, and the price of imports does not register a large increase.<sup>36</sup> The close correspondence between the two indexes is not definitive evidence. The Lobo index

includes relatively few products, nine, of which three were imports, and does not accurately reflect either prices of manufactured products or domestic wages. The latter were likely to be held down, despite economic expansion, by a continuing flow of immigrants. This elastic supply of labor, in conjunction with continued opportunities for imports of capital goods and reduced imports of consumption goods, created a very favorable climate for Brazilian business investment.

The later balance of payments crisis in Brazil reinforced this start, although Murtinho's policy rhetoric would hardly have suggested it. The requisite trade balances after the Funding Loan of 1898 were achieved through 1900, at least, more by import reduction than export growth: between 1895 and 1900 exports (in L sterling) were virtually constant; imports were more than 25 percent smaller. Deflationary policies depended for their success upon increased tariff revenue, moreover, providing increased protection that offset an eventually appreciating exchange rate.

In the last analysis, Brazil was better able to sustain its surge of industrial activity begun in the 1890s because coffee was a less favorable export opportunity than Argentine wheat and meat. By the beginning of the twentieth century there was a widening consensus that coffee was in oversupply, leading by 1906 to active Brazilian efforts to support its international price. Sao Paulo coffee wealth was attracted into industry as a more profitable long run application. The capital of the state soon established itself as the leading center of Brazilian, and Latin American, industrial production.

Unlike Argentina, which could reliably depend upon vigorous export growth for renewed prosperity, Brazil found itself in balance of payments difficulty again on the eve of the First World War. It took another funding loan in 1914 to avert a formal default. This recurrence of the foreign exchange constraint was not to be the last. In these conditions, it is not surprising that import substitution found a more comfortable setting in Brazil than Argentina.

## V

### Lessons from the Past

The Argentine and Brazilian experiences of the 1890s suggest four conclusions that relate to the present debt problem of developing countries.

First, the difference between the Argentine and Brazilian crises in the 1890s emphasizes the importance of attention to the specifics within the commonality of the external environment. Although both countries participated in the same international cycle, their pattern of response was nonetheless quite individual. The path to the debt problem, as well as efforts to resolve it, were distinct. Such subtlety is often lacking in present discussions. All sorts of countries are thrown together under the same rubric: Latin American and African, oil exporters and oil importers, diversified exporters and commodity producers. More troubling, while the current debt policy heralds its case-by-case approach, the analysis is typically excessively universal. Excess demand is invariably at fault for external disequilibrium,



and extensive balance of payments adjustment via the same set of policy instruments must be accomplished within a short span, whatever the cost in domestic output and income. Only now, after several years of painful lost growth, is there beginning to be greater sensitivity to the different structural conditions in debtor countries. reason for commonality, more careful attention to individual countries makes sense. Indeed, the problem with the case by case approach that is presumably current policy is that the analysis proceeds universally: balance of payments adjustment comes first, and at whatever expense.

A second, and related, lesson derives from the historical response to imminent default. Late nineteenth century international financial institutions responded both speedily and flexibly. Two elements were central. In the first instance, investment banks recognized the importance of debtor country capacity to pay in devising their debt rescheduling arrangements. Market evaluations assisted in persuading creditors of the need to make adequate concessions. In the second place, debtor countries had strong incentives to cooperate in reaching an agreement. Peripheral countries like Argentina and Brazil were integrated into a growing international economy and could anticipate a return to capital markets under the auspices of the same investment banks. Countries today do not receive the same recognition of the gravity of their debt problem -it is always about to be resolved by OECD growth and a little more austerity- while at the same time facing a lack of new capital inflows as commercial banks curtail their commitments. Private arrangements seemed to have operated

in the past more effectively than our more formal multilateral debt regime. They assured a pragmatism and practicality that would be welcome now.

A third conclusion is the apparent greater ease of historical adjustment of Argentina and Brazil. Trends were favorable for immigration and utilization of new land. Regular developmental growth permitted a continuing expansion of export capacity in Argentina that produced the export surpluses required before a return to new capital inflow. In Brazil, much larger coffee output coincided with favorable prices in the upswing in the first decade of the twentieth century. Austerity was more temporary. In part for that reason, it was also politically easier to sustain the required reverse transfer of resources. Expectations about continuing rises in real income were more limited in a world that was profoundly cyclical; prosperity never lasted, but, on the other hand, could reasonably be expected to return. Adjustment was measured over the course of the decadal downswing of the Kuznets cycle, not in a matter of a few years. Debtor countries now are rightly less confident about the regularity of recovery of the global economy, and face more impatient societies that demand higher standards of economic performance.

I conclude with a final observation derived from this examination of the 1890s. Developmental strategies began to diverge for Argentina and Brazil at that time, as the latter began to opt for greater industrialization while the former pursued its considerable absolute and comparative advantages in agriculture. Conventional wisdom, and high Argentine real income, scorned the

Brazilian attempt at import substitution. Looking back, the Brazilian choice does not now seem quite so unreasonable. There is something to be said, as Carlos Diaz Alejandro would have, for national innovation, intervention and experiment when simple orthodoxy fails to provide satisfactory answers in the face of large changes in the economic environment.

## Appendix

A simple macro-economic model of simultaneous internal and external equilibrium can be used to relate exchange rates, income, domestic prices and interest rates to a set of exogenous determinants.<sup>1</sup>

I start with a conventional internal equilibrium relationship between level of income and exchange rates, and interest rates:

$$(1) \quad Y = f(\text{ExR}, r)$$

Y is inversely related to a higher (i.e., appreciated) exchange rate since the net export surplus declines, and also inversely related to higher interest rates through sensitivity of investment expenditures.

The next equation is a standard demand for money equation relating real demand for money balances to real income and to the opportunity cost of holding money, the interest rate:

$$(2) \quad \frac{\text{Mon}}{P} = g(Y, r)$$

Equation (3) is the balance of payments identity:

$$(3) \quad P_x \cdot X - P_m \cdot M(Y, \text{ExR}) + F - iD = 0$$

---

<sup>1</sup>This model differs in two respects from a related one of Eliana Cardoso, which she used as the basis for analyzing Brazilian exchange rates over the period 1862-1906. Unlike her, I do not reduce import demand back to domestic supply, and hence do not require a domestic wage variable. The data are at best precarious (a questionable cost of living index must be used), and nominal wages are dubiously regarded as exogenous. On the other hand, this version places the capital account in a place of prominence, which seems more appropriate in a late nineteenth century context. See her "Exchange Rates in Nineteenth Century Brazil: An Econometric Model," Journal of Development Studies, Vol. 19 (no. 2), Jan. 1983, pp. 170-178.

Exports are taken here to be exogenous. Where there is relatively little substitutability in production, and long lags in response to past price signals as with coffee, this simplification is justifiable.  $F$  is net foreign lending, while  $iD$  is interest on past debt.

Equation (4) sets up the purchasing power parity equality of domestic prices to the exchange rate and foreign prices:

$$(4) P = P^*/ExR$$

This model then jointly determines the form endogenous variables  $Y$ ,  $ExR$ ,  $r$  and  $P$  for given values of  $Mon$ ,  $\frac{P X}{P_m}$ ,  $P^*$  and  $(F - iD)$ . (Export earnings are here deflated by an import price index and thereby converted to a measure of import capacity.)

Because of data limitations, the only dependent variable available for test, but the relevant one for our purposes, is the exchange rate. Its relationship to the exogenous variables is clear. An increased supply of money leads to increased expenditure and domestic prices which in turn contribute to a balance of payments deficit; hence the relationship with nominal exchange rates is negative. Larger import capacity leads to appreciation in the exchange rate since it produces an excess supply of foreign exchange. Foreign prices are directly related to exchange rates with a unitary elasticity: higher (lower) foreign prices provide scope for proportional appreciation (depreciation). Finally, an increase in loans net of debt service operates exactly like an expansion of exports.

## Footnotes

- \* I am indebted to Menzie Chinn for much appreciated research assistance and valuable observations, and to Eliana Cardoso for helpful comments on an earlier draft.
1. For a discussion of this process over a longer span, see my "Lessons from the Past: Capital Markets during the Nineteenth Century and the Interwar Period," International Organization, vol. 39, no. 3 (Summer 1985), pp. 383-440.
  2. Carlos F. Diaz Alejandro, "Stories of the 1930s for the 1980s," in Pedro Aspe Armella, et. al., eds., Financial Policies and the World Capital Market: The Problem of the Latin American Countries, Chicago, 1983, p. 32.
  3. Charles P. Kindleberger, "International Propagation of Financial Crises: The Experience of 1888-93," in Wolfram Engels, et. al, eds., International Capital Movements, Debt and Monetary System, p. 217.
  4. These estimates follow Matthew Simon's estimates of calls on the London market, republished in A.R. Hall, ed., The Export of Capital from Britain 1870-1914, London, 1968, p. 40.
  5. Estimates that are crudely comparable with Simon's calls are derived, for Argentina, from A.G. Ford, The Gold Standard 1880-1914: Britain and Argentina, Oxford, 1962, p. 195; for Brazil, from Gustavo Henrique Barroso Franco, Reforma Monetaria e Inestabilidade durante a Transicao Republicana, Rio de Janeiro, 1983, p. 41.
  6. H.S. Ferns, Britain and Argentina in the Nineteenth Century, Oxford, 1960, p. 397.

7. For Argentina, Ernesto Tornquist & Co., The Economic Development of the Argentine Republic in the Last Fifty Years, Buenos Aires, 1919, p. 117; for Brazil, IBGE, Anuario Estatístico do Brasil, 1939-40, Appendix, p. 1336.

8. Direct measures of production do not exist for this period. Argentine national accounts, as estimated by the Economic Commission of Latin America, begin in 1900. (See Carlos F. Diaz Alejandro, Essays on the Economic History of the Argentine Republic, New Haven, 1970, Appendix Table 19, pp. 418 ff.) The estimates of Contador and Haddad for Brazil, although sometimes used, are quite inappropriate. They are simply the nominal value of imports and exports deflated by an index of purchasing power parity. As such they do not correspond to real trade quantities, and largely mirror movements in the exchange rate. No wonder, then, that the early 1890s show decline while a period of later deflationary policy produces a large increase in "output". Note as well the extraordinarily large changes in prices, measured by the index of purchasing power parity. ("Produto Real, Moeda e Precos: A Experiencia Brasileira no Periodo 1861-1970, Revista Brasileira de Estatística, vol. 36, no.143 (July/Sept. 1975), pp. 407-440.)

These Argentine export data are the revised estimates based on market rather than official prices. (Hector Dieguez, "Crecimiento e Inestabilidad del Valor y el Volumen Fisico de las Exportaciones Argentinas en el Periodo 1864-1963," Desarrollo Economico, vol. 12, no.46 (July/Sept 1972), pp. 333-349. The Brazilian data are from Anuario Estatística, 1939-40, Appendix,

pp. 1353 ff.

9. Argentine migration data are in Tornquist, Economic Development, p.15. For Brazil, see Douglas H. Graham, "Migracao Estrangeira e a Questao da Oferta de Mao-de-Obra no Crescimento Economico Brasileiro -1880-1930," Estudos Economicos, vol. 3, no. 1 (1973), p. 33.
10. For information on public finances see Tornquist, Economic Development, Ch. XII, pp. 276 ff. For note issue, Ford, Gold Standard, p. 195.
11. John H. Williams, Argentine International Trade under Inconvertible Paper Money: 1880-1900, reprinted, New York, 1971, p.114. H.S. Ferns, Britain and Argentina, p. 441.
12. For this discussion, I follow Franco's recent analysis of monetary reform in the 1880s, Reforma Monetaria. See also the still useful contemporary view in J.P. Calogeras, A Politica Monetaria do Brasil, translated and reprinted, Sao Paulo, 1960.
13. I have emphasized the important real consequences of the Encilhamento in my "Origins and Consequences of Import Substitution in Brazil" in Luis DiMarco, ed., International Trade and Economic Development: Essays in Honor of Raul Prebisch, New York, 1982. For a more recent analysis, see Maria Barbara Levy, "O Encilhamento" in Paulo Neuhaus, ed., Economia Brasileira: Uma Visao Historica, Rio de Janeiro, 1980, pp. 191-256.
14. See the discussion in Williams, Argentine International Trade, pp. 123 ff.
15. Reports from the Consuls of the United States, Vol. XXXVIII, Washington, 1892, p. 453.



16. See the discussion in the Review of the River Plate, Sept. 16, 1893, pp. 11ff.
17. The national government exchanged \$86 million gold pesos in 4% bonds for \$151.8 million gold pesos of provincial bonds according to the 1899 Report of the Finance Ministry cited by Harold E. Peters, The Foreign Debt of the Argentine Republic, Baltimore, 1934, p. 47.
18. Data on the distribution of revenues at the end of the 1880s come from Laura Randall, A Comparative Economic History of Latin America, 1500-1914, Ann Arbor, 1977, vol. 2, p. 221; for 1899, from Tornquist, Economic Development, pp. 288-89.
19. J.P. Calogeras, A History of Brazil, Chapel Hill, 1939, p. 303, translator's footnote.
20. Calogeras, A Politica Monetaria, p. 329.
21. Richard Graham, Britain and the Onset of Modernization in Brazil, 1850-1914, Cambridge, 1968, p. 246.
22. Williams, Argentine International Trade, p. 137.
23. Mario O. Teijeiro, "Inversion Britanica en Argentina: Causas y Consecuencias del Panico Baring," ms., Buenos Aires, 1979, p. 10.
10. I am indebted to Juan Carlos de Pablo for having called this unpublished piece to my attention.
24. Franco, Reforma Monetaria, p. 142.
25. There is some question about the accuracy of Brazilian trade data during this period. J.F. Normano, Brazil: A Study of Economic Types, Chapel Hill, 1935, pp. 194-5, and Calogeras, p. 325, present estimates that diverge from those of the Anuario Estadístico that were used. (Beginning in 1901, there is coincidence

between all three sources.) The Anuario estimates typically are intermediate. They themselves are defective by virtue of their apparent inclusion of precious metals in the merchandise accounts. See Luiz Aranha Correa do Lago, "Balanca comercial, balanco de pagamentos e meio circulante no Brasil no Segundo Imperio: uma nota para uma revisao," Revista Brasileira de Economia, vol 36(4), out./dez. 1982, pp. 489-508, who makes corrections only for an earlier period.

I have reestimated the equations using the two alternative export series for the years that they are available. The key result, the insignificance of net capital inflows, is unaffected; indeed, in both instances, the coefficient is less significant.

26. This limited explanation of the variance contrasts with the  $R^2$  of .8 Sims obtains between money and nominal income in the original article setting forth his method. Christopher Sims, "Money, Income, and Causality," American Economic Review, vol. 62, no. 4 (September 1972), pp. 540-552.

27. "Exchange Rates in Nineteenth Century Brazil: An Econometric Model," Journal of Development Studies, Vol. 19 (no. 2), Jan. 1983, pp. 170-178.

28. The original exposition of the variance bounds test is in Robert Shiller, "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" American Economic Review, vol. 71, no. 3 (June 1981), pp. 421-436.

29. For a recent critique of Shiller's article, with references to others, and Shiller's reply, see Terry A. Marsh and Robert C. Merton, "Dividend Variability and Variance Bounds Tests for the

Rationality of Stock Market Prices," American Economic Review, vol. 76, no. 3 (June 1986), pp. 483ff.

30. This is the title, of course, of Kindleberger's recent history of financial crises, published in 1978. The reference to German foresight can be found on p. 109.

31. S.F. Van Oss, Stock Exchange Values: A Decade of Finance, 1885 to 1895, London, 1895, p. lxxvi; Kindleberger, Manias, p. 133, citing Sprague's History of Crises Under the National Banking System, reprinted New York, 1968, p. 132.

32. Roberto Cortes Conde, El Progreso Argentino, 1880-1914, Buenos Aires, 1979, Ch. 4, pp. 211 ff.

33. Adolfo Dorfman, Historia de la Industria Argentina, Buenos Aires, 1942, p. 201.

34. Laura Randall calculates the percentages in her Comparative Economic History, p. 240.

35. These data are based upon British trade statistics as presented by Eduardo A. Zalduendo, Libras y Rieles, Buenos Aires, 1974, p. 89.

36. The index is described in Eulalia Maria Lahmeyer Lobo, et. al., "Evolucao does Precos e do Padrao de Vida no Rio de Janeiro, 1820-1930 - Resultados Preliminares," Revista Brasileira de Economia, vol. 5, no. 4 (out./dez. 1971), pp. 235-266. Eliana Cardoso plots a relative price series based on that index which trends downward during the 1890s. See her "Exchange Rates in Nineteenth-Century Brazil," Journal of Development Studies, vol. 19, no. 2 (January 1983), p. 171.

Jan-87

RECENT ISSUES OF THE WORKING PAPER SERIES  
OF THE DEPARTMENT OF ECONOMICS  
UNIVERSITY OF CALIFORNIA, BERKELEY

Copies may be obtained from the Institute of Business and Economic Research. See the inside cover for further details.

- 8613 Drew Fudenberg and Jean Tirole  
NONCOOPERATIVE GAME THEORY FOR INDUSTRIAL ORGANIZATION:  
AN INTRODUCTION AND OVERVIEW  
Nov-86.
- 8614 Jeffrey A. Frankel and Kenneth A. Froot  
THREE ESSAYS USING SURVEY DATA ON EXCHANGE RATE EXPECTATIONS  
Nov-86.
- 8615 Joseph Farrell  
COMMUNICATION BETWEEN POTENTIAL ENTRANTS  
Nov-86.
- 8616 Joseph Farrell and Suzanne Scotchmer  
PARTNERSHIPS  
Nov-86.
- 8617 Wan-Jin Kim  
ON THE RATE OF CONVERGENCE OF THE CORE  
Dec-86.
- 8618 Joseph Farrell and Nancy T. Gallini  
SECOND-SOURCING AS A COMMITMENT: MONOPOLY INCENTIVES TO ATTRACT COMPETITION  
Dec-86.
- 8619 Roger L. Ransom and Richard Sutch  
TONTINE INSURANCE AND THE ARMSTRONG INVESTIGATION: A CASE OF STIFLED INNOVATION  
IN THE AMERICAN LIFE INSURANCE INDUSTRY, 1868-1905  
Dec-86.

Jan-87

RECENT ISSUES OF THE WORKING PAPER SERIES  
OF THE DEPARTMENT OF ECONOMICS  
UNIVERSITY OF CALIFORNIA, BERKELEY

Copies may be obtained from the Institute of Business and Economic Research. See the inside cover for further details.

8620 Joseph Farrell and Robert Gibbons  
CHEAP TALK IN BARGAINING GAMES

Dec-86.

8621 Robert M. Anderson  
CORE ALLOCATIONS AND SMALL INCOME TRANSFERS

Dec-86.

8722 Joseph Farrell  
COMPETITION WITH LOCK-IN

Jan-87.

8723 Pranab Bardhan and Nirvikar Singh  
MULTINATIONAL RIVALRY AND NATIONAL ARBITRAGE: SOME THEORETICAL CONSIDERATIONS

Jan-87.

8724 Albert Fishlow  
LESSONS OF THE 1890S FOR THE 1980S

Jan-87.

8725 Jeffrey A. Frankel  
THE SOURCES OF DISAGREEMENT AMONG INTERNATIONAL MACRO MODELS,  
AND IMPLICATIONS FOR POLICY COORDINATION

Jan-87.

8726 Jeffrey A. Frankel and James H. Stock  
REGRESSION VS. VOLATILITY TESTS OF THE EFFICIENCY  
OF FOREIGN EXCHANGE MARKETS

Jan-87.