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Core, Periphery, Exchange Rate Regimes, and Globalization

Michael D. Bordo and Marc Flandreau

9.1 Introduction

Historians know the crucial importance played by the boundary that separated the core of the Roman Empire from its periphery—a boundary known as the *Limes.* In addition to being a line of military defense, it was a locus of cross-influences. While the core contributed to shaping the "barbarous" lands located beyond its walls, the periphery shaped the inner areas, since protection from the dangers of military conflict involved providing for such outcomes. And for reasons that are hard to understand, the long survival of this frontier extended long after the fall of the Roman Empire: More than ten centuries after its collapse, the former *Limes* surprisingly coincided with the line that separated Christians during the religious wars, into Protestants and Roman Catholics.

In comparison with this very long-run phenomenon, the experience of the international monetary system is that of a toddler. And yet the recent turmoil in international financial markets has forced economists and policymakers to come to grips with something similar. The recent discussions on the exchange rate regimes that are advisable in order to cope with finan-

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cial instability rest on the observation that the challenges of globalization are not quite the same depending on whether we focus on developing countries and emerging markets or developed ones. Whereas the latter are free to go their exchange rate way, the former are said to face the dilemma of either anchoring themselves to core countries with extra strong glue, or remaining out of the *Limes* of modern integration with a volatile exchange rate.

As a recent literature has argued, there is a certain "fear of floating" among modern developing countries. But this is obviously *nihil novi sub sole* for economic historians familiar with that other major experience of globalization, namely that of the late nineteenth century. For then, already, there was a core that followed the high road of more or less complete gold convertibility, and an infamous periphery that had trouble pegging but resented floating. And it is striking that the list of "peripheral" nations has not changed that much over the course of the century: Today, like yesterday, it includes Latin American countries, Central Europe, Russia, and to some extent Asia—among the latter, Japan was already standing out as an exception.[1]

This persistence nonetheless conceals a profound transformation of the international monetary system—a transformation that has occurred at the core of the global exchange rate system. Today, flexible exchange rates have superseded, in advanced countries (with the notable exception of Europe) the nineteenth-century system of fixed exchange rates known as the gold standard. In other words, "globalization" appears to mean surprisingly consistent things in the periphery, but radically opposite things in the core. This may in fact sound somewhat paradoxical: In the late nineteenth century globalization was in the popular mind associated with the gold standard, and most academics concurred (Kemmerer 1916). Yet after the collapse of the Bretton Woods system in the early 1970s the heart of the global monetary system is based on floating exchange rates. How do we interpret this? On the surface, this would seem to suggest that the exchange rate system is quite irrelevant to the process of globalization: Nature finds its ways. At the same time, how do we make sense of the serious concerns that academics and policymakers have over the problem of the appropriate exchange rate system for the emerging countries? Why should there be different recipes for the advanced and the emergers?

The theoretical literature pertaining to the links between integration and

1. We use the distinction *core* versus *periphery* for the pre-1914 period following a well-established tradition in economic history. For the recent period we use the terminology *advanced* versus *emerging* countries. The difference between the two demarcations is largely geographical (the core before 1914 meant Western Europe and after 1900 the United States, whereas the periphery was everyone else). Today advanced countries are in every region. The key unifying theme for both demarcations, as pointed out by our discussant Anna Schwartz, is that (core) advanced countries are generally capital rich and the (periphery) emerging countries are generally capital poor.

exchange rate regimes generally overlooks this problem. Two opposite views may be identified. Both assume some kind of market imperfection, because in a perfectly rational and frictionless world, fixed and flexible systems should deliver identical outcomes and the question of the links between exchange rate regimes and integration would be irrelevant (Helpman 1981).

The "transaction costs" view on the one hand assumes that floating exchange rates are a risk that cannot be diversified away and thus tantamount to a distortion preventing full specialization. From this perspective a fixed exchange rate may deliver both a higher level of integration and superior economic performance. This view is very old and originates in nineteenth-century classical economics.

On the other hand, the "policy view" rests on the notion that, due to the existence of nominal rigidities and factor immobility, flexible exchange rates might be advisable to smooth out the international adjustment process: Exchange rate flexibility, from this perspective, is not an enemy to international integration. This view is traditionally associated with Robert Mundell, and Padoa-Schioppa's trilemma. It has been put to work by Barry Eichengreen to explain the (according to the recent literature, partial) trend toward fluctuating exchange rates. The expansion of democracy, by calling for an increase in income smoothing, has led more and more countries to float their way into globalization—again with the notable exception of Europe.

None of these views, however, takes seriously into account the dichotomy between core and peripheral countries. And yet the quite distinct dynamics of exchange rate regimes depending on whether we focus on the center or on the periphery suggests that different stories may have to be told for each. At the same time, as the comparison with the Roman Empire suggests, the record of the center cannot be understood without reference to the periphery, and vice versa. Systems are tested on their margins.

In this paper we seek to provide an interpretation of both the presence of "fear of floating" in the periphery and the transition to flexible exchange rates in the center. Our argument rests on the role of technological progress in money and finance. In the nineteenth century, adherence to gold provided a stable environment that contributed to the development of deep and liquid money markets. At the same time, gold convertibility was a constraint on monetary policies because it implied currency bands within which core nations sought to obtain as much room to maneuver as they could. By the 1970s, financial maturity allowed the core countries to float. In a sense in the current floating regime countries, by learning to follow a domestic nominal anchor, have been able to eliminate the credibility bands of the classical gold standard, which in its time granted the core countries only a modicum of the policy independence they have today.

By contrast to the core, many peripheral countries in the pre-1914 period

lacked what we suggest calling the "financial maturity" to successfully adhere to gold. The alternative of floating was fraught with danger because they were forced to obtain the foreign capital crucial to their development by borrowing in terms of sterling (or other core-country currencies) or else having gold clauses.

In times of financial crises, then as now, devaluations led to debt crises. Thus, we argue that peripheral countries then, as now, were forced to adopt super-hard fixed exchange rates (currency boards or close to 100 percent gold reserves then, currency boards or dollarization now) because they had not developed the financial maturity to float, or else they had to restrict foreign borrowing. Thus, the link between globalization and the exchange rate regime turns out to depend on financial maturity:[2] That is, "Tell us how financially mature you are, and we will tell you what exchange rate regime you'll end up with through globalization!"

The remainder of the paper is organized as follows. In section 9.2, we set the stage by considering the evidence on global financial integration from 1880 to 1997, using the well-known Feldstein-Horioka approach. The contribution of our work is that it combines both cross-section and time series dimensions with an extended sample of emerging countries to show a number of disturbing facts that suggest that financial globalization varies a lot depending on the type of country—core (advanced) or periphery (emerging)—and the type of regime (floating, fixed) we consider. This leads to the conclusion that financial integration today is primarily an advanced country phenomenon, while the link with the exchange rate regime is a complex one.

Section 9.3 lays out the financial maturity hypothesis and presents narrative evidence for the pre-1914 period of the different experiences of the core and peripheral countries in adhering to the gold standard.

Section 9.4 presents some empirical evidence on the link between financial depth and the exchange rate regime for core (advanced) and peripheral (emerging) countries 1880–1913 and today.

Section 9.5 summarizes our findings and suggests some lessons from history.

9.2 Financial Integration, Exchange Rate Regimes, and Hollowing Out

In this section, we use saving-investment correlation tests (Feldstein and Horioka 1980). Saving-investment (S-I) tests seek to measure the degree of

2. The main focus of our study is the exchange rate arrangements of the two periods of globalization (i.e., of open capital markets and relatively open trade). We do not take a stand on why the global system collapsed after 1918 (or, more correctly, after 1931) and was not reattained until the 1980s. We are sympathetic to the view that the deglobalization of the middle two quarters of the twentieth century had a lot to do with the disruptive "second thirty years' war" that began in 1914 and only really ended with the end of the cold war. We are agnostic on the views of those who see the breakdown of the global system as related to flaws of the gold standard and to those who see it as a backlash to the excesses of the earlier age of globalization.

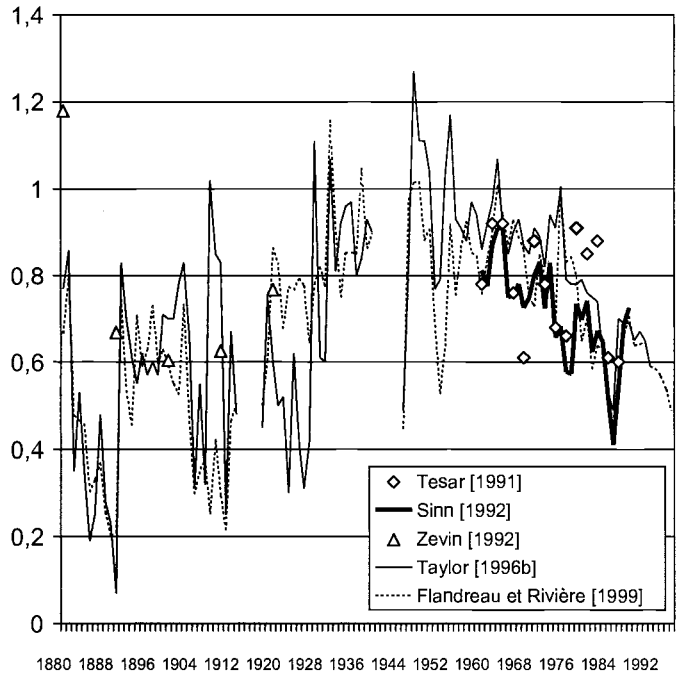

Fig. 9.1 The inverted U-shaped pattern of financial integration
Source: Flandreau and Rivière (1999).

financial integration by examining the relationship between saving and investment. Integration is high if the correlation of a regression of investment on saving is low and vice versa: In the latter case investment is constrained by domestic savings, whereas it is not in the former case. Feldstein-Horioka's analysis sparked a considerable research effort. One important area of research was the analysis of the historical behavior of correlation coefficients in order to document the historical progress of international financial integration. Standard references in this field are Bayoumi (1990), Tesar (1991), Zevin (1992), Eichengreen (1992), Obstfeld (1995), Jones and Obstfeld (1997), Bayoumi (1997), and Obstfeld and Taylor (1998).[3] These works outline the now famous inverted U-shaped pattern of financial integration, which is obtained when one plots the results from a series of annual cross-section regressions for the period 1880–1995 (fig. 9.1).[4] The message

3. See Flandreau and Rivière (1999) for a survey.

4. The countries were Argentina, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Iceland, Italy, Japan, Luxembourg, Norway, New Zealand, the Netherlands, Portugal, Russia, Spain, Sweden, Switzerland, the United Kingdom, and the United States. For data sources see appendix to Flandreau and Rivière (1999), available on request.

seems to be that, after the interruption of the interwar years, the world is heading toward reglobalization that recalls nineteenth-century patterns. We refer to this as the "folk view."

9.2.1 Taking Panel Econometrics Seriously

We seek to show that this wisdom is too simple and conceals a number of finer phenomena. This is done by extending existing analyses in two critical directions. First, we supplement the traditional cross-section regressions by panel estimates. Second, when this can be done (i.e., for the post-1973 period) we supplement the traditional group, of primarily advanced countries that researchers have been looking at, with a large sample of emerging countries.

The importance of panel econometrics for analyzing S-I correlation was emphasized by Krol (1996), Coiteux and Simon (2000), and Flandreau and Rivière (1999). Panel data such as those used in Feldstein-Horioka (FH) regressions have two dimensions. Research on the long-run behavior of S-I regressions has focused on the interindividual dimension, computing cross-section regressions either on annual data on or individual averages for given periods. These latter estimates are known as between-estimates. They may be thought of as generalizations of pointwise cross-section regressions.

One problem with between-estimates, though, is that they introduce a number of biases in the estimation technique. For instance, they tend to overestimate "true" disintegration when current accounts experience frequent reversals, because averaging wipes out those reversals. This is why "within"-estimates are in our view a much sounder measure, because they highlight an essential dynamic dimension of financial integration by focusing on the ability of countries to finance *changes* in their current account position. Indeed, within estimates measure whether increases in investment above average can occur without running into an investment constraint. A third possible estimate, known as "pooling," gives equal weight to the time and individual dimensions.

Figure 9.2 shows the results of computing triplets of estimates (pooling, within, between) for the standard subperiods people have focused on and for the typical group of countries for which such estimates have been computed before. As can be seen, while the popular inverted U-shaped pattern is discernible, the precise picture depends on the estimator used.

Although the three estimates give a similar picture for the pre-1914 period, within-estimates suggest that the interwar was less closed than has been assumed, probably because the frequency of current account reversals during those years tends to average out the countries' short-term ability to use foreign capital. Moreover, we observe huge discrepancies among the various estimates for the period after 1973. This suggests that although some countries have dramatically increased their ability to use the foreign capital market, the sample's ability at financing current account imbalances has increased much less. In what follows we shall accordingly give special

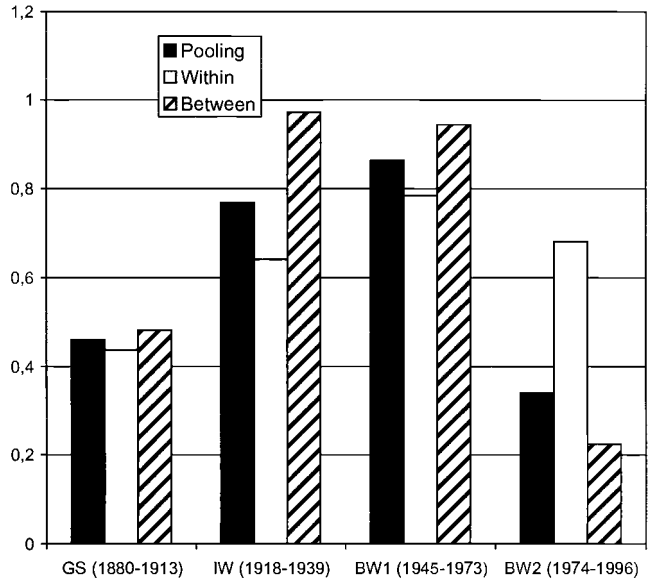

Fig. 9.2 Integration coefficients: Folk sample

weight to the within-estimates, which might sound as a better measure,[5] although for the sake of completeness, we will report all three measures.

9.2.2 Regimes of Financial Integration

Having emphasized the importance of panel estimates, our strategy is the following: Using a sample similar to the one previous scholars have worked with, we replicate benchmark estimates of S-I correlation by subperiods and compare these with the estimates one obtains for subgroupings that we think may be relevant, because they were characterized by arrangements implying exchange rate stability.[6]

In this fashion, we identify (a) gold countries before 1914; (b) gold countries, gold bloc members, and sterling area members in the interwar; (c) countries that pegged to the dollar under the fixed Bretton Woods era;[7] and (d) members of the European exchange rate mechanism (ERM) after 1979.[8]

5. As will be seen, the standard errors of between-estimates are always larger than those of the two alternative estimators.

6. Our sample only differs from the existing one in that some corrections were made. For instance, the sample used by Eichengreen, Taylor, and others has France importing capital before 1914; whereas Lévy-Leboyer shows that it was exporting. See Flandreau and Rivière (1999) for a discussion of alternative samples.

7. We identified the arrangements using data from Bordo and Schwartz (1996), Bordo (1993), and Ghosh et al. (1995).

8. We compute this restriction rather than a restriction to fixed exchange rate regimes because of problems with identifying these regimes to which we return to below.

Our goal is to see whether these groupings succeeded in achieving significantly higher levels of integration than the sample at large. The intuition is that, if exchange rate stability is an instrument meant to unlock participating countries' current account constraints, then we should observe lower betas for subgroupings than for the sample at large (see fig. 9.2).

Table 9.1 displays the results.[9] They show that for the pre–World War I period, countries that strictly adhered to gold do not seem to have been able to achieve a significantly greater degree of financial openness than those who did not. The estimated beta for both the entire population and the restricted sample shows figures that are very close to each other so that it is impossible to reject the null that they are the same.

The interwar years reveal an interesting pattern: We see that countries that adhered to gold, as well as members of the sterling zone, actually achieved less integration than the international average reported in table 9.3. The straightforward interpretation of this is probably that members of the interwar gold standard could only retain membership through capital controls, thus actually achieving less integration than the sample at large. A similar result is in fact obtained for the Bretton Woods period, probably for the very same reason.

Finally, moving to the recent experience, we see that ERM membership did succeed in reducing the beta parameters compared to the entire sample.[10] At the same time, since we know that the making of the euro was accompanied by a companion capital movement liberalization within European countries, it is not clear whether the greater integration is due to exchange rate stability or to lower controls.

At this stage, one forceful conclusion that emerges is that fixed exchange rate regimes were not in the nineteenth century an instrument for financial integration. Financial integration has been directly related to the presence or absence of capital controls, and these controls have been used in periods of both fixed and flexible exchange rates. The pre-1914 period stands out as one that was exceptionally free from these controls rather than one whose globalization was related to exchange rate stability since, as observed, the restriction of the integration coefficient to those countries that did not float is not higher than the one obtained by the entire sample. In fact, it is quite striking to see that even with fixed exchange rates, even with no capital controls at all, the degree of integration achieved was not perfect. We think that these findings are consistent with the notion that globalization in the nineteenth century caused the adoption of the gold standard, rather than the

9. Similar results can be found in Flandreau and Rivière. The only difference comes from minor updates in the database.

10. In this part, we use the folk sample. The very low pooling and between-estimates come from the inclusion of Luxembourg. Results without Luxembourg are respectively P: 0.700, W: 0.521, B: 0.819, and for the restriction to Europe P: 0.551, W: 0.502, B: 0.664. As can be seen, the within-estimates are much more robust than the between and pooling.

Table 9.1 **Financial Integration: Benchmark Estimates and Fixed Exchange Rates Restrictions (folk sample)**

	Classical Gold Standard (1880–1913)	Interwar (1918–1939)	Bretton Woods 1: Gold Dollar (1945–1973)	Bretton Woods 2: Float (1974–1996)
Benchmark estimates	P: 0.460 (0.030) ***W: 0.437 (0.030)*** B: 0.482 (0.184)	P: 0.768 (0.027) *W: 0.641 (0.030)* B: 0.971 (0.082)	P: 0.863 (0.019) *W: 0.784 (0.022)* B: 0.944 (0.090)	P: 0.339 (0.026) *W: 0.681 (0.106)* B: 0.224 (0.035)
Restriction to gold standard	P: 0.445 (0.038) *W: 0.475 (0.037)* B: 0.459 (0.211) *N* = 433 (15 countries)	P: 1.015 (0.066) *W: 0.876 (0.082)* B: 1.082 (0.096) *N* = 59 (10 countries)		
Restriction to sterling zone		P: 0.808 (0.048) *W: 0.804 (0.088)* B: 0.854 (0.110) *N* = 63 (8 countries)		
Restriction to gold standard + gold bloc		P: 0.943 (0.049) *W: 0.864 (0.056)* B: 1.002 (0.106) *N* = 82 (11 countries)		
Restriction to gold bloc		P: 0.693 (0.055) *W: 0.676 (0.060)* B: 0.677 (0.216) *N* = 19 (3 countries)		
Restriction to dollar standard (IMF data)			P: 0.932 (0.025) *W: 0.809 (0.030)* B: 1.042 (0.088) *N* = 372 (17 countries)	
Restriction to exchange rate mechanism			P: 0.089 (0.028)	*W: 0.316 (0.057)* B: 0.0944 (0.099) *N* = 196 (13 countries)

Source: Authors' computations (see text).

other way round, and the remainder of the paper shall seek to develop this intuition.

9.2.3 Expanding the Horizon: Developed and Emerging Integration since 1973

In order to go beyond these findings, we extend existing analyses in a second direction. We seek to expand the folk sample used in the literature (essentially, developed countries plus Argentina) to include for the more recent period a large number of emerging countries in Asia and Latin America. Although data availability limits the number of emerging countries that can be identified during the late nineteenth century (and thus the significance of tests conducted on more limited samples), such is not the case for the more recent period. This enables us to make systematic comparisons between performances in the core (advanced) and in the periphery (emerging).[11] For this purpose we constructed an expanded database comprising forty-six countries and spanning the period 1973–98. The folk database is embedded in this broader set.[12] To document the properties of the expanded sample, we run cross-section regressions for the period after 1973. As can be seen in figure 9.3, the trend toward greater financial integration after 1973 captured by estimates based on the folk sample (the right part of the inverted U) mostly reflects the properties of the sample itself. In other words, it shows that there was indeed a process of financial integration, but this process varied a lot along the individual dimension, as illustrated by the increase in the cross-section correlation for emerging countries in the second half of the 1980s. Moreover, extracting from the sample countries belonging to the European Union shows that the trend toward greater integration that many authors have emphasized is truly a story about European integration. The disproportionate share of European nations in the sample has led scholars—unknowingly—to eurocentric conclusions.

In line with the previous discussion, however, it is obvious that one cannot restrict one's attention to these cross-section estimates, as telling as they are. In a second stage, we thus use our new sample to compute benchmark estimates and test in a second stage whether restrictions to given exchange rate regimes are associated with higher or lower levels of integration.

The identification of exchange rate regimes is more complex today than it was one century ago when the choice was between paper and gold. We decided to rely on the Masson and Levy-Yeyati and Sturzenegger (LYS) clas-

11. Earlier exercises in Flandreau and Rivière (1999) based on the Folk's sample plus five emergers suggested that the record of peripheral countries might be different from that of developed ones.

12. The additional countries are Brazil, Chile, China, Colombia, Egypt, Hong Kong, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Peru, the Philippines, Poland, the Czech Republic, Russia, Singapore, South Africa, South Korea, Thailand, Turkey, Uruguay, and Venezuela. For data sources, see data appendix to Flandreau and Rivière (1999), available on request, and the IMF's *International Financial Statistics*.

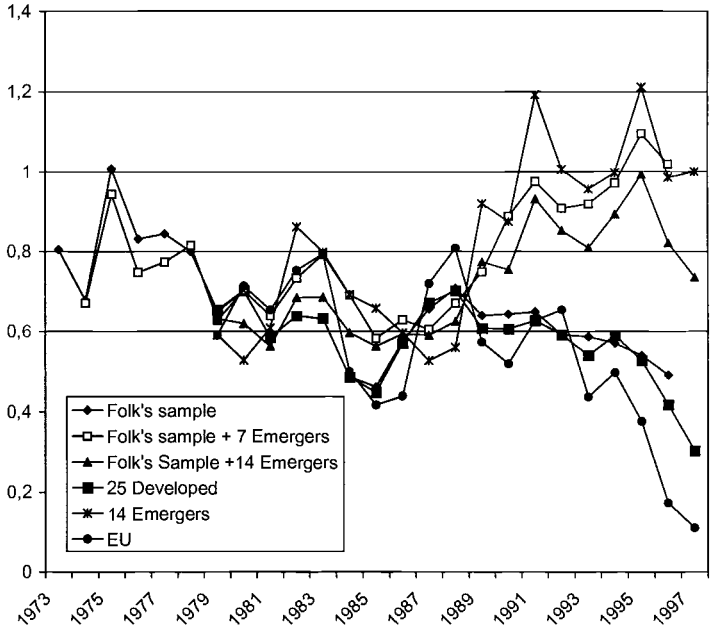

Fig. 9.3 Financial integration 1973–97: Difference between advanced and emerging countries

sifications of countries by type of exchange rate regime (Masson 2001; LYS 2001). Both provide country classifications that recognize that modern exchange rate regimes can be of the fixed, floating, or intermediary category. Since one needs to cross the information available in our sample and that available in either the Masson or LYS databases, one is bound to lose some countries or observations in the process. We end up with two restricted databases of forty-two (Masson) or thirty-five (LYS) countries, whose properties, when one considers both samples in their entirety, are almost identical.[13]

The Masson classification works with the International Monetary Fund (IMF) categories but follows an earlier IMF study by Ghosh et al. (1995) which demarcated the IMF's twenty-six categories into just three (flexible, intermediate, and floating).[14] Masson rearranges the Ghosh categories by defining *flexible* as strictly independent floats and *fixed* as hard pegs (currency boards and announced pegs with no change in parity), with the remainder classified as intermediate. As a result Masson has a much smaller

13. We checked this by running pooling-within-, and between-estimates. Results (available upon request) are virtually identical, a result of the broad overlap between the two samples.

14. Flexible arrangements included crawling pegs, target zones, managed floats, and independent floats. Pegged arrangements include single currencies, special drawing rights (SDR) pegs, other official basket pegs, and secret pegs.

number of truly fixed or truly flexible regimes, with the bulk of the sample being made of intermediate regimes.

The LYS indicators use measures of the volatility of exchange rates and international reserves and cluster analysis to classify countries into four groups (floating, dirty floating, crawling pegs, and fixed).[15] The classification is based on the theoretical prior that countries that really float should have greater exchange rate volatility and smaller international reserve movements than those that do not. We further classified the LYS classification into three by combining dirty floats and crawling arrangements into an intermediate category. Thus, our rearrangement of the LYS classification gives much weight to the tails.

The results we get from these exercises are documented in table 9.2. First, it appears that there are several patterns of financial integration. We find important distinctions among emergers, and also among regimes. In practice, whereas Asian countries are less financially open than the average, Latin American nations are more open for both the Masson and LYS databases.

The effects of alternative exchange rate regimes on financial integration are also interesting. Developed countries are more integrated when they fix, but to a certain extent also when they float, at least according to LYS. This is interesting because floating developed countries are typically made of large mature economies with sophisticated financial systems, such as Great Britain or the United States, whereas fixing developed countries typically include small open economies such as Austria.

We take these results as illustrating how financially deep economies, while floating, can nonetheless achieve high levels of financial integration that can compare with nineteenth-century gold standard records. On the other hand, smaller countries may find themselves opting for a fixed exchange rate regime because they are very open rather than being open because they have a fixed exchange rate system.

Emerging countries face varied experiences: As can be seen from the Masson database, emerging Latin countries are highly integrated at both ends of the exchange rate regime spectrum, with intermediate regimes being less integrated. Something similar is also perceptible in the LYS database, especially if we recall the greater significance we attach to the within-estimates. For Asian countries, by contrast, the opposite is obtained: There, intermediary regimes correspond to comparatively higher, not lower, levels of integration than extreme floats or fixed regimes. However, even for the intermediate category the degree of integration achieved is very low.

This certainly gives support to Fischer's view that developing countries, which are not very exposed to international capital flows, have the opportunity to adopt intermediate exchange rate options (Fischer 2001). To us,

15. They also have another category, called "inconclusive," which results from the statistical technique employed, and which we omit in our classification scheme.

Table 9.2 **The World According to Masson and Levy-Yeyati and Sturzenegger**

	Total	Fixed	Intermediate	Floating
		A. Masson (1973–97)		
Total sample	P: 0.703 (0.018) W: 0.527 (0.025) B: 0.812 (0.053) *N* = 1017 (42 countries)	P: 0.441 (0.128) W: –0.102 (0.220) B: 0.672 (0.164) *N* = 42 (5 countries)	P: 0.747 (0.021) W: 0.511 (0.029) B: 0.866 (0.056) *N* = 774 (39 countries)	P: 0.625 (0.034) W: 0.584 (0.057) B: 0.654 (0.117) *N* = 198 (countries)
Developed	P: 0.718 (0.027) W: 0.737 (0.036) B: 0.704 (0.101) *N* = 550	P: –0.251 (0.202) W: 0.295 (0.228) B: n.a. *N* = 21 (2 countries: 3 et13)	P: 0.736 (0.038) W: 0.654 (0.045) B: 0.837 (0.104) *N* = 377 (19 countries)	P: 0.661 (0.031) W: 0.648 (0.059) B: 0.711 (0.110) *N* = 150
Total emerging	P: 0.793 (0.032) W: 0.615 (0.044) B: 0.911 (0.095) *N* = 341	P: 0.446 (0.198) W: –0.153 (0.344) B: 0.676 (0.237) *N* = 19 (3 countries: 25.36.46)	P: 0.838 (0.031) W: 0.615 (0.046) B: 0.929 (0.096) *N* = 278 (16 countries)	P: 0.294 (0.149) W: 0.454 (0.141) B: –0.146 (0.404) *N* = 43 (5 countries)
Emerging Asia	P: 0.833 (0.060) W: 0.850 (0.080) B: 0.814 (0.146) *N* = 107	n.a.	P: 0.757 (0.079) W: 0.826 (0.085) B: 0.610 (0.128) *N* = 87 (5 countries)	P: 1.621 (0.037) W: 1.621 (0.370) B: impossible *N* = 18 (1 country)
Emerging Latin America	P: 0.521 (0.046) W: 0.478 (0.057) B: 0.603 (0.159) *N* = 176	P: 0.455 (0.209) W: –0.311 (0.357) B: n.a. *N* = 15 (2 countries: 25, 46)	P: 0.573 (0.049) W: 0.516 (0.052) B: 0.623 (0.210) *N* = 150 (8 countries)	P: –0.277 (0.097) W: –0.411 (0.107) B: –0.061 (0.152) *N* = 10 (3 countries)

(*continued*)

Table 9.2 (continued)

	Total	Fixed	Intermediate	Floating
		B. Levy-Yeyati and Sturzenegger (1973–97)		
Total sample	P: 0.727 (0.021)	P: 0.542 (0.069)	P: 0.766 (0.037)	P: 0.625 (0.035)
	W: 0.617 (0.028)	W: 0.196 (0.091)	W: 0.481 (0.058)	W: 0.395 (0.058)
	B: 0.808 (0.071)	B: 0.766 (0.137)	B: 0.810 (0.080)	B: 0.652 (0.091)
	N = 848 (35 countries)	N = 129 (16 countries)	N = 386 (29 countries)	N = 393 (31 countries)
Developed	P: 0.685 (0.029)	P: 0.487 (0.113)	P: 0.526 (0.057)	P: 0.636 (0.040)
	W: 0.699 (0.038)	W: 0.164 (0.119)	W: 0.615 (0.097)	W: 0.413 (0.074)
	B: 0.676 (0.119)	B: 0.743 (0.283)	B: 0.578 (0.096)	B: 0.583 (0.119)
	N = 467 (18 countries)	N = 84 (9 countries)	N = 83 (10 countries)	N = 238 (16 countries)
Total emerging	P: 0.756 (0.031)	P: 0.476 (0.097)	P: 0.794 (0.043)	P: 0.801 (0.055)
	W: 0.562 (0.043)	W: 0.224 (0.148)	W: 0.463 (0.071)	W: 0.552 (0.078)
	B: 0.884 (0.086)	B: 0.658 (0.128)	B: 0.869 (0.100)	B: 0.958 (0.128)
	N = 357 (16 countries)	N = 45 (7 countries)	N = 168 (16 countries)	N = 135 (14 countries)
Emerging Asia	P: 0.723 (0.065)	P: 0.704 (0.072)	P: 0.698 (0.087)	P: 0.856 (0.192)
	W: 0.850 (0.080)	W: 0.895 (0.128)	W: 0.507 (0.123)	W: 0.932 (0.255)
	B: 0.791 (0.130)	B: 0.630 (0.099)	B: 0.877 (0.161)	B: 0.774 (0.096)
	N = 112 (5 countries)	N = 17 (3 countries)	N = 69 (5 countries)	N = 23 (3 countries)
Emerging Latin America	P: 0.523 (0.046)	P: 0.440 (0.149)	P: 0.339 (0.064)	P: 0.603 (0.079)
	W: 0.480 (0.055)	W: 0.168 (0.217)	W: 0.454 (0.081)	W: 0.406 (0.074)
	B: 0.611 (0.168)	B: 0.652 (0.049)	B: 0.376 (0.159)	B: 0.917 (0.279)
	N = 184 (8 countries)	N = 22 (3 countries)	N = 77 (8 countries)	N = 82 (8 countries)

Source: Authors' computations.
Note: n.a. = not available.

these results clearly support the notion that more open countries will end up either in a fixed exchange rate system or in a flexible one.

To sum up, we found that a large part of the extensive integration that the advanced countries have achieved has to do with European integration that has been able to drive Europe over and beyond what has been achieved elsewhere under both fixed and flexible exchange rates. We think that this should be seen as a result of the liberalization of financial services, which Europe has implemented, rather than as a result of the exchange rate regime per se. A number of advanced floaters have in effect been quite good at implementing financial openness: Although a fixed exchange rate regime in advanced countries often goes with higher integration, a flexible one might do quite well too.

Moreover, our results support the hollowing-out hypothesis for emerging countries, since they show that the trend toward greater integration has split Latin America into two groups, where financial integration has in turn forced the adoption of either floating or fixed exchange rate regimes. By contrast, Asia has been able to retain intermediate and both fixed and floating exchange rate regimes because it has remained on average more financially closed than the rest of the world.

In other words, the exchange rate regime is a product of globalization, and globalization has caused a polarization between floating and fixed exchange rates—a process known as hollowing out. Only those who have maintained a degree of financial insulation have been able to postpone the choice. Again, globalization appears to have been the driving force.

9.3 Brave New World: Is Financial Vulnerability a Discovery of the 1990s?

The previous section has suggested that causality goes from globalization to the exchange rate regime.[16] In this section, we carry on with this line of analysis. We survey the recent literature on exchange rate regimes and financial crises and argue that it has a lot to say about nineteenth-century macroeconomic problems.

9.3.1 Exchange Rate Regimes and Financial Crises: The Modern Literature

The experience of both advanced and emerging countries on financial crises teaches us that pegged exchange rates invariably succumb to speculative attacks. From a theoretical point of view, this can be explained as a re-

16. In a previous draft of this paper we used gravity equations to analyze the relationship between trade integration and the exchange rate regime. Our results for the 1880–1919 period complement those presented above for financial integration and the exchange rate regime. We found, among other things, that exchange rate volatility did not significantly hinder bilateral trade, and although adhering to gold was associated with greater trade, it seems as if this is explained by deeper institutional forces at work.

sult of growing tensions between the peg and domestic economic conditions (Krugman 1979; Obstfeld 1984). The general lesson seems to be that the only alternatives in the face of mobile capital are floating or a hard fix such as a currency board, dollarization, or membership in a monetary union.

Thus, the "corner solutions" literature has developed on the notion that emerging countries (and to a certain extent developed ones as well) must choose between fixed and floating regimes, but cannot durably remain in any intermediary system. More fundamentally, the flexible corner has come under further attack in the "fear of floating" literature—according to which seemingly flexible countries do not truly float, because in effect, such a policy is for them both inefficient and dangerous. The argument runs as follows: In principle, a country that experiences a shock can adjust by lowering the exchange rate. This is supposed to enable that country to enjoy transitorily lower interest rates so that output may recover. But according to Hausmann et al., (1999), this aspirin, although it may have been good medicine for European nations in the 1990s, in effect gives headaches to Latin American countries. According to this view, the record for Latin American countries is that letting the exchange rate go forces an increase in interest rates and causes a major decline of output.

This is because exchange rate depreciation in turn triggers a capital flight, perhaps because that country relies heavily on foreign capital (so that exchange rate depreciation signals serious problems ahead). Another mechanism goes through the share of external debt that is denominated in a foreign currency. Today, only a very limited number of about twenty-five countries can issue debt in their own currency. As a result, exchange crises may cause a debt crisis. In such a setting, emerging markets would be better off pegging, even if rampant "peso" problems imply for them that pegging, whatever the amount of glue they use, does not automatically buy lower interest rates. At least, the argument goes, countries doing so would be protected from short-term external disturbances, which they would not have to shore up against.

9.3.2 Credibility, Interest Rates, and Monetary Policy

For students of the gold standard, it is striking how familiar the modern view sounds, if only we look carefully at the record. The European aspirin, on the one hand, closely resembles what a large body of literature has described as the normal state of affairs for core members of the gold standard. Because exchange depreciation (be it the result of suspended convertibility or a widening of the gold bands through the well-known "gold devices") was not expected to last,[17] these nations, often also the more developed ones, enjoyed a measure of short-term policy flexibility that enabled them

17. This is the logic of what Bordo and Kydland (1995) refer to as the gold standard as a contingent rule.

to buffer transitory shocks, very much in the same fashion modern developed floaters can: Exchange rate depreciation did not induce capital flight.

Recent tests have suggested that in effect, support was provided by the market itself, which took bets on the eventual reappreciation of the currency, thus enabling monetary authorities to lower interest rates and thus compensate for declining output; in other words, the gold points served as a credible target zone (Hallwood, MacDonald, and Marsh 1996; Bordo and MacDonald 1997). Working with data from the Vienna forward market, Flandreau and Komlos (2001) have shown that modern target zone theory was in fact invented and successfully applied in Austria-Hungary in the early twentieth century, once it had stabilized its currency. In the case of large foreign shocks (such as during the crisis of 1907) Austria-Hungary would let its exchange rate go. This triggered stabilizing expectations that enabled the monetary authorities to keep a lower interest rate than abroad, with speculators taking bets on an eventual reappreciation.

Thus, to a certain extent, the current trend toward floating in advanced countries has some resemblance to a classical gold standard in which the fluctuation margins have been, in line with Keynes' (1931, 314–31) proposal, widened to give more flexibility. The key difference between then and now is that the nominal anchor—gold parity, around which the target zone operated—has been jettisoned and a domestic nominal anchor has been substituted in its place, which allows exchange rate flexibility without the constraints of a target zone. Thus if the degree of flexibility compared to the gold standard is greater, the spirit is the same, a point to which we will come back later.[18]

This possibility for the core countries of the classical gold standard era to actually manage the money supply despite the gold constraints is in sharp contrast with what countries in the European periphery, in Asia, or in Latin and Central America could do.

On the one hand, floating did not create much room for them to conduct active monetary policies. Exchange depreciation often triggered expectations of further depreciation rather than expectations of eventual stabilization. For instance, Flandreau and Komlos (2001) show that, intriguingly enough, it was the stabilization of the Austro-Hungarian currency that opened the door to active monetary policies. During the infamous period of exchange rate gyrations that extended until the mid-1890s, exchange depreciation was not usually followed by expectations of an eventual recov-

18. Thus, we are not arguing that monetary authorities are following a target zone approach, as advocated by (for example) Bergsten and Williamson (1983). Rather, we are arguing that the credibility of adhering to gold convertibility gave the core countries before 1914 the flexibility to conduct discretionary policy within the gold points as if they were operating in a target zone à la Krugman (1991) and Svennson (1994), whereas today the credibility attached to following monetary rules such as inflation targeting gives the monetary authorities the freedom to operate with much greater flexibility without the bands of a target zone.

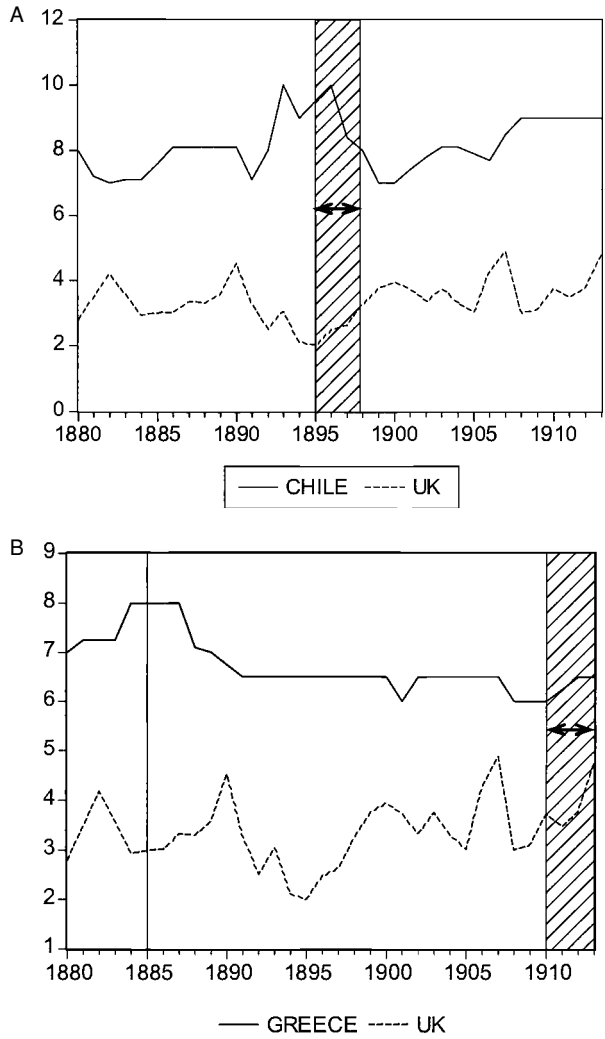

Fig. 9.4 Short-term interest rates (bank rates), 1880–1913, compared to United Kingdom: *A,* Chile; *B,* Greece; *C,* Portugal; *D,* Russia; *E,* Italy

Source: See appendix.

Note: Shaded areas represent periods when each country was on the gold standard.

ery—unlike what would happen when the country regained credibility after joining the gold standard in 1896.

On the other hand, going onto gold did not buy immediate credibility, as illustrated by the levels of short-term interest rates in a number of typical members of the periphery. Figure 9.4 shows that the weaker members of the gold club faced higher short-term interest rates *even when on gold* than is

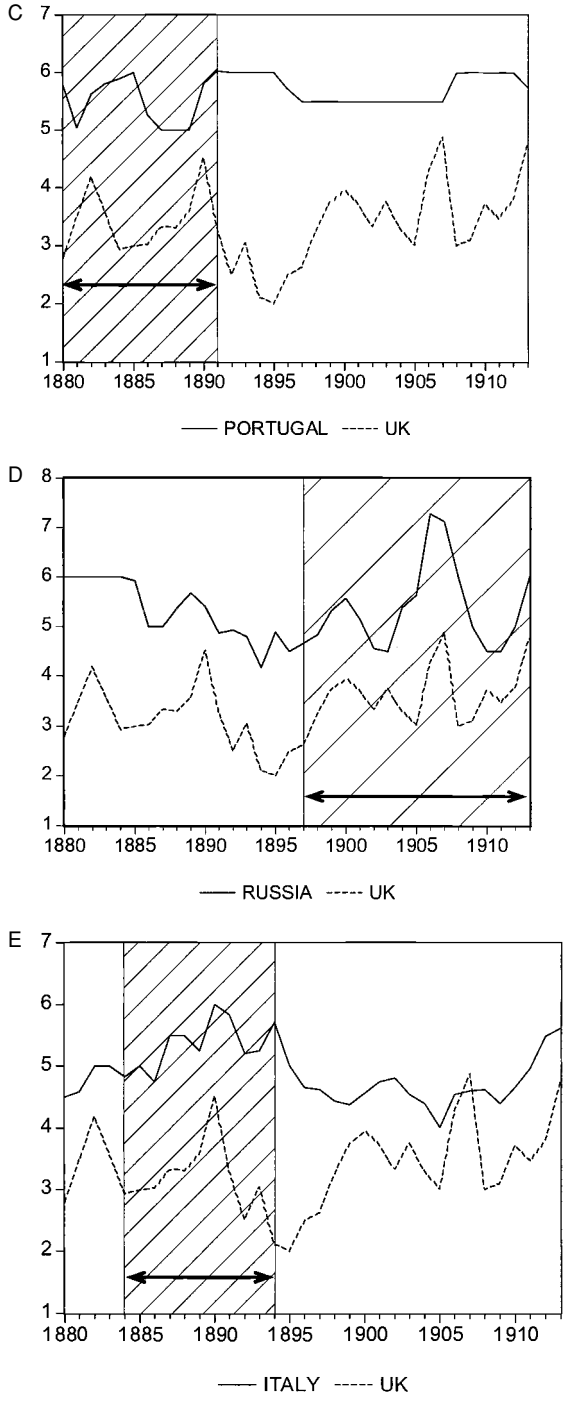

Fig. 9.4 (continued)

consistent with their actual exchange rate record. This suggests some kind of peso problem. The high short-term rates faced by Chile, Greece, Portugal, Italy, or Russia during their more or less extended flirt with gold suggest that the problems that the modern periphery has with pegging have nineteenth-century precedents. The fact that even when on gold these countries could face high short-term interest rates might explain why some of them ended up floating. An interesting case from that perspective is Chile, whose attempt at returning onto gold in 1895–98 involved both a sharp increase in interest rates—because that decision was not credible—and a substantial fall in the rate of inflation, with the result that the stabilization was associated with huge real interest rates, recession, and a quick reversal to floating exchange rates (Subercaseaux 1926). *Plus ça change* . . .

9.3.3 Fear of Floating, Nineteenth-Century Style: A New View of the Gold Standard

If going on gold was so costly for the periphery, one may wonder why a number of countries nonetheless sought to stick to gold. We argue that this choice rested on something quite similar to the current fear-of-floating dilemma. If fixing was quite painful under the gold standard for many of the peripheral countries, floating could be just as deadly as today. This was due to pervasive problems of currency mismatch arising from the inability, for underdeveloped borrowing countries, to issue foreign debts in their own currency.

It is well known from the works of historians that the financial markets of the less developed countries were very backward.[19] This led governments of the European or Latin American periphery to issue their debts in the large financial markets of the core countries, such as London, Amsterdam, Paris, or later Berlin, which by contrast had developed early on (Neal 1990). In effect, the investors in peripheral countries developed the habit of holding that part of their wealth which they invested in domestic bonds in the large markets of the core countries (Broder 1975; Lévy-Leboyer 1976; De Cecco 1990).

Borrowing abroad also implied borrowing in foreign currencies. Today, many emerging countries find it impossible to borrow abroad in their own currency. Ricardo Hausmann and various co-authors[20] refer to these nations as suffering from "original sin." Something similar existed one century ago. According to John Francis (1859), exchange rate guarantees in international bond issues were an innovation that had been pioneered by the London Rothschilds.[21] The guarantees were widely used during the boom

19. See Rousseau and Sylla (ch. 8 in this volume).

20. See Hausmann et al. (1999), Hausmann, Pannizza and Stein (2000), Fernandez-Arias and Hausmann (2000), and Eichengreen and Hausmann (1999).

21. Previous to the advent of Mr. Rothschild, foreign loans were somewhat unpopular in England, as the interest receivable abroad, subject to the rate of exchange, liable to foreign caprice, and payable in foreign coin. He introduced the payment of the dividends in England, and fixed it in sterling money, one great cause of the success of these loans in 1825" (298–99). See also Ferguson (1998, 132–34).

of Latin American bond issues of the 1820s (Fodor 2000). As foreign investment soared, this practice became widespread. Prior to the advent of the gold standard, countries were alternatively tied to gold, silver, or bimetallic currencies depending on the market they were tapping. With the spread of the gold standard in Western Europe, gold clauses generalized.[22]

Fully comprehending the logic of these gold clauses is a theoretical challenge that is beyond the scope of this paper. It is not clear, for instance, why investors should have preferred a lower exchange rate risk—but with a greater default risk when exchange rate crises occurred—to a higher exchange rate risk but a lower risk of default.

One possible answer is that, in a system where instruments to hedge against long-run exchange rate risks were not available, the clauses enabled foreign investors to pass on the costs of exchange risk to issuing governments or corporations.[23] This was one way contemporaries rationalized this practice, emphasizing that it was motivated by the risk aversion of foreign investors.[24] But this would imply that contemporaries were more willing to run default risk than exchange rate risks.

Second, this practice might be understood as the solution to a commitment problem. While local issues could be easily inflated away, foreign issues with gold clauses provided safeguards, precisely because they in turn induced governments to be on their guard (Missale and Blanchard 1990).

22. Flandreau (2002) argues that this contributed to tying countries to the monetary system of the financial center on which they depended, thus contributing to the emergence of regional groupings such as the Latin Union.

23. There were forward exchange markets, but only for a small number of currencies, and only for short horizons (Einzig 1937). We are not aware of swap contracts that would have involved long-term cover against exchange rate risk. The only kind of protection against exchange rate volatility would have been diversification, which by definition does not provide full insurance.

24. On Russia see de Block, (1889, 214): "Pour décider ces capitalistes à engager leurs fonds dans une entreprise dont l'avenir pour eux état incertain, il fallut leur garantir un minimum normal de revenu annuel sur les actions et obligations de chemins de fer russes, en fixant ce minimum sur l'étalon métallique" (In order to convince capitalists to put their money in projects whose success was for them uncertain, it was necessary to provide them with a guaranteed minimum revenue on their railway bonds and stocks and to index this minimum on a metallic standard). On Spain, Austria, and Hungary see Lévy (1901, 6): "Chez nous surtout où les rentiers quelque peu timorés et mal au courant des questions de change ont marqué de tout temps une grande répugnance à admettre dans leur portefeuille des titres don't le revenu ne fût pas stable; la première condition de cette fixité du coupon étant celle de la monnaie la conséquence naturelle de cette exigence légitime de notre public a été la création de monbreaux titres étrangers stipulés payables en francs ou en or. L'un des premiers a été la rente espagnole extérieure 3% depuis transformée en 4%; puis sont venues les rentes autrichiennes 4% or, la rente hongroise 6% or" (In our country where rentiers are risk averse and not very conversant in exchange matters and have always been reluctant to take in their portfolio bonds whose income is variable [and a necessary condition for revenue stability is the stability of the currency], francs or gold clauses emerged as a natural requirement in many bond issues. One of the first was the Spanish rente 3 percent, then came the Austrian 4 percent, the Hungarian 6 percent). On the United States, see Wilkins (1989, 619): "Often sovereign investors insisted on gold clauses in railroad bonds. They wanted 'sound money' in America and worldwide. The US adherence to a gold standard (after 1879) was in part a consequence of America's desire to attract such investment."

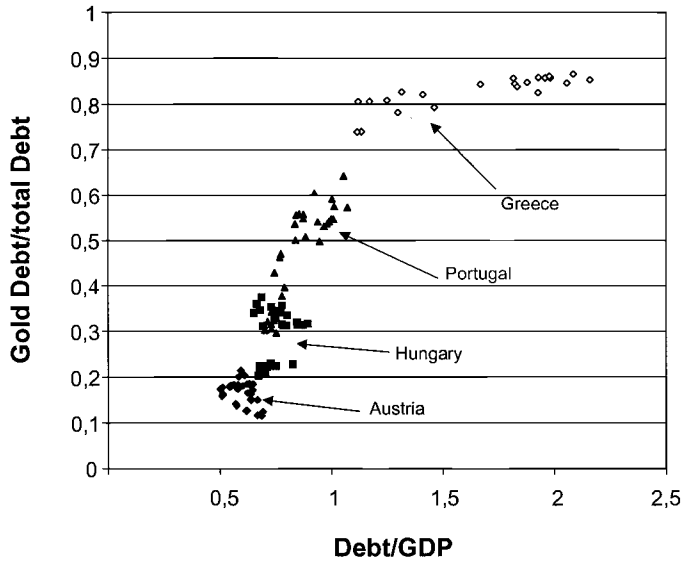

Fig. 9.5 Total indebtedness and currency mismatch: Austria, Hungary, Portugal, Greece, 1880–1913

Source: Crédit Lyonnais Archives as adapted by the authors.

Figure 9.5 gives some support to this view because it shows that the share of gold debt was an increasing function of total indebtedness for a number of peripheral countries. On the other hand, it is hard to determine the extent to which markets and governments were in a position to internalize the consequences of gold clauses plus exchange depreciation: In the politically unstable, revolution-driven Latin America, could precommitment actually work? Moreover, although commitment might explain why some debt would have been issued with gold clauses, it is not clear why all debt issued abroad should have included such clauses.

A final possibility rests in the motivations of international bankers whose syndicates arranged the loans. Because the bankers offered a number of services to cash-strapped government in periods of crisis, lending into arrears and helping them to muddle through financial trouble, they were also in a position to impose a lot of conditionality (Flandreau 2002). This asymmetry was often emphasized by contemporary observers: According to Lévy, "The creation of debts denominated in the currency of the lending country can be understood as resulting from the fact that it is the lending country that dictates its conditions to the borrowing part" (1901, 6). It must be that the bankers expected that the bonds they were prepared to guarantee would face a deeper and more willing demand as a result of the gold clauses, and they thus persuaded borrowers to issue their securities with fixed exchange rate clauses that tied the coupon to the unit of the market where the bonds

were sold.[25] But then we are back to the question, why shouldn't the regular investor be willing to hold paper debts, provided he gets a return for it?

In any case, given the situation, the fixed exchange rate clauses drew a sharp line between those members of the core where there had been a long record of adherence to a convertible standard and those who did not. As one leading financial economist of the time explained, robust gold convertibility was an acceptable substitute for the gold clauses: "When it comes to the bonds of countries where the gold standard prevails, such as Great Britain, Sweden, Norway, Denmark or Canada, special clauses are not necessary, since the obligation to pay in gold results from the fact that bonds are denominated in the currency of that country" (Lévy 1901, 6).

This was certainly a reason why a number of countries became quite interested in trying to find ways to stabilize their currency in terms of gold. Yet the gold standard was definitely not a perfect substitute for gold clauses, since the club of countries that could issue abroad debts denominated in their own currency was much more selective than the gold club (as illustrated later, in table 9.5, which shows the list of "senior" sovereigns in London.[26] These data come from Burdett's Official Stock Exchange Intelligence.) Table 9.3 lists the bonds with various characteristics, including the currency in which it was issued and the currency in which the coupon was payable for ten major countries, eight of which issued bonds in their own currencies without fixed exchange rate clauses.[27] Other countries listed only showed bonds issued in some gold-tied unit.[28]

The borderline members of the list (i.e., those for which the currency denomination was ambiguous) provide interesting evidence that the mere stabilization of the currency in terms of gold was not enough. As can be seen, Austria-Hungary's position is ambiguous. And as a matter of fact, we found in separate French sources an interpretation of this problem: In the early 1890s, this country sought to stabilize its currency and defined a new unit, the crown, with a fixed gold parity. At first, market participants understood

25. The fixed exchange rate clause could come in various ways: either by denominating the currency in the foreign currency, by denominating it in a gold or silver domestic unit that thus had a fixed exchange rate with foreign gold or silver units, or by stating the fixed exchange rate at which the coupon would be paid to foreigners regardless of the actual exchange rate against paper money. From an economic point of view all these are equivalent.

26. The countries that could issue sovereign bonds in terms of their own currencies during the period 1880–1914 were the United States, the United Kingdom, France, Germany, the Netherlands, Belgium, Denmark, and Switzerland. Two additional countries included in the table that listed sovereign debt in their own currency were Austria, Hungary and Italy. However, there is ample evidence to suggest that these bonds bore gold clauses. See Tattara (1999) and Flandreau (2002).

27. For the United States, table 9.3 shows three bonds listed as payable in gold coin for the years 1895, 1898, and 1900. The previous bonds shown are listed as "payable in the coin standard of the United States." The changed status was a response to the silver uncertainty of the 1890s, to remove any ambiguity over which metallic coin was the standard. See Wilkins (1989) and Laughlin (1903).

28. These data are available on request.

Table 9.3 **International Sovereign Securities Listed on the London Stock Exchange, 1880–1913, Selected Countries**

	Name of Agents or Bankers	Year of Issue	Price of Issue (%)	Income (%)	IPO Yield	Year of Redemption	Currency	Total Amount	Interest	
									City/ Country	Currency Payable
France										
3% rentes		1886–91					Francs	15,304,231,433	Paris	No fixed exchange
							or pounds	612,169,256		
4% rentes							Francs	11,152,400		
4.5% rentes, old							Francs	831,855,666		
4.5% rentes of 1883		1883					Francs	6,789,783,906		
							or pounds	271,466,397		
3% redeemable rentes		1878				1953	Francs	4,004,346,100	Paris	
		1881					or pounds	160,173,844		
		1884								
Germany										
3.5% consols							Marks	450,000,000	Germany	
3% imperial loan	Berlin, London	1890	87	3	3.45		Marks	170,000,000	Germany, London	Marks; pounds: exchange of the day
		1891	84.4	3	3.55		Marks	200,000,000		
		1892	83.6	3	3.59		Marks	160,000,000		
		1893	86.8	3	3.46		Marks	160,000,000		
		1905	101.2	3.5	3.46		Marks	300,000,000		
3.5% bonds										
		1906	100.1	3.5	3.50		Marks	260,000,000		
		1909	95.6	3.5	3.66		Marks	160,000,000		
4% bonds		1909		4						
Bavaria							Marks	940,000,000	Berlin, Frankfurt	
Prussia										
Prussian consols (now 3.5%)							Marks	3,592,667,850	Berlin, chief Prussian towns	
4% consols							Pounds	84,500,000	Berlin, chief Prussian towns	
3% consolidated state loan		1890–1905					Marks	1,501,296,150	London, Germany	
4% bonds		1909		4			Marks	1,260,000,000		
3.5% bonds		1906	100.1	3.5	3.50		Marks	6,090,675,900		

The Netherlands										
2.5%		1814					Florins	626,008,900	Holland	Florins
3.5% of 1830		1830					Florins	3,356,000	Holland	Florins
4%							Florins	182,075,900	Holland	Florins; twelve guilders to the pound
3%	Barings	1844,1896,1898					Florins	468,175,300	Holland	Florins
State railway stock		1870					Florins	2,719,693		
State railway stock		1876					Florins	294,000		
3.5%		1886					Florins	11,250,000	Amsterdam, London, Paris Frankfurt, Berlin	
4%		1878	98.375	4	4.07	1936	Florins	43,000,000	Holland	Florins
							Pounds	3,583,333		
4% of 1883		1883	98.75	4	4.05	1939	Florins	609,000,000	Amsterdam	Florins
							Pounds	5,075,000		
3.5% of 1891		1892	100.5	3.5	3.48		Florins	44,700,000	Amsterdam	
3.5% loan, 1911		1911		3.5					Amsterdam; London, Paris, Berlin Hamburg, Frankfurt	Florins; at the exchange of the day
United States										
4.5% funded		1876				1891	Dollars	300,000,000	America	
4% funded		1877				1907	Dollars	1,000,000,000	America	
3%		1882					Dollars	274,937,250	America	
4.5% loan of 1891							Dollars	25,364,500		Gold coin
4% loan		1895				1925	Dollars	162,315,400	United States	Gold coin
3% loan		1898				1908	Dollars	198,792,660		
2% thirty-year bonds		1900				1930	Dollars	646,250,150	United States	Gold coin
Belgium										
2.5%	Rothschilds	1842					Francs	389,271,000	Belgium Paris	
4%							Francs	731,287,900		
							Francs	134,719,000		
4% loan of 1883		1883	104.28	4	3.84		Francs	164,796,000	Belgium, Paris	
3.5% debt		1886					Francs	1,296,935,757	Belgium, Paris	

(*continued*)

Table 9.3 (continued)

	Name of Agents or Bankers	Year of Issue	Price of Issue (%)	Income (%)	IPO Yield	Year of Redemption	Currency	Total Amount	Interest	
									City/ Country	Currency Payable
3% bonds (first series)		1895					Francs	544,956,275		
		1897					Francs	208,046,500		
		1898					Francs	195,993,800		
3% bonds (second series)	Barings	1873–1912					Francs	1,912,520,800	Belgium, Paris, London	Francs pound: 25 francs 25 cents (fixed)
	Cashier of state Rothschilds	1895					Francs	960,489,882		
3% bonds (third series)	Cashier of state	1895					Francs	200,040,000	Belgium	Francs; pound: 25 francs 25 cents (fixed)
	Rothschilds				3		Francs	59,856,600	Paris	
3% conversion loan		1895					Francs	1,301,446,057	Belgium, Paris	
Denmark										
4% 1850	Hambros	1850–61	90	4	4.44		Pounds	400,000		
4% 1862	Hambros	1862	91	4	4.40		Pounds	660,000		
4% state loan	Hambros	1880					Kronen	26,339,700	London	
							Pound	93,525		
3.5% internal debt loan	Hambros	1887	98.5	3.5	3.55		Kronen	155,000,000	Copenhagen, London	Current exchange rate
3.5% amortisable loan	Crédit Lyonnais	1900	94.75	3.5	3.69				Copenhagen, London, Paris, Berlin Hamburg, Brussels	
3% gold loan of 1894	Hambros	1894	96.375	3	3.11	1914	Kronen	66,306,000	London, Paris	Exchange of the day; 10.50 francs per 500 kronen
							or pounds	3,684,777	Copenhagen,	
3% gold loan of 1897	Hambros	1897	99.125	3	3.03				London, Paris	

4% loan of 1912	Hambros	1912	97	4	4.12		Pounds	2,500,000	London, Paris, Copenhagen Hamburg, Amsterdam	Sterling; 25.20 francs; 1816 kronen 20.43 reichsmarks, 12.10 florins
Switzerland										
3.5% loan		1903–07					Francs	500,000,000	Switzerland London	
Austria										
Austrian 5% silver rentes		1868–					Florins	1,005,757,895	Vienna	Silver
Austrian 5% paper rentes		1868–					Florins	1,483,387,487	Vienna	Paper
Austrian 4% gold rentes		1876–					Florins	490,850,200	Vienna; Berlin, Stuttgart, Frankfort Brussels, Amsterdam, Paris	Gold; marks, 20.25 marks per 10 florins Francs, 25 francs per 10 florins
Paper rentes		1881					Florins	238,877,100		Paper
Austrian 4% converted rentes		1903					Kronen	3,614,486,820	Vienna Brussels, Amsterdam, Paris, Bale, Zurig	 25 francs per 10 florins
Austrian 4% kronen rentes		1901–12					Kronen	2,265,844,500	Vienna, Amsterdam, Germany	
Austrian 3.5% rentes		1897					Kronen or florins	116,901,000 58,450,500		
Hungary										
Hungarian loan	London & County	1868	71.66	5	6.98	1917	Pounds	8,512,560	Paris, Frankfort-on-the-Main, Amsterdam Vienna, Budapest	
5% 1871	Raphaels	1872	81	5	6.17	1904	Pounds	300,000		
5% of 1873	Raphaels	1873	80	5	6.25	1904	Pounds	5,400,000	Paris, Frankfort-on-the-Main, Amsterdam Vienna, Budapest	
4% gold rentes	Rothschilds	1881–88	75.5	4	5.30		Pounds	62,200,000	London, Paris, Frankfurt, Amsterdam Vienna, Budapest	

(*continued*)

Table 9.3 (continued)

	Name of Agents or Bankers	Year of Issue	Price of Issue (%)	Income (%)	IPO Yield	Year of Redemption	Currency	Total Amount	Interest	
									City/ Country	Currency Payable
4.5% state railways bonds		1889					Florins (gold)	52,000,000	Budapest, Vienna, Berlin, Frankfurt, Paris	
3% state gold loan	Lloyds	1895	87	3	3.45		Pounds	1,875,000	London, Budapest, Vienna, Berlin Frankfurt, Amsterdam	
4% rentes		1892					Kronen	1,062,000,000	Budapest, Vienna, Berlin, Frankfurt, Amsterdam	
		1900					Kronen	120,000,000	Hamburg	
		1902					Kronen	1,087,470,000		
4.5% treasury bonds		1910	99.4	4.5	4.53	1913–14	Crowns	250,000,000	Budapest, Vienna	
Italy										
Sardinian 5%	Hambros	1851	85	5	5.88		Pounds	3,600,000	London	
5% rentes	Rothschilds Barings Hambros	1861–		5			Lire	8,025,000,000	Italian treasuries, Rome; Paris, London	
Maremmana railway loan	Hambros	1862	74	5	6.76	1960	Pounds	1,782,000	Italian treasuries, London	
3% rentes	Rothschilds	1863					Lire	160,600,000		
Irrigation canal company	Hambros	1863 onward		6		1915	Pounds	2,700,000	London, Paris, Italy	
4% rentes		1895							Paris, Berlin, Vienna, London	
3% railway bonds	Barings Hambros	1887–96		3		1986	Pounds	48,914,000		
3.5% (net) rentes	Rothschilds	1902	96	3.5	3.65		Lire	33,013,293		
Credit communal and provincial bonds	Hambros	1904		3.75		1964	Lire	152,582,000		Lire (home); gold (abroad)
3.5% rentes	Rothschilds	1911		3.5			Lire	283,448,336	Also in Paris, Berlin, Vienna, London	Fixed by government

Source: The *Official Stock Exchange Intelligence* (1880–1913).

that since the crown "only exists as gold unit, and there are no paper crowns" a crown-denominated debt had to be understood as a gold debt with an exchange rate "worth 1.05 French francs."[29] However, once the Austro-Hungarian currency was stabilized and the crown became in 1900 the actual unit of account, it was realized that Austria's and Hungary's crowns debts were "without fixed parities in terms of foreign currencies, [because] Austria's monetary regime is a paper regime. In the event of a crisis, the value of the Austrian crown might experience depreciation."[30] This shows that having a gold parity that was credible over the short run was not a perfect substitute for a very long-term commitment to exchange rate stability.

Having a large gold debt and experiencing an exchange rate crisis could have devastating consequences. When a country embarked on a spending spree and public debt increased, the share of gold-denominated debt increased in its turn. This created an explosive mismatch. The crises of the early 1890s—very much like those of the 1990s—provided evidence of the mechanism at work. Argentina opened the dance: There, the expansion of the gold debt (*cedulas*), accompanied by paper money issue, pushed the level of the debt burden to unsustainable heights.[31] The interruption of capital exports that resulted increased the needs of a number of financially weak peripheral countries whose currencies depreciated in turn. As argued in Flandreau (2002), the public debt crises in Portugal and Greece (in 1892 and 1893 respectively) both resulted from the depreciation of the exchange rate that had brought these countries' public debts to unsustainable levels.

The responses to these problems induced by high debts and financial vulnerability were also surprisingly modern. Some countries, such as Spain or Portugal, continued to float but minimized their exposure by limiting their borrowings abroad. Some others, such as Russia or Greece, developed de facto currency boards. They accumulated gold reserves beyond what was statutorily necessary and in effect adopted stabilization cover ratios that were consistently above 100 percent. Yesterday, like today, the response to financial vulnerability has been either a float with reduced exposure to the foreign capital market, or super-strong pegs. Hollowing out is a very old thing.

This discussion should shed a new light on the abundant quotes that one finds in the old literature regarding the importance of the gold standard as a way to foster integration and which have so often been analyzed in the recent literature as evidence of the ideology or "spirit" of the time.[32] There might in fact have been a lot more economic motivations behind these recommendations than is commonly acknowledged. Clearly, in view of the

29. Crédit Lyonnais Archives, date 1893.

30. Crédit Lyonnais Archives. The date of this statement, certainly not incidentally, is 1 May 1914.

31. See, for example, Eichengreen (1997).

32. See, for example, Gallarotti (1995) and Eichengreen and Temin (1997).

narrow list of countries that were able to float debts in their own currency, much of the emerging world was bound to face problematic currency mismatches.[33]

From this point of view, gold adherence became for those willing to protect themselves against international financial disturbances a second-best solution. It is not that a gold standard immediately bought credibility. Rather, it served as an insurance mechanism and in this sense fostered globalization. In other words, the spread of the gold standard in the periphery was an endogenous response to the gold clauses: As soon as the price of this insurance decreased (as was the case during the gold inflation of 1896–1914), the gold standard expanded, as more and more countries found it less dangerous to borrow with gold clauses since the risk of being tipped off gold declined.[34]

9.3.4 Exchange Rate Regimes and the Financial Maturity Hypothesis

A consequence of the analysis developed here is that logically, pre-1914 core countries that had developed strong money and financial markets before WWI and were thus able to issue foreign debts in their own currency ought to have floated—which they did not. At first sight, this seems to be a serious challenge to our view and may require a word of explanation. However, the evidence reported above, that core countries pioneered the use of exchange rate adjustments within the gold points in a target zone fashion, suggests that core countries were nonetheless exploiting to the fullest possible extent whatever flexibility they had. In a sense, the seeds of a floating exchange rate system were sown at the center.

The question still arises: Why did advanced countries before 1914 that were financially mature not float as advanced countries do today? Possible answers include the protection that gold gave to bond holders against inflation risk and the path dependency of gold as money.

Indeed, historians have emphasized that the rise of a large and liquid market for government debt in the eighteenth and nineteenth century has been the hallmark of financial development. But this meant that at the beginning of the process, domestic residents saving for their retirement had their money mostly in the fixed income portion of the market and would

33. This was likely to become a serious problem for governments in the periphery, given the role government undertakings had in the process of catching up in the late nineteenth century (Gerschenkron 1962).

34. This explanation is not a mutually exclusive one. An alternative reason why periphery countries may have favored gold standard adherence is that the gold standard served as a "Good Housekeeping Seal of Approval"—a signal to lenders in the core that peripheral countries followed sound financial policies. See Bordo and Rockoff (1996) for evidence that sovereign debt spreads on London were lower for emerging countries that adhered strongly to gold relative to those whose adherence was less conscientious and those on paper standards. Also see Obstfeld and Taylor (ch. 3 in this volume). Flandreau, Le Cacheux, and Zumer (1998) stress the role of gold inflation after 1896 as reducing the burdens of public debt for European peripheral countries and hence making their adherence to the gold standard more sustainable.

take a beating if governments inflated away.[35] Thus the response, as in the well-known British case, was to develop powerful parliaments that took the power over money out of the hands of sovereigns and linked the domestic unit to a weight of gold. But once this was done, this created strong constituencies that resisted the devaluation of the unit in terms of gold.

This domestic mechanism was supplemented by an international one, since in practice no single country could easily take the lead and move away from the system and widen the fluctuation bands, without raising the suspicion that it truly wanted to depreciate. In the end, core countries were locked onto gold, and peripheral countries had either to float or to lock onto core countries. To give way, the gold standard needed some easily identifiable external shock such as WWI. It took another six decades for a universal floating exchange rate system based on a credible domestic nominal anchor to be established (although earlier successful efforts prevailed in the United Kingdom and Sweden in the 1930s and in Canada in the 1950s).[36]

The history of the international monetary system for the advanced countries in the twentieth century has been well documented (Bordo and Schwartz 1999; Redish 1996; Eichengreen 1996). The path dependency of gold seen in adherence to some form of gold convertibility prevailed until 1971. The golden nominal anchor was stretched with the use of international reserves in the interwar exchange standard and even more under the Bretton Woods system, while monetary policies became increasingly geared toward domestic goals.[37] Ultimately the gold-based system became unworkable, and it collapsed in 1971. The full shift to a credible domestic nominal anchor and floating exchange rates in the 1970s and 1980s required the development of deep and mature financial markets discussed here and in Rousseau and Sylla (ch. 8 in this volume) as well as the adoption of monetary rules that in many ways echoed the functions of the gold standard convertibility rule.

Thus today by contrast, the more financially developed part of the world has finally been able to exploit to its fullest possible extent its ability to float. As a matter of fact, the generalization today of floating in the developed countries virtually encompasses the list of countries that can issue international securities in their own currency, as we will discuss in section 9.4.

35. In today's world, where price indexes are systematically constructed by generally careful institutions and are thus fairly consensual, the issue of determining the reasons why governments scarcely issue indexed bonds might be addressed (see, however, the mid-1990s controversies on the inflation measurement problem in the presence of rapid technological progress). But at the time the distrust of index numbers was not even a question.

36. The case for generalized floating was made clearly by Gottfried Haberler in the 1930s but was rejected by the consensus view of the time that floating was destabilizing, see Bordo and James (2001).

37. According to Bordo and Eichengreen (1998), had the Great Depression not intervened, the gold exchange standard would have prevailed until the late 1950s.

9.4 Financial Depth and the Exchange Rate Regime

The interpretation of the seemingly opposite nature of global exchange rate regimes in the two big eras of globalization (fixed exchange rates back then, floating ones today) has put at the center of the picture the role of financial vulnerability and financial crises. To some extent, the Baring crisis yesterday played a role similar to the crises of the late 1990s in reminding floaters about the dangers of an impervious flexible exchange rate. As a result, whereas developed countries have always had the temptation and ability to float (with floating restricted yesterday by path dependency and the difficulty of creating domestic institutions that could create a domestic nominal anchor), the periphery has always faced serious difficulties in floating, viewing the gold standard yesterday, and hard pegs today, as a second-best solution.

The change in the dominant form of regime has implications as to where we should find greater financial depth: In the pre-1914 era, when the gold standard was the dominant monetary arrangement, we would expect countries adhering to *gold* to have greater financial depth than those that did not. In the post-1973 period, in which floating is the dominant regime, we would expect by contrast that countries that can *successfully* operate *pure floats* would also be more financially developed than those that could not. However, those emerging countries that could not, or for other reasons—such as considerable openness or close trading linkages to a large country—choose not to float and instead adhered to hard pegs (e.g., Hong Kong and Singapore), would also have greater financial depth than countries following intermediate regimes.

In this section we seek to investigate this prediction by looking at the record of both the periods 1880–1914 and 1973–97 and attempting to identify the effects of alternative exchange rate regimes on financial depth, which we proxy before 1914 by the ratio of a broad monetary aggregate (M2) to gross domestic product (GDP) and after 1973 by similar variables plus other broader measures, to be discussed below. These variables can in turn be viewed as indicators of a set of factors that come under the rubric of financial maturity.[38]

9.4.1 The Classical Gold Standard, 1880–1913

Because of its biblical simplicity, the 1880–1913 period is an ideal testing ground for our hypothesis that the dominant exchange rate regime, by

38. Rousseau and Sylla (ch. 8 in this volume) list five attributes of a good financial system, which overlap our meaning of financial maturity: sound public finance and debt management; stable money; a sound banking system; a central bank to act as a lender of last resort and to manage international financial arrangements; and a well-functioning securities market. They employ the same measure of financial depth we do both as a determinant of economic growth and as a determinant of international financial integration.

which we mean the more technically advanced, is associated with greater financial sophistication. Case studies of financial development in the nineteenth century have emphasized that those countries which adhered to gold in the 1880s, 1890s, and 1900s, such as France, Great Britain, and Germany, were also the more financially developed. This cross-section evidence is supplemented by time series analysis such as in Gregory (1995) and Komlos (1987), according to whom the Russian and Austro-Hungarian stabilizations in the 1890s were both associated with a considerable expansion of the monetary base. In line with these earlier studies, we believe that the expansion of real broad money would be a good proxy for financial depth before 1914 because this was an era in which monetization (the spread of the money economy) proliferated across the world, as did the growth of banking systems (Bordo and Jonung 1987).

To test systematically for the link between the exchange rate regime and financial development, we assembled a panel of data for twenty-three countries for 1880–1913.[39] The panel includes both advanced (core) and less developed (periphery) countries.[40] The strategy followed is to run panel regressions of the log of M/Y (money to income ratio) on a number of controls to see whether a dummy capturing the years in which a country adhered to gold or did not, and another one capturing whether a country had international sovereign bonds listed in terms of its own currency on the London Stock Exchange in 1913, had positive and significant effects.[41] Other things being equal, we would expect that our measures of financial depth would be higher under the gold standard than under paper money, and for a country that can issue foreign bonds denominated in its own currency than for another that cannot.

To test this, it is necessary to control for other effects. The first is per capita real income. From the literature on money demand, other things being equal, we would expect the elasticity of M/Y with respect to real per capita income to be zero (Friedman 1959).[42] However, in the situation where money balances are a luxury good and the income elasticity of money de-

39. The data sources are listed in the appendix.

40. The advanced countries, demarcated both by income and by the fact that they were capital exporters (with the principal exception of the United States before 1900) were Belgium, France, Germany, the Netherlands, the United Kingdom, the United States, and Switzerland. The emergers were Argentina, Australia, Austria-Hungary, Brazil, Canada, Denmark, Chile, Finland, Greece, Italy, Japan, Norway, Portugal, Russia, Spain, and Sweden.

41. Gold standard adherence dates come from Bordo and Schwartz (1996) and Eichengreen and Flandreau (1996). We did not distinguish between countries that left and returned to gold at the same parities and those that altered their parities. The domestic currency bond dummy is derived from information in table 9.5. We also ran the regressions using the log of real per capita money balances as our measure of financial depth. This, of course, is the traditional measure of demand for money. The results are very similar to the ones we report below.

42. Real per capita income was expressed in 1913 U.S. dollars. The purchasing power parity–adjusted data are from Maddison (1995). We also tried the unadjusted data in the regressions below.

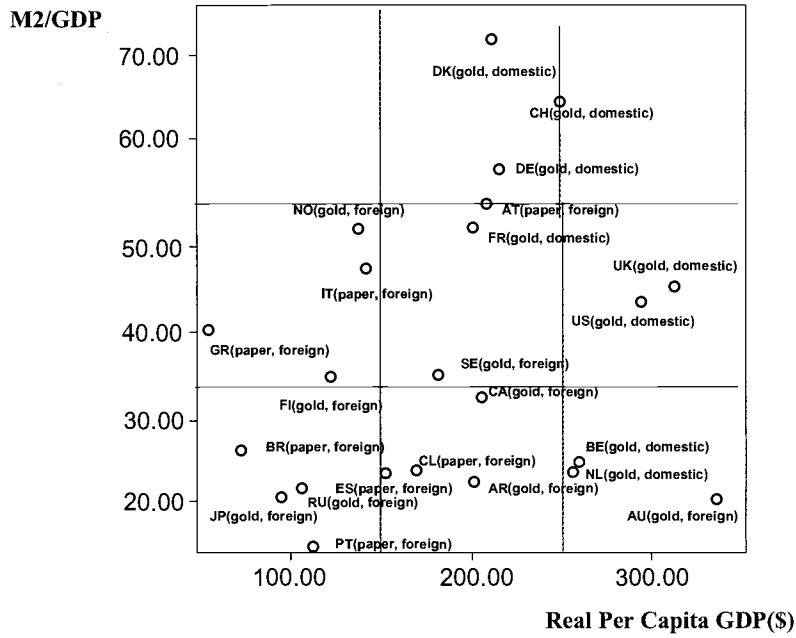

Fig. 9.6 M2-GDP and real per capita GDP (exchange rate regime, debt currency denomination), 1880–1913

mand is greater than one, as evidenced in Friedman and Bordo and Jonung (1987) for a number of our countries for the pre-1914 period, then real income per capita would be positively associated with our measure of financial depth. Thus, we would expect countries with high per capita income before 1914 to have greater financial depth. Such countries would also more likely be on the gold standard and would be able to issue bonds in terms of their own currencies.

Figure 9.6 presents a scatter plot of M/Y and real per capita income showing this relationship nicely.[43] In the left-hand corner we see mainly paper currency countries with low financial depth that borrowed abroad in sterling or had gold clauses. In the upper right-hand corner we observe high-income countries with high M/Y who were on gold and could issue bonds in their own currency, with the anomalies being easily explained.[44] Similar figures for 1880–96 and 1897–1914 (not shown) nicely trace out the

43. A similar pattern is observed comparing real per capita cash balances and real per capita income.

44. Belgium and the Netherlands, with high per capita income but low financial depth. This reflects the fact that broad money data are unavailable for these countries before 1913 and we had to use M1.

Table 9.4 **Panel Estimates: Regressions with Fixed Effects 1880–1913, Twenty-Three Countries**

	Dependent Variable log M2-GDP			
Independent Variable	(1)	(2)	(3)	(4)
Gold standard	**0.082**		**0.102**	**0.099**
	[20.8]		[26.6]	[25.5]
	(5.134)		(5.686)	(5.409)
Domestic currency bonds		**0.102**		**0.083**
		[26.4]		[21.1]
		(4.632)		(3.833)
Real per capita GDP (log)			**0.266**	**0.263**
			(4.753)	(4.684)
Short-term interest rate (log)			**–0.089**	**–0.089**
			(–3.780)	(–3.887)
N	782	782	782	782

Notes: Generalized least squares (GLS) with cross-section weights; country dummies, and a time trend (not shown in the table); *t*-values in parentheses; response percent in brackets.

transition from paper to gold by a large number of emerging countries as their incomes and financial development progressed.[45]

As controls in the regression we used the traditional determinants of the demand for money: real per capita income (discussed above) and a short-term interest rate. We would expect the short-term interest rate, representing the opportunity cost of holding money balances, as well as the presence and spread of financial assets as substitutes for money, to be negative.[46] Other controls tried in the regressions (but not presented in the results below) were the (log of the) consumer price index (CPI) inflation rate, to measure the opportunity cost of holding money relative to goods, and the fiscal balance, because a tendency to run a deficit might signal eventual attempts to predate the financial sector, thus causing, in line with our earlier discussion, a persistence of domestic financial underdevelopment as people continue to hold their balances abroad.

Table 9.4 shows log linear panel regressions for twenty-three countries for M2-GDP including country (fixed effects) and a time trend. In column (1) the gold adherence dummy is significantly associated with a higher ratio of M2 to GDP. Going from paper to gold is associated with a 21 percent higher M2-GDP ratio (the response indicated in brackets).[47] Countries that

45. See Eichengreen and Flandreau (1996) for other factors explaining the transition.

46. For the short-term interest rate in most countries we used the official discount rate. For the core countries (United States, United Kingdom, France, Germany, and the Netherlands) we used open market rates. For several countries where data on short-term interest rates are unavailable we used long-term interest rates.

47. Calculated as in Halvorsen and Palmquist (1980).

could issue sovereign debt in terms of their own currencies also had higher ratios of M2-GDP by 26 percent (column [2]). The addition of real per capita income and short-term interest rates to the regression with the gold dummy (column [3]) shows significant coefficients for all regressors with signs suggested by theory, the positive and greater than one coefficient on real per capita income agrees with earlier evidence in Bordo and Jonung (1987). Finally, and quite importantly, the addition of the Bond dummy is also significant (column [4]).

In sum, these results suggest that countries that could adhere to gold were financially more developed. Also financially developed countries were those that could issue sovereign debt in terms of their own currency.[48]

9.4.2 1973–97

In this section, we conduct similar exercises for the current regime of open capital markets and generalized floating. Our assumption is that today, as in the previous era of globalized financial markets, we would expect that advanced countries would have greater financial depth than emerging ones and (ceteris paribus) would float. Moreover, as emerging countries moved toward advanced country status they would adopt the monetary regime of the advanced countries. Thus we would expect to find that, across both advanced and emerging countries, financial depth would be positively associated with adherence to freely floating regimes relative to adherence to other regimes.

A number of reasons, however, suggest that the clean results we reported in the previous section might not be so easy to replicate in today's world. And since these affect the regression strategy, it seems necessary to spend a while discussing them. One reason is that the expansion of the real broad money supply might not be as good a measure for today as it was for the late nineteenth century, especially for the advanced countries because of the development of other financial assets as substitutes for money bal-

48. As a sensitivity test, we ran a panel probit regression taking the choice of exchange rate (adherence to gold or not) as the dependent variable and M2-GDP and the other controls from table 9.4 as the independent variables. In the regressions the M2-GDP ratio was positive and significant but the bond dummy was insignificant. The coefficient on M2-GDP suggests that a 1 percent increase in financial depth would increase the probability of a country adhering to gold by 6.5 percent. This result, compared to the coefficient of the exchange rate variable shown in the regression in table 9.4, raises the tricky issue of causality between financial depth and the exchange rate regime.

On the one hand, Rousseau and Sylla's (ch. 8 in this volume) evidence that financial development is a key determinant of the earlier growth of today's advanced countries and Eichengreen and Flandreau's (1996) findings that growth is a determinant of pre-1914 gold standard adherence suggest that financial development may explain the ability to adhere to gold. On the other hand, adherence to the specie standard in Europe long predated modern growth, and England's switch to gold de facto in 1717 also preceded both modern economic growth and much of England's financial development. Thus arguments for causality between the exchange rate regime and financial depth can go both ways.

ances, as well as technological innovation, which economizes on cash balances.[49]

A second reason is that the simple menu of alternatives to floating that prevailed in the late nineteenth century (peg to gold) has been replaced by a more complex one: peg to the dollar, peg to the mark, peg to the euro, peg to a basket, not to mention various intermediate arrangements ranging from dirty floats and adjustable pegs to crawling pegs. These latter arrangements purport to maintain some of the advantages of floating—monetary independence and insulation from external shocks—with the advantages of pegging.

A third reason is that, as a number of recent papers have argued, the IMF classification of exchange rate regimes, which is based on information provided by the member countries, may not reflect the true underlying regime. Thus, Calvo and Reinhart (2000a,b) present evidence to the effect that countries that say they are floating show little variation in their exchange rates but substantial variation in their international reserves and interest rates and hence act more like peggers.

What we argue here is that the dose of "nineteenth-centurism," which according to us has survived in the periphery, implies that for those emerging countries that are unable to successfully float because a substantial portion of their outstanding financial obligations are denominated in dollars or other advanced countries currencies, pegging would mean financial deepening—in a nineteenth-century fashion. This follows because the alternative of volatile exchange rates could have serious consequences for the private sector's balance sheet and hence for the real economy—manifest by their inability to sell their debt denominated in their own currency in international markets. These countries would be better off, it is argued, if they dollarized.

For these emerging markets, especially those of Latin America, Hausmann, Panizza, and Stein (2000) argue that greater financial depth would be associated with fixed exchange rate arrangements (i.e., to peg as second best).[50] Thus we may expect to see a bipolar pattern wherein advanced countries and some emergers that can emulate them have greater financial depth associated with floating, and others who cannot float—or because of their greater openness choose not to—have greater depth associated with fixing.

In our empirical work, we use a panel of forty-four countries with data from Bordo et al. (2001): twenty-two advanced countries and twenty-two emerging countries.[51] Exchange rate regimes are identified with dummies

49. Thus, velocity (the inverse of M2-GDP) displays a U-shaped pattern over the past century and across countries by levels of development (Bordo and Jonung 1987).

50. Also see Eichengreen and Hausmann (1999).

51. The twenty-two advanced countries are Australia, Austria-Hungary, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, the Netherlands,

constructed using the two exchange rate definitions discussed in section 9.2 (Masson 2001 and Levy-Yeyati and Sturzenegger 2001). To measure financial depth, as we did for the 1880–1913 period, we used the M2-GDP ratio. However, as argued above, we might expect that this measure may not be as good a proxy for financial depth today as it was a century ago. As alternative measures of financial depth we use three measures developed for the World Bank by Beck, Demirguc-Kunt, and Levine (1999): FD1, defined as the ratio of private credit to GDP; FD2, defined as private credit plus stock market valuation to GDP; and FD3, defined as FD2 plus private and public bond market capitalization as a share of GDP.[52]

To account for the domestic currency denomination of international bonds we used two databases. The first is the Bank for International Settlements (BIS) data used by Hausmann, Pannizza, and Stein (2000), which contain all international securities and bank loans by currency and issuer, but only for the period 1993–97. Countries that issued international securities in terms of their own currency consisted of most of the Organization for Economic Cooperation and Development (OECD) countries and in our sample only four emergers: Hong Kong, Singapore, South Africa, and Taiwan. The second measure is all international bonds from data supplied by the IMF. These data cover the period 1980–97 and again consist mostly of OECD countries, plus seven emergers: Argentina, China, Hong Kong, Singapore, Korea, the Philippines, and South Africa. We defined a dummy as equal to one if a country could issue such securities.[53]

Finally, as in the 1880–1913 period, we used as controls in the regression: per capita real GDP in U.S. dollars, short-term interest rates (open market rates where available, otherwise deposit rates), the ratio of fiscal deficit to GDP, and the log of the CPI inflation rate. All these data come from IFS.

9.4.3 Results: All Advanced and Emerging Countries

We present tables similar to those for the pre-1914 period. Table 9.5 shows the coefficients of regressions of the log of M2-GDP on the Masson and LYS floating exchange rate dummies, a dummy for the IMF indicator of the issue of international bonds in domestic currency, and, as a control, the short-term interest rate.[54]

New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. The twenty-two emerging countries are Argentina, Brazil, Chile, China, Colombia, Ecuador, Hong Kong, Indonesia, Israel, Korea, Malaysia, Mexico, Paraguay, Peru, the Philippines, Singapore, South Africa, Taiwan, Thailand, Turkey, Uruguay, and Venezuela.

52. See Khan and Senhadji (2000) for an earlier use of these measures to explain the pattern of growth across emerging countries.

53. The dummy starts the year that the listings begin.

54. We also used the Bank for International Settlements (BIS) measure of bonds issued in domestic currency. The results were usually similar, so because the data for these bonds only cover five years we do not report them unless otherwise indicated. As an alternative to the log of short-term interest rates we use the log of the inflation rate. The results using this variable were almost identical to those using the log of interest rates, so we do not report them here. We

Table 9.5 Panel Estimates: Regressions with Fixed Effects 1973–97, All Countries

	Dependent Variable log M2-GDP					
	All Countries		Advanced Countries		Emerging Countries	
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Masson float	**0.094**		**0.108**		**0.070**	
	[24.1]		[28.1]		[17.5]	
	(3.614)		(3.433)		(1.677)	
Levy-Yeyati-Sturzenegger float		**0.020**		**0.031**		**0.021**
		[4.8]		[7.4]		[5.1]
		(2.010)		(1.987)		(1.592)
Domestic currency boards	**0.081**	**0.087**	**–0.024**	**0.059**	**0.184**	**0.456**
	[20.5]	[22.3]	[–5.4]	[14.7]	[52.6]	[186]
	(6.424)	(5.101)	(–1.539)	(3.167)	(5.251)	(4.199)
Short-term interest rate (log)	**–0.067**	**–0.074**	**–0.060**	**–0.049**	**–0.064**	**–0.093**
	(–6.933)	(–7.048)	(–5.153)	(–3.433)	(–4.294)	(–5.952)
N	1,025	1,008	500	504	525	504

Notes: GLS with cross-section weights; country dummies, and a time trend (not shown in the table); *t*-values in parentheses; response percent in brackets. For columns (2), (4), and (6) we used the BIS bond dummy.

As in the 1880–1913 regressions we include country fixed effects and a time trend. We exclude real per capita income from the regressions shown because the estimated income elasticity was close to zero (the income elasticity with respect to real cash balances close to one). Indeed, the specification of the M2-GDP ratio we present is similar to the one first used by Latane (1954) and by Lucas (1988).

In table 9.5 we present the results for all countries and then separately for advanced and emerging countries. As can be seen in columns (1) and (2) for all countries, all three independent variables are significant. Financial depth increases on average when countries float—according to the Masson definition, by 24 percent; for the LYS, by 5 percent. When they can issue bonds in terms of their own currencies, financial depth increases by slightly over 20 percent.[55]

For the advanced countries (see columns [3] and [4]), as in the case of all countries, both floating exchange rate indicators are positive and significant, as is the bond variable in column (4).[56] For the emerging countries (see columns [5] and [6]), the Masson dummy is positive and significant at conventional levels, whereas the LYS dummy is barely significant at the 10 per-

also do not report results for regressions including the fiscal deficit–GDP ratio. That ratio was often insignificant.

55. In the regressions in column (2) we used the BIS measure of local currency bonds because the IMF measure was not significant.

56. Again, in column (4) we used the BIS bond dummy.

Table 9.6 **Panel Estimates: Regressions with Fixed Effects 1973–97**

	Dependent Variable log M2-GDP					
	All Countries		Advanced Countries		Emerging Countries	
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Masson fixed	**–0.110** [–22.4] (–3.959)		**–0.079** [–16.7] (–2.723)		**–0.268** [–46.1] (–2.802)	
Levy-Yeyati-Sturzenegger fixed		**–0.039** [–8.6] (–1.943)		**–0.026** [–5.8] (–1.183)		**–0.018** [–4.0] (–0.601)
Domestic currency rate (log)	**–0.065** (–6.807)	**–0.111** (–11.696)	**–0.060** (–5.007)	**–0.049** (–3.477)	**–0.077** (–5.351)	**–0.081** (–5.326)
N	1,025	504	500	504	525	504

Notes: GLS with cross-section weights: country dummies, and a time trend (not shown in the table); *t*-values in parentheses; response percent i brackets. For column (4) we used the BIS bond dummy.

cent level. Also, the bond variable is significant and positive in both specifications.

We then ran similar regressions to those in the above tables but substituted the Masson and LYS fixed exchange rate dummies for the floats used in table 9.5; see table 9.6. For all countries both fixed exchange rate dummies were significant and negative in a regression including the bond dummy and the interest rate.

The same result obtained for the advanced countries using the Masson dummy, with the LYS exchange rate indicator insignificant. Finally, for the emerging countries, the Masson fixed exchange rate dummy was negative and significant in all the regressions, whereas the LYS dummy was always insignificant.[57]

In sum, the results from tables 9.5 and 9.6 for the 1973–97 period when floating was the dominant exchange rate regime seem to be consistent with those of the pre-1914 era in table 9.4, when gold was the dominant regime. For advanced countries and, to a lesser extent, emerging countries, greater financial depth both as measured by M2-GDP and the ability to issue international bonds in domestic currency is associated with floating.

57. As for the pre-1914 sample, we also reran the regressions above as panel probits with the exchange rate regime dummies as dependent variable. Taking the floating exchange rates as dependent variables we found that M2-GDP was generally positive and significant for all the country classifications using both the Masson and LYS indicators. Similar results obtained for the bond dummies. Taking the fixed exchange rate regime as dependent variable, M2-GDP was generally negative and the bond dummy was insignificant. As was the case for the pre-1914 period gold standard, the question of causality between financial depth and the exchange rate regime is difficult to sort out. A deeper analysis of the circumstances of each country is likely required.

9.4.4 Latin America and Asia

The results from table 9.6 for a sample of emergers across the world suggest that hard fixers on average had lower financial depth than others. These results seem to contradict evidence presented in Hausmann, Panizza, and Stein (2000) for Latin America suggesting that fixers had greater financial depth. However, they may also be explained by the fact that emergers who could float were less financially integrated than the advanced countries, as seen in section 9.2, and by the aggregation of very different categories of emerging countries.

To correct for this, in table 9.7 we split the emerging sample of countries into Latin America and Asia, presenting only the significant results. For Latin America we find that the Masson float dummy is positive and significant when introduced alone (but is insignificant with the addition of the interest rate control), whereas the LYS floating dummy is negative and significant in the regressions with controls. At the same time, the Masson fixed exchange rate dummy is negative and significant. Both bond dummies for Latin America are always insignificant.

The LYS results that Latin American countries that float do not have greater financial depth may be consistent with the evidence from the Feldstein-Horioka regressions in section 9.2 that Latin America is relatively financially open. The LYS results, which are based on the economic characteristics of the regime, rather than on information supplied by the reporting countries that lie behind the Masson dummies, may be more telling.

For Asia, we find both floating indicators to be associated with greater financial depth, as is the domestic currency bond indicator, evidence that some Asian countries may be able to emulate the advanced countries. However, the evidence from section 9.2 that financial integration in Asia is less than in Latin America may also explain why some Asian countries could successfully float. At the same time, the LYS fixed exchange rate dummy is also positive and significant in column (9). This last result seems consistent with the hollowing-out hypothesis.

In sum, for the emergers, the case is mixed. Although there is some evidence for the group as a whole that floating was associated with greater financial depth and the ability to issue bonds denominated in domestic currency, we also find when we disaggregate the emerging countries into Latin America and Asia that, although some Latin American countries may have had deeper financial markets associated with floating, there was quite strong evidence that Asian countries with floating exchange rates had greater financial depth than other countries, and moreover they seem to be more mature than their Latin counterparts in terms of the ability to issue international bonds denominated in their own currency (although, again, they may have been able to achieve this because they were less open than other countries). The evidence at the same time that some Asian countries

Table 9.7 **Panel Estimates: Regressions with Fixed Effects 1973–97**

	Dependent Variable log M2-GDP								
	Latin America				Asia				
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Masson float	**0.129** [34.5] (2.700)					**0.15** [43] (3.009)			
Levy-Yeyati-Sturzenegger float			**–0.09** [–18] (–2.044)				**0.08** [19] (2.700)	**0.05** [11] (1.735)	
Masson fixed		**–0.198** [–37] (–3.811)		**–0.43** [–63] (–2.005)					
Levy-Yeyati Sturzenegger fixed									**0.06** [15] (1.759)
Domestic currency bonds					**0.022** [66] (6.443)			**0.18** [53] (5.140)	**0.11** [29] (3.094)
Short-term interest rate (log)			**–0.06** (–4.975)	**–0.098** (–4.812)				**–0.05** (–1.848)	**–0.02** (–0.792)
N	250	250	240	240	264	300	288	264	264

Notes: GLS with cross-section weights; country dummies, and a time trend (not shown in the table); *t*-values in parentheses; response percent in brackets.

with fixed rates had greater financial depth is consistent with both the hollowing-out and "original sin" hypotheses.

9.4.5 An Alternative Measure of Financial Development

Finally, we experimented with regressions similar to those displayed in the two previous subsections but taking as dependent variable the alternative measures of financial development produced by the World Bank: FD1, private credit to GDP; FD2, private credit plus stock market valuation to GDP; and FD3, FD2 plus bond market capitalization to GDP.

The most significant results were for FD2 and FD3, which were quite similar. We show selected results taking the log of FD3 as dependent variable for advanced and emerging countries, Latin America, and Asia in table 9.8. The results for the advanced countries are almost identical to those in table 9.5. For advanced countries greater financial depth is associated positively and significantly with floating and the ability to issue securities in domestic currency. This evidence may be important, because these measures of financial development, unlike M2-GDP, account for

Table 9.8 Panel Estimates: Regressions with Fixed Effects 1973–97

	Dependent Variable log FD3					
	Advanced Countries		Emerging Countries		Latin America	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Masson float	**0.128** [34.4] (3.697)					
Levy-Yeyati-Sturzenegger float		**0.025** [6.0] (1.634)				
Masson fixed			**0.200** [58.5] (3.41)		**0.546** [251.3] (4.145)	
Levy-Yeyati-Sturzenegger fixed				**0.271** [86.7] (4.725)		**0.344** [120.6] (4.619)
Domestic currency bonds	**0.55** [13.6] (1.915)	**0.063** [15.5] (2.304)				**–0.196** [–36.3] (–3.737)
Short-term interest rate (log)	**0.072** (3.615)	**0.025** (1.748)		**–0.025** (–1.45)		**–0.010** (–2.900)
N	440	440	462	462	210	242

Notes: GLS with cross-section weights; country dummies, and a time trend (not shown in the table); *t*-values in parentheses; response percent in brackets. For column (2) we used the BIS bond dummy.

the substitution away from money once an economy becomes fully monetized.[58]

For the emerging countries the evidence unequivocally suggests that greater financial depth is associated with fixed exchange rates. In addition to the fixed exchange rate results presented here, the various floating exchange rate indicators are negative. Similar evidence obtains for both Latin America and Asia. Also of interest, the bond dummy is insignificant in most of the regressions except for Asia, where it is negative and insignificant.[59] These results seem much more in accord with Hausmann's "original sin" hypothesis.

The question then arises: Which measure of financial depth should we pay more attention to, M2-GDP or FD3? For the advanced countries the broader measure should surely be superior to M2-GDP, but this may not be the case for the emergers because the stock and bond markets in these countries may still be in a nascent state, at least compared to the advanced countries.

9.4.6 Summary

In conclusion, the evidence presented in this section for the two eras of globalization suggests some remarkable similarities. In general, countries with greater financial development followed the dominant regime—gold before 1914, floating after 1973. Also, countries that issued international bonds in terms of their own currencies could successfully follow the dominant regime. The exchange rate experience of the advanced countries exactly fits this pattern.

The case of the emerging countries is, however, less clear. Before 1914 emergers went to great lengths to join the gold standard, and the financial performance of those who could not adhere was clearly worse. Today the incidence of emergers who float and who have greater financial depth is less than the pre-1914 incidence of emergers who adhered to gold. Those who cannot float but need access to international capital according to the "original sin" theory must adhere to hard fixes.

The evidence for the recent period is mixed on who has greater financial depth. According to the M2-GDP results, it is floaters based on the Masson exchange rate indicator, although this is not evident from the LYS results, which may be the more economically meaningful. But the FD3 (and FD2) results see hard fixers (especially those in Asia) as more financially developed. In addition, the evidence for Asia that associates some countries' floating experience with greater financial depth may also be reflecting the

58. This substitution process may also explain the positive coefficient on the short-term interest rate for the advanced countries.

59. Panel probit regression of the exchange rate regime dummies on FD3 revealed a pattern of coefficients similar to that in table 9.10, again raising the issue of causality.

fact that Asia is less financially open than Latin America so that it may be capital controls (hidden or otherwise) that allow these regimes to be viable.

Thus we conclude that our empirical results for the emerging countries today are in general consistent with both the hollowing-out and "original sin" hypotheses. More research is clearly needed.

Finally, an important fact that emerges from the evidence in this section is that the number of countries that could issue bonds in terms of their own currencies has not increased all that much over the past century. Before 1914, it was eight. Today, it is about twenty-five. Virtually all of the expansion is by countries like Canada, Italy, and Sweden who graduated to advanced status after WWI. There are very few emerging countries today in either of the lists of bonds that we had access to, and most of them only entered in late in the past decade. The question as to how countries graduate from junior to senior country status in the bond markets is also a subject for further research.

9.5 Conclusion: Financial Maturity—The Holy Grail

The traditional view is that fixed exchange rate regimes are best for the globalization of financial markets. This view is based on the stellar performance of the classical gold standard. Yet today we are in another era of globalization as pervasive as the earlier one, and now the dominant regime is floating. This paradox suggests at first glance that globalization, rather than being determined by the exchange rate regime, occurs independent of the exchange rate regime. However, as we argue in this paper, although this may be the case for advanced countries, it is not for emergers, whose regime choice is in large measure driven by international financial integration.

In this paper we focus on the different historical regime experiences of the core and the periphery. Before 1914, advanced countries adhered to gold and periphery countries tried to emulate the core, especially when they were concerned with attracting foreign capital. Because of their extensive external debt obligations denominated in core-country currencies, peripheral countries were especially vulnerable to financial crises and debt default. This made devaluations difficult for them, leaving them with the difficult choice of floating but restricting external borrowing or devoting considerable resources to maintaining an extra-hard peg. Today, whereas advanced countries can successfully float, emergers must also borrow abroad in terms of advanced country currencies and are afraid to float for the same reason as their nineteenth-century forebears. To maintain access to foreign capital they may need a hard peg to the core-country currencies.

Thus the key distinction between core and periphery countries, both then and now, that we emphasize in this paper is financial maturity. It is evidenced in the ability to issue international securities denominated in domestic currency, or what Ricardo Hausmann refers to as the absence of

original sin. Indeed, our hypothesis is that countries that are financially developed, in a world of open capital markets, should be able to float as advanced countries do today. Evidence for the core countries that the classical gold standard operated as a target zone with the gold points serving as bands in which credible floating could occur and external shocks could be buffered is a presage of the regime followed today. Today's floating is a product of financial maturity and the development of the technological and institutional structures and constraints that allow policymakers to follow stable money and fiscal policy without adhering to an external nominal anchor.

We present several strands of evidence for our hypothesis that globalization is largely independent of the regime for advanced countries but drives the exchange rate regime for the periphery. First, evidence from Feldstein-Horioka tests over the period since 1880 agrees with the folk wisdom that financial integration was high before 1914, as it is today. But the evidence suggests that it was not the exchange rate regime followed that mattered, but the presence of capital controls. Moreover, a comparison between advanced and emerging countries today suggests that although there is considerable financial integration among the advanced countries, most of whom can float, this is not the case for the emergers, and indeed those that float may do so because they are not financially open.

Second, in section 9.3 we elaborate on the financial vulnerability hypothesis, which is related to the recent literature on original sin. Descriptive material from the pre-1914 history of the periphery paints a very familiar picture of financially "backward" countries required to borrow abroad in sterling, francs, or marks, or with gold clauses, being hammered by the crises of the 1890s, forced to devalue and default, and then devoting considerable resources to obtain the gold reserves needed to adhere to gold as if on a currency board (Russia, Greece) or floating but restricting foreign borrowing (Spain, Portugal)—hollowing-out déjà vu. Future research will have to explain the reasons for the inability many countries have faced, and most probably will continue to face, when borrowing abroad.

Finally, in section 9.4 we present some empirical findings for the pre-1914 period showing a clear connection between the ability to borrow abroad in domestic currency, gold adherence, and financial depth. Extending our methodology to the post-1973 era led to identical results for the advanced countries whose dominant exchange rate regime is now floating (with the exception of the European experiment with a monetary union).

For the emerging countries, however, it appears as if those that are financially open, especially the Latin American countries, have difficulty floating because they do suffer from original sin as evidenced in their inability to borrow abroad in domestic currencies. They tend to have greater financial depth when they have fixed rates. For Asia, floating exchange rates are associated with one measure of greater financial depth, but this may be be-

cause it is less financially open. For another measure fixed rates and financial depth go hand in hand, similar to the experiences of Latin America.

In conclusion, the dynamics of the international monetary system and the evolution of the exchange rate regime can be understood as being complex, involving both the financial development of countries and international financial integration. Financial crises such as those in the 1890s and the 1990s are the defining moments that reveal the regime fault lines between advanced and emerging countries. The evolution from the gold standard to floating by the advanced countries required achieving financial maturity, and the same will ultimately be required for the rest of the world. In the interim, the panoply of intermediate arrangements with varying forms of government intervention, including impediments to the free flow of capital, will prevail. Financial crises as occurred in the 1890s and the 1990s will also continue to be an important part of the process of regime evolution as an ultimate structuring force.

Appendix

Data Sources

1880–1913

M2. Data appendix to Bordo et al. (2001; available on request) for all countries except the following: Austria, Komlos (1987); Chile, Bordo and Rockoff (1996); Greece, Kostelenos (1995); the Netherlands and Norway, Bordo and Jonung (2001); Portugal, Bordo and Schwartz (1996); Russia, Drummond (1976).

Nominal GDP, real GDP, implicit price deflator, and CPI. Data appendix to Bordo et al. (2001) for all countries except the following: Austria, Komlos (1987); Chile, Bordo and Rockoff (1996); Greece, Kostelenos (1995); Russia, Drummond (1976).

Population. Data appendix to Bordo et al. (2001) for all countries except the following: Austria, Crédit Lyonnais economic studies; the Netherlands, Russia and Switzerland, Mitchell (1992).

Short-term interest rates. Argentina, data provided by Alan Taylor from Obstfeld and Taylor (ch. 3 in this volume); Austria, *The Economist;* Australia, Bordo and Rockoff (1996); Belgium, Mitchell (1992); Brazil, Global Financial Data; Canada, Bordo and Jonung (1987; we substituted long-term interest rates for short-term interest rates); Chile, Subercaseaux (1926); Denmark and Finland, constructed by Marc Flandreau from a variety of national official sources; France and Germany, Bordo (1993); Greece, data provided by Olga Charodonlakis; Italy, *The Economist;* Japan, Bordo; the Netherlands, Bordo and Jonung (1995); Norway, Flandreau;

Portugal, *The Economist;* Russia, *The Economist;* Spain, Sweden, and Switzerland, Flandreau; United Kingdom, Bordo; United States, Bordo.

Government finance (expenditures and tax receipts). Argentina and Austria, Mitchell (1992); Australia, David Pope (ANU); Belgium, Bordo and Jonung (2001); Brazil, Mitchell (1993); Canada, Bordo and Jonung; Chile, Mitchell (1993); Denmark, Finland, France, and Germany, Bordo and Jonung; Greece, Mitchell (1992); Italy, Japan, the Netherlands, and Norway, Bordo and Jonung; Portugal, Russia, and Spain, Mitchell (1992); Sweden, Switzerland, the United Kingdom, and the United States, Bordo and Jonung.

1973–1997

M2, nominal GDP, real GDP, population, implicit price deflator and CPI, and government expenditures and tax receipts. Forty-four countries, twenty-two advanced countries, and twenty-two emerging countries: See data appendix to Bordo et al. (2001).

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Comment

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The question the paper is designed to answer is how to account for the different exchange rate regimes that countries adopted during the era of globalization before the First World War and during the second era of globalization post–Bretton Woods. The authors offer three different approaches to answer the question: They provide correlation tests between saving and investment panel data; they discuss financial immaturity before 1914 in terms of the need by capital-poor countries to include gold clauses in debt instruments and denote the ability to borrow abroad in domestic currency as a hallmark of gold adherence and financial depth; and they estimate money demand equations to test the difference in financial depth between capital-rich and –poor.

Let me note why I prefer a distinction between capital-rich and capital-poor rather than core and periphery, the authors' choice. The core-peripheral classification seems an apt one applied to the gold standard world. For this paper, which concerns globalization, a better choice for classifying the two sets of countries would have been capital-rich and capital-poor. Foreign direct investment flows not only from the capital-rich to the capital-poor, which is often discussed in globalization studies, but in the current era increasingly from one capital-rich country to other capital-rich countries.

The focus of the paper is on why the capital-rich countries adopted fixed

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exchange rates during the first era of globalization and, during the second era of globalization, except for the European Union (hardly as minor an exception as the paper implies), adopted the radically opposite system of floating exchange rates. The capital-poor countries, on the other hand, the authors say, have been "surprisingly consistent"; they tried unsuccessfully to adhere to the gold standard during the first era of globalization and ended up with currency boards, close to 100 percent gold reserves, or floating exchange rates and, in the second era, have had trouble maintaining floating rates and have pegged to capital-rich-country currencies. The "consistency" must refer to the variety of exchange rate system choices in both eras of globalization by capital-poor countries. I doubt the reference to currency boards during the first era. Colonial countries then had currency boards, dictated by the imperial country. Colonial countries had no voice in the choice.

The explanation the paper offers for the differential exchange rate arrangements of the two classes of countries in the two eras hinges on the attainment of financial maturity. Financial maturity encompasses the development of wide and deep financial markets and sound fiscal and monetary arrangements. For the capital-rich countries, reaching that nirvana allowed them to float in the second era. I do not accept this explanation for their decision to float post–Bretton Woods. What seems more likely is that these countries fixed their exchange rates before the First World War because that seemed the only way to avoid inflation, but they later learned that floating freed monetary policy and that it was possible to avoid inflation if monetary policy was conducted to that end.

The authors regard the current episode of floating as proof of financial maturity and the exchange rate regime to which all countries should aspire. Barely twenty years ago, floating rates were held to be temporary arrangements that would be succeeded by fixed rates in the absence of shocks. It is premature for economic historians to describe the brief experience of floating free of inflation since the 1990s as a durable system. History is a record of repeated reversals between fixed and floating.

Financial immaturity may be an adequate explanation for the failure of capital-poor countries to adhere to the gold standard in the first era. When they then floated and devalued, they suffered losses imposed on them as borrowers in the international capital market because interest payments and principal were denominated in the currencies of capital-rich countries. That experience clarified the advantage of adopting the gold standard, but failed monetary and fiscal policies undermined their adherence. Financial immaturity may also explain why capital-poor countries that tried fixing had to shift to floating rates of exchange in the current era of globalization and learned that floating was no panacea. Financial immaturity may be a euphemism for misguided monetary and fiscal policies.

Section 9.2 uses correlation tests between saving and investment panel

data to measure the degree of financial integration. The pre-1914 subgroup of gold standard countries did not achieve greater financial openness than the entire complement of countries. In the interwar years, gold standard and sterling area countries were less financially integrated than the entire complement of countries. The paper attributes this result to the presence of capital controls that reduced integration. All in all, the paper concludes that because the pre-1914 sample with fixed exchange rates and no capital controls was only imperfectly integrated, the gold standard was not the reason globalization occurred. Globalization was the reason the gold standard was adopted. Small differences in the correlation results are the basis for this conclusion.

For 1973–97, the paper presents saving and investment correlation estimates for a sample, subgrouped into developed, total emerging, emerging Asia, and emerging Latin American countries, classified as participating in one of three types of exchange rate regime (fixed, intermediate, or floating) associated with higher or lower levels of integration. Asian countries are less open than the average, Latin American countries more open. With respect to alternative exchange rate regimes, developed countries are more integrated whether they fix or float, with the fixers tending to be smaller countries.

The conclusion the paper reaches in section 9.2 is that European integration in the second era of globalization is a result of liberalization of financial services rather than a result of the exchange rate regime. Whether fixed or floating, capital-rich countries have implemented financial openness. Financial integration in Latin American countries, however, according to the paper, has forced the adoption of either fixed or floating rate regimes. The authors find that Asia has retained all three exchange rate regimes because it has remained more financially closed than the rest of the world. The exchange rate regime is a product of globalization. The authors believe that globalization has polarized the choice of exchange rate regimes between floating and fixing—a result known as hollowing out. In fact, an exchange rate regime does not exist in a vacuum. Whatever the choice, it can succeed only if a country's policy decisions are sound and its institutions—labor markets, fiscal arrangements, legal framework—function well.

Section 9.3 provides a discussion of exchange rate regimes, financial crises, and financial maturity. The paper inquires whether exchange rate problems today differ from nineteenth-century problems, and answers no. The capital-poor adopted the gold standard before 1914 as an insurance mechanism against international financial disturbances. The gold standard for them was an endogenous response to gold clauses. For the capital-rich which had developed strong money and financial markets before 1914 and could issue debt in their own currency, however, floating should have been preferred, but they did not float. The explanation, according to the paper, is that the capital-rich, by using exchange rate adjustments within the gold

points, were as flexible as possible. In the second era of globalization, they have finally been able to exploit their ability to float.

It used to be said that there was leeway under the gold standard in the short term for monetary authorities to delay adjustment. However, the leeway is explained differently by the authors, who describe it in terms of the fluctuation bands between the gold export point and the gold import point, within which bands monetary authorities could buffer transitory shocks. The gold standard bands thus served as a conceptual target zone. On this view, there is less of a difference between the degree of flexibility of the pre-1914 gold standard and the post–Bretton Woods floating rate that capital-rich countries have favored. In any event, although I believe that there was a degree of short-term flexibility under the gold standard, it was far from the flexibility of a float. The paper makes too much of this supposed similarity. Moreover, there is no justification for the authors' belief that there should be such a similarity.

Capital-poor countries had trouble pegging before 1914 because of current account and terms-of-trade shocks, and were especially vulnerable to world deflation during 1873–96. Adopting gold did not immediately win them credibility and lower short-term interest rates. Their interest rates were persistently higher before 1914 than discount rates of the capital-rich countries. Pegging was a problem for the capital-poor during both the first and second globalization eras. If fixing posed problems before 1914 for the capital-poor, and floating did the same in the current era, one common reason was that they borrowed from the capital-rich in the latter's currencies. Early on, the capital-poor had to issue securities with a fixed exchange rate clause that tied the coupon to the currency of the market where they were sold. When the gold standard became widespread, this practice became gold clauses. Exchange risk was assumed by capital-poor issuers, whether governments or corporations. Mere linking of the local currency to gold was not enough to enable a country to issue obligations in its own currency. Only a narrow list of countries could issue debt in their own currency.

The paper argues that before 1914 this condition prevented the capital-poor from developing well-organized domestic financial markets. They could not attract foreign bank deposits, but were dependent on bank loans from merchant banks in capital-rich countries that were denominated in the currencies of the capital-rich. For this reason the capital-poor countries were vulnerable to financial crises. If their spending increased, the share of debt denominated in gold rose in relation to the debt-GDP ratio. The mismatch between the currency in which debt was denominated and the local currency aggravated the debt burden when the local currency depreciated.

This explanation of financial crises before and since 1914 provides a lesson that the capital-poor countries should learn. The paper refers to the response of Spain and Portugal that floated but minimized their exposure by avoiding borrowing abroad.

In section 9.4, the paper compares the effects of alternative exchange rate regimes in 1880–1914 and 1973–97 on financial depth, proxied by the ratio of broad money to GDP.

The paper concludes that the key difference between capital-rich and capital-poor countries is that the former enjoy financial maturity, manifested in open and domestic financial markets, stable money, and fiscal probity. The capital-rich can issue debt denominated in domestic currency. Countries that are financially mature in a world of open capital markets should be able to float as do capital-rich countries.

I ask the authors: If you believe that globalization isn't conditional on any particular exchange rate regime, and it was feasible before 1914 with a predominantly gold standard, and has been feasible since the mid-1970s with a predominantly floating rate regime, why are you so eager to portray the gold standard as really not so different from a floating rate regime?

Also, you claim that we will know that the capital-poor are financially mature when they successfully adopt floating. I believe that we will know that they are financially mature when they adopt sound monetary and fiscal policies with the appropriate institutional infrastructure. Whatever exchange rate financially mature capital-poor countries adopt will then work well.