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Author: Maurice Obstfeld, Alan M. Taylor

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Globalization and Capital Markets

Maurice Obstfeld and Alan M. Taylor

3.1 Global Capital Markets: Overview and Origins

At the turn of the twenty-first century, the merits of international financial integration are under more forceful attack than at any time since the 1940s. Even mainstream academic proponents of free multilateral commodity trade, such as Bhagwati, argue that the risks of global financial integration outweigh the benefits it affords. Critics from the left such as Eatwell, more skeptical even of the case for free trade on current account, suggest that since the 1960s "free international capital flows" have been "associated with a deterioration in economic efficiency (as measured by growth and unemployment)" (Eatwell 1997, 2).[1]

The resurgence of concerns over international financial integration is understandable in light of the financial crises in Latin America in 1994–95,

Maurice Obstfeld is the Class of 1958 Professor of Economics at the University of California–Berkeley and a research associate of the National Bureau of Economic Research. Alan M. Taylor is professor of economics at the University of California–Davis and a research associate of the National Bureau of Economic Research.

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1. See Bhagwati (1998) and Eatwell. For a skeptical perspective on the future prospects of economic integration in general, see Rodrik (2000).

East Asia and Russia in 1997–98, and Argentina in 2001–02. Proponents of free trade in tangible goods have long recognized that its net benefits to countries typically are distributed unevenly, creating domestic winners and losers. But recent international financial crises have submerged entire economies and threatened their trading partners, inflicting losses all around. International financial transactions rely intrinsically on the expectation that counterparties will fulfill future contractual commitments; they therefore place confidence and possibly volatile expectations at center stage.[2] These same factors are present in purely domestic financial trades, of course; but oversight, adjudication, and enforcement all are orders of magnitude more difficult among sovereign nations with distinct national currencies than within a single national jurisdiction. Moreover, there is no natural world lender of last resort, so international crises are intrinsically harder to head off and contain. Factors other than the threat of crises, such as the power of capital markets to constrain domestically oriented economic policies, also have sparked concerns over greater financial openness.

The ebb and flow of international capital since the nineteenth century illustrates recurring difficulties, as well as the alternative perspectives from which policymakers have tried to confront them. The subsequent sections of this paper are devoted to documenting these vicissitudes quantitatively and explaining them. Economic theory and economic history together can provide useful insights into events of the past and deliver relevant lessons for today. We argue that theories of how international capital mobility has evolved must be understood within the framework of the basic policy trilemma constraining an open economy's choice of monetary regime.

3.1.1 The Emergence of World Capital Markets

Prior to the nineteenth century, the geographical scope for international finance was relatively limited compared to what was to come. Italian banks of the Renaissance financed trade and government around the Mediterranean, and as trade expanded within Europe, financial innovations spread farther north through the letters of credit developed at the Champagne Fairs and the new banks in North Sea ports such as Bruges and Antwerp. Later, London and Amsterdam became the key centers, and their currencies and financial instruments were the principal focus of market players. As the industrial revolution gathered force and radiated out from Great Britain, the importance of international financial markets became more apparent in both the public and private spheres.[3]

In due course, the scope for such trades extended to other centers that developed the markets and institutions capable of supporting international financial transactions, and whose governments were not hostile to such de-

2. The vast majority of commodity trades also involve an element of intertemporal exchange, via deferred or advance payment for goods, but the unwinding of the resulting cross-border obligations tends to be predictable.

3. See Cameron (1993); Neal (1990, 2000); Oppers (1993); Brezis (1995).

velopments. In the eastern United States, a broad range of centers including Boston, Philadelphia, and Baltimore gave way to what became the dominant center of national and international finance, New York. By the late nineteenth century, both France and Germany had developed sophisticated and expanding international markets, well integrated into the networks of global finance. Elsewhere in Europe and the New World similar markets began from an embryonic stage, and eventually financial trading spread to places as far afield as Melbourne and Buenos Aires.[4]

As we shall discuss later, after 1870 these developments were to progress even further. With the world starting to converge on the gold standard as a monetary system, and with technological developments in shipping (e.g., steamships' replacing sail; the Panama Canal) and communications (the telegraph, transoceanic cables), the first global marketplace in capital, as well as in goods and labor, took shape in an era of undisputed liberalism and virtual laissez-faire.

Within finance, the technological and institutional developments were many: the use of modern communications to transmit prices; the development of a very broad array of private debt and equity instruments, and the widening scope for insurance activities; the expanding role of government bond markets internationally; and the more widespread use of forward and futures contracts, and derivative securities. By 1900, the use of such instruments permeated the major economic centers of dozens of countries around the world, stretching from Europe, east and west, north and south, to the Americas, Asia, and Africa. The key currencies and instruments were known everywhere, and formed the basis for an expanding world commercial network, whose rise was equally meteoric. Bills of exchange, bond finance, equity issues, foreign direct investments, and many other types of transactions were by then quite common among the core countries, and among a growing number of nations at the periphery.

Aside from haute finance, more and more day-to-day activities came into the orbit of finance via the growth and development of banking systems in many countries, offering checking and saving accounts as time passed. This in turn raised the question of whether banking supervision would be done by the banks themselves or the government authorities, with solutions including free banking and "wildcat" banks (as in the United States), and changing over time to include supervisory functions as part of a broader central monetary authority, the central bank. From what was once an esoteric sector of the economy, the financial sector grew locally and globally to touch an ever-expanding range of activity.[5]

4. On the United States see Davis (1965) and Sylla (1975, 1998). On Europe see Kindleberger (1984). For a comprehensive discussion of the historical and institutional developments in some key countries where international financial markets made an impact at this time—the United Kingdom, the United States, Australia, Argentina, and Canada—see Davis and Gallman (2001). On comparative financial deepening and sophistication see Goldsmith (1985).

5. On financial development, see chapter 8, by Rousseau and Sylla, in this volume.

Thus, the scope for capital markets to do good—or do harm—loomed larger as time went by. As an ever-greater part of national and international economies became monetized and sensitive to financial markets, agents in all spheres—public and private, labor and capital, domestic and foreign—were affected. Who stood to gain or lose? What policies would emerge as government objectives evolved? Would global capital markets proceed unfettered or not? From the turn of the twentieth century, the unfolding history of the international capital market has been of enormous import. At various times the market has shaped the course of national and international economic development and swayed political interests in all manner of directions. In terms of distribution and equality, it has made winners and losers, although so often is the process misunderstood that the winners and losers are often unclear, at the national and the global level. An aim of this paper is to tell the history of what became a truly *global* capital market on the eve of the twentieth century, and explore how it has influenced the course of events ever since.

3.1.2 Stylized Facts for the Nineteenth and Twentieth Centuries

Notwithstanding the undisputed record of technological advancement and economic growth over the long run, we must reject the temptations of a simple linear history as we examine international capital markets and their evolution. It has not been a record of ever-more-perfectly functioning markets with ever-lower transaction costs and ever-expanding scope. The mid-twentieth century, on the contrary, was marked by an enormous reaction against markets, international as well as domestic, and against financial markets in particular.[6] Muted echoes of these same themes could be heard once again at the end of the twentieth century.

What do we already know about the evolution of global capital mobility in the last century or more? Very few previous studies exist for the entire period and covering a sufficiently comprehensive cross-section of countries; but many authors have focused on individual countries and particular epochs, and from their work we can piece together a working set of hypotheses that might be termed the conventional wisdom concerning the evolution of international capital mobility in the post-1870 era. The story comes in four parts, and not coincidentally these echo the division of the twentieth century into distinct international monetary regimes.[7]

The first period runs up to 1914. After 1870 an increasing share of the world economy came into the orbit of the classical gold standard, and a global capital market centered on London. By 1880, quite a few countries were on gold, and by 1900 a large number. This fixed exchange rate system

6. See Polanyi (1944).

7. On this division of history see, in particular, Eichengreen (1996). Earlier surveys of the progress of financial market globalization since the nineteenth century include Obstfeld and Taylor (1998), Bordo, Eichengreen, and Kim (1999), and Flandreau and Rivière (1999).

was for most countries a stable and credible regime, and functioned as a disciplining or commitment device. Accordingly, interest rates across countries tended to converge, and capital flows surged. Many peripheral countries, not to mention the New World offshoots of western Europe, took part in an increasingly globalized economy in not only the capital market, but also the goods and labor markets.[8]

In the second period, from 1914 to 1945, this global economy was destroyed. Two world wars and a Great Depression accompanied a rise in nationalism and increasingly noncooperative economic policymaking. With gold-standard credibility broken by World War I, monetary policy became subject to domestic political goals, first as a way to help finance wartime deficits. Later, monetary policy was a tool to engineer beggar-thy-neighbor devaluations under floating rates. As a guard against currency crises and to protect gold, capital controls became widespread. The world economy went from globalized to almost autarkic in the space of a few decades. Capital flows were minimal, international investment was regarded with suspicion, and international prices and interest rates fell completely out of synchronization. Global capital (along with finance in general) was demonized, and seen as a principal cause of the world depression of the 1930s.[9]

In the third period, the Bretton Woods era (1945–71), an attempt to rebuild the global economy took shape. Trade flows began a remarkable expansion, and economic growth began its most rapid spurt in history worldwide. Yet fears formed in the interwar period concerning global capital were not easily dispelled. The International Monetary Fund (IMF) initially sanctioned capital controls as a means to prevent currency crises and runs, and this lent some autonomy to governments by providing more power to activist monetary policy. For twenty years, this prevailing philosophy held firm; and although capital markets recovered, they did so slowly. But by the late 1960s global capital could not be held back so easily, and its workings eventually broke the compromise that had sustained the fixed exchange rate system.[10]

In the fourth and final period, the post–Bretton Woods floating-rate era, a different trend has been evident. Although fixed-rate regimes were reluctantly given up, and although some countries still attempt to maintain or create such regimes anew, the years from the 1970s to the 1990s have been characterized by a seeming increase in capital mobility. Generally speaking,

8. On the gold standard regime and late-nineteenth-century capital markets see, inter alia, Eichengreen (1996); Eichengreen and Flandreau (1996); Bordo and Kydland (1995); Bordo and Rockoff (1996); Edelstein (1982). On this first era of globalization in goods and factor markets see Sachs and Warner (1995); Williamson (1996); O'Rourke and Williamson (1999); and chapters 1 (by Findlay and O'Rourke) and 2 (by Chiswick and Hatton) in this volume.

9. See Eichengreen (1992, 1996) and Temin (1989). In labor markets migrations collapsed and in goods markets trade barriers multiplied (Kindleberger 1986, 1989; Williamson 1995; James 2001).

10. On Bretton Woods see, for example, Bordo and Eichengreen (1993); Eichengreen (1996).

industrial-country governments no longer needed capital controls as a tool to help preserve a fixed exchange rate peg, since the peg was gone. As a floating rate could accommodate market developments, controls could be lifted. This was encouraging to the flow of capital in all countries. In peripheral countries, economic reforms reduced the transactions costs and risks of foreign investment, and capital flows grew there, too—at least until the crises of the later 1990s reminded investors of the fragility of the fixed-rate regimes that tended to persist in the developing world. Increasingly, the smaller peripheral countries that desire fixed exchange rates seek credibly to give up domestic monetary policy autonomy through currency boards or even dollarization, whereas larger developing countries such as Mexico, Chile, and Brazil have opted for exchange rate flexibility coupled with inflation targeting.

In the 1990s, the term *globalization* has became a catch-all to describe the phenomenon of an increasingly integrated and interdependent world economy, one that exhibits supposedly free flows of goods, services, and capital, albeit not of labor. Yet for all the hype, economic history suggests we be a little cautious in assessing how amazing this development really is. We will show that a period of impressive global integration has been witnessed before, at least for capital markets—at the turn of the twentieth century, just about a hundred years ago. Of course, that earlier epoch of globalization did not endure. As the above discussion suggests, if we were roughly to sketch out the implied movements in capital mobility, we would chart an upswing from 1880 to 1914; this would be followed by a collapse to 1945, although perhaps with a minor recovery during the brief reconstruction of the gold standard in the 1920s, between the autarky of World War I and the Depression; we would then think of a gradual rise in mobility after 1945, becoming faster after the demise of Bretton Woods in the early 1970s.

For illustrative purposes, let us make the tenuous assumption that international capital mobility or global capital market integration *could* be measured on a single parameter. Suppose we could plot that parameter over time for the last century or so. We would then expect to see a time path something like figure 3.1, where the vertical axis carries the mobility or integration measure. It is reasonable, given the specific histories of various subperiods or certain countries, as contained in numerous fragments of the historical literature, to speak of capital mobility increasing or decreasing at the times we have noted. Thus, the overall U-shaped trend line indicated by the figure is probably correct.

However, without further quantification the usefulness of the stylized view remains unclear. For one thing, we do not know if it accords with empirical measures of capital mobility. Moreover, even if we know the direction of changes in the mobility of capital at various times, we cannot measure the extent of those changes. Without such evidence, we cannot assess whether the U-shaped trend path is complete: That is, have we now reached

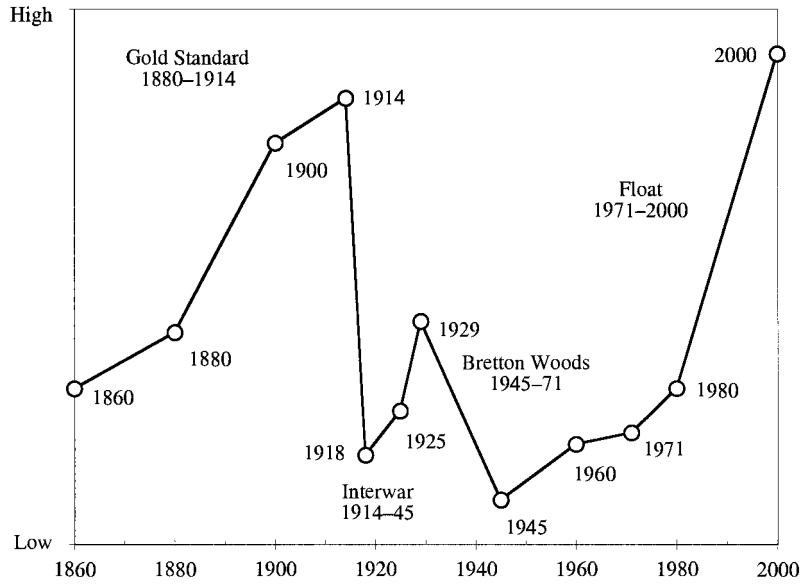

Fig. 3.1 Conjecture? A stylized view of capital mobility in modern history
Source: Introspection.

a degree of capital mobility that is above, or still below, that seen in the years before 1914? To address these questions requires more formal empirical testing, and that is one of the motivations for the quantitative analysis that follows.

3.1.3 The Trilemma: Capital Mobility, the Exchange Rate, and Monetary Policy

We seek in this paper not only to offer evidence in support of the stylized view of global capital market evolution, but also to provide an organizing framework for understanding that evolution and the forces that shaped the international economy of the late nineteenth and twentieth centuries. Given the stylized description, we must address the following question: What explains the long stretch of high capital mobility that prevailed before 1914, the subsequent breakdown in the interwar period, and the very slow postwar reconstruction of the world financial system? The answer is tied up with one of the central and most visible areas in which openness to the world capital market constrains government power: the choice of an exchange rate regime.[11]

The *macroeconomic policy trilemma* for open economies (also known as

11. This section draws on Obstfeld and Taylor (1998), who invoked the term "trilemma," and Obstfeld (1998).

the *inconsistent trinity* proposition) follows from a basic fact: An open capital market deprives a country's government of the ability simultaneously to target its exchange rate and to use monetary policy in pursuit of other economic objectives. The trilemma arises because a macroeconomic policy regime can include, at most, two elements of the inconsistent trinity of three policy goals:

1. full freedom of cross-border capital movements
2. a fixed exchange rate
3. an independent monetary policy oriented toward domestic objectives

If capital movements are prohibited, in the case where element (1) is ruled out, a country on a fixed exchange rate can break ranks with foreign interest rates and thereby run an independent monetary policy. Similarly, a floating exchange rate, in the case where element (2) is ruled out, reconciles freedom of international capital movements with monetary-policy effectiveness (at least when some nominal domestic prices are sticky). But monetary policy is powerless to achieve domestic goals when the exchange rate is fixed and capital movements free, the case where element (3) is ruled out, since intervention in support of the exchange parity then entails capital flows that exactly offset any monetary-policy action threatening to alter domestic interest rates.[12]

Our central proposition is that secular movements in the scope of international lending and borrowing may be understood in terms of this trilemma. Capital mobility has prevailed and expanded under circumstances of widespread political support either for an exchange-rate-subordinated monetary regime (e.g., the gold standard), or for a monetary regime geared mainly toward domestic objectives at the expense of exchange rate stability (e.g., the recent float). The middle ground in which countries attempt simultaneously to hit exchange rate targets and domestic policy goals has, almost as a logical consequence, entailed exchange controls or other harsh constraints on international transactions.

It is this conflict among rival policy choices, the trilemma, that informs our discussion of the historical evolution of world capital markets in the

12. The choice between fixed and floating exchange rates should not be viewed as dichotomous; nor should it be assumed that the choice of a floating-rate regime necessarily leads to a useful degree of monetary policy flexibility. In reality, the degree of exchange rate flexibility lies on a continuum, with exchange rate target zones, crawling pegs, crawling zones, and managed floats of various other kinds residing between the extremes of irrevocably fixed and freely floating. The greater the attention given to the exchange rate, the more constrained monetary policy is in pursuing other objectives. Indeed, the notion of a "free" float is an abstraction with little empirical content, as few governments are willing to set monetary policy without some consideration of its exchange rate effects. Even under a free float, autonomy could be compromised. If floating exchange rates are subject to persistent speculative shocks unrelated to economic fundamentals, and if policymakers are concerned to counter these movements, then monetary control will be compromised.

pages that follow, and helps make sense of the ebb and flow of capital mobility in the long run and in the broader political-economy context.

Of course, the trilemma is only a proximate explanation, in the sense that deeper sociopolitical forces explain the relative dominance of some policy targets over others. Cohen (1996, 274–75) usefully distinguishes four potential categories of explanation concerning the evolution of international financial integration. We paraphrase his categories by distinguishing explanations based upon

1. technological innovation, including resulting increases in market competition;
2. policy competition among governments seeking to advance "state interest," somehow defined;
3. domestic politics, including partisan rivalry and interest-group lobbying;
4. ideology and advances in economic knowledge.

We view explanations based on technology as secondary for the period of interest to us (starting in the latter part of the nineteenth century), as it follows the deployment of transoceanic cable technology.[13] The precise definition of *state interest* may well reflect the domestic political power structure, so explanations of classes (2) and (3) need not be disjoint. Yet there may be situations in which there is a broad domestic consensus regarding certain policies as in the national interest. Similarly, ideology and the state of knowledge can determine the policies that states pursue in seeking a given perceived national interest. As will become clear in what follows, we regard explanations along the lines of (2) and especially (3) as the "deep factors" behind movements in international financial integration, with a supporting role for (4) as well.[14] The central role of the trilemma is to constrain the choice set within which the deep factors play their roles.

3.1.4 A Brief Narrative

The broad trends and cycles in the world capital market that we will document reflect changing responses to the fundamental trilemma. Before 1914, each of the world's major economies pegged its currency's price in terms of gold, and thus, implicitly, maintained a fixed rate of exchange against every other major country's currency. Financial interests ruled the world of the classical gold standard and financial orthodoxy saw no alter-

13. We recognize, however, that technology- or policy-driven changes in the extent of goods-market integration might affect some measures of financial integration, as in the analysis of Obstfeld and Rogoff (2000).

14. Rajan and Zingales (2001) place interest-group politics at center stage in their theory of domestic financial market liberalization. They find a U-shaped evolution of domestic financial evolution reminiscent of the pattern for international integration that we document in this paper. While they seem to view international capital mobility as basically exogenous to the process of domestic liberalization, we would view the two as jointly determined by the deeper factors.

native mode of sound finance.[15] Thus, the gold standard system met the trilemma by opting for fixed exchange rates and capital mobility, sometimes at the expense of domestic macroeconomic health. Between 1891 and 1897, for example, the U.S. Treasury put the country through a harsh deflation in the face of persistent speculation on the dollar's departure from gold. These policies were hotly debated; the Populist movement agitated forcefully against gold, but lost.[16]

The balance of political power began to shift only with the First World War, which brought a sea change in the social contract underlying the industrial democracies. For a sample of industrial countries, figure 3.2 shows the Polity IV coding for "institutional democracy" as it evolved over the period bracketing the First World War (the coding ranges from 0 to 11; see Marshall and Jaggers n.d. for details). Other than for the United States (which has a constant score of 10 throughout the sample period, and is omitted from the figure) there is clear evidence of a discrete increase in political openness in the decade or so after 1918.[17] Organized labor emerged as a political power, a counterweight to the interests of capital, as seen in the British labor unrest of the 1920s, which culminated in a general strike. Great Britain's return to gold in 1925 led the way to a restored international gold standard and a limited resurgence of international finance, but weaknesses in the rebuilt system helped propagate a global depression after the 1929 U.S. downturn.

Following (and in some cases anticipating) Great Britain's example, many countries abandoned the gold standard in the early 1930s and depreciated their currencies; many also resorted to trade and capital controls in order to manage independently their exchange rates and domestic policies. Those countries in the "gold bloc," which stubbornly clung to gold through the mid-1930s, showed the steepest output and price-level declines. James's (2001, 189–97) account of French policymakers' vacillation between controls and devaluation well illustrates the interaction between political pressures and the trilemma. Eventually, in the 1930s, all countries jettisoned rigid exchange rate targets and open capital markets in favor of domestic macroeconomic goals.[18]

15. See Bordo and Schwartz (1984); Eichengreen (1996).

16. Frieden's (1997) econometric evidence shows how financial interests promoted U.S. adherence to gold, whereas those who would have gained from currency depreciation favored silver. A similar debate over the monetary regime arose in Germany, where Prussian agriculture estate owners lobbied for relaxing the restraints of the gold standard (but were much more successful at getting tariff protection). See Gerschenkron (1943, 57n. 62).

17. The variable is composed of separate codings for the "competitiveness of political participation," the "openness and competitiveness of executive recruitment," and "constraints on the chief executive." We do not plot the variable during periods of political interruption or transition. These data are comparable to the Polity III source used to construct the index of global democratization presented by Niall Ferguson in the panel discussion that concludes this volume.

18. See Eichengreen and Sachs (1985); Temin (1989); Eichengreen (1992); Bernanke and Carey (1996); Obstfeld and Taylor (1998).

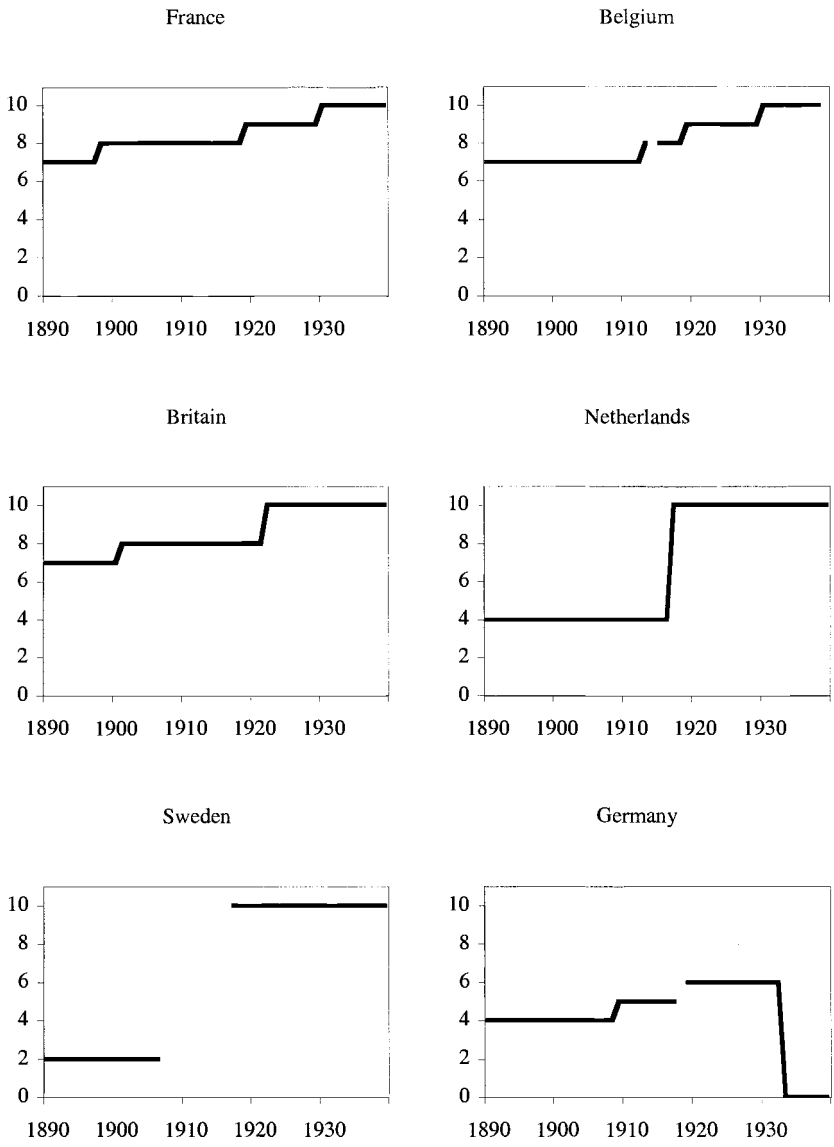

Fig. 3.2 Institutional democracy, Polity IV scores
Source: Marshall and Jaggers (n.d.).

These decisions reflected the shift in political power solidified by the First World War. They also signaled the beginnings of a new consensus on the role of economic policy that would endure through the inflationary 1970s. As an immediate consequence, however, the Great Depression discredited gold-standard orthodoxy and brought Keynesian ideas about macroeco-

nomic management to the fore. It also made financial markets and financial practitioners unpopular. Their supposed excesses and attachment to gold became identified in the public mind as causes of the economic calamity. In the United States, the New Deal brought a Jacksonian hostility toward eastern (read: New York) high finance back to Washington. Financial markets were more closely regulated, and the Federal Reserve was brought under heavier Treasury influence. Similar reactions occurred in other countries.

Changed attitudes toward financial activities and economic management underlay the new postwar economic order negotiated at Bretton Woods, New Hampshire, in July 1944. Forty-four allied countries set up a system based on fixed, but adjustable, exchange parities, in the belief that floating exchange rates would exhibit instability and damage international trade. At the center of the system was the IMF. The IMF's prime function was as a source of hard-currency loans to governments that might otherwise have to put their economies temporarily into recession to maintain a fixed exchange rate. Countries experiencing permanent balance-of-payments problems had the option of realigning their currencies, subject to IMF approval.[19]

Importantly, the IMF's founders viewed its lending capability as primarily a substitute for, not a complement to, private capital inflows. Interwar experience had given the latter a reputation as unreliable at best and, at worst, as a dangerous source of disturbances. Broad, encompassing controls over private capital movement, perfected in wartime, were expected to continue. The IMF's Articles of Agreement explicitly empowered countries to impose new capital controls. Articles VIII and XIV of the IMF agreement did demand that countries' currencies eventually be made convertible—in effect, freely saleable to the issuing central bank, at the official exchange parity, for dollars or gold. But this privilege was to be extended only if the country's currency had been earned through current account transactions. Convertibility on capital account, as opposed to current-account convertibility, was not viewed as mandatory or desirable.

Unfortunately, a wide extent even of current-account convertibility took many years to achieve, and even then it was often restricted to nonresidents. In the interim, countries resorted to bilateral trade deals that required balanced or nearly balanced trade between every pair of trading partners. If France had an export surplus with Great Britain, and Great Britain a surplus with Germany, then Great Britain could not use its excess deutsche marks to obtain dollars with which to pay France. Germany had very few dollars and guarded them jealously for critical imports from the Americas. Instead, each country would try to divert import demand toward countries with high demand for its goods, and to direct its exports toward countries whose goods were favored domestically.

19. On the Bretton Woods system, see Bordo and Eichengreen (1993).

Convertibility gridlock in Europe and its dependencies was ended through a regional multilateral clearing scheme, the European Payments Union (EPU). The clearing scheme was set up in 1950 and some countries reached de facto convertibility by mid-decade. But it was not until 27 December 1958 that Europe officially embraced convertibility and ended the EPU. Although most European countries still chose to retain extensive capital controls (Germany being the main exception), the return to convertibility, important as it was in promoting multilateral trade growth, also increased the opportunities for disguised capital movements. These might take the form, for example, of misinvoicing, or of accelerated or delayed merchandise payments. Buoyant growth encouraged some countries in further financial liberalization, although the United States, worried about its gold losses, raised progressively higher barriers to capital outflow over the 1960s. Eventually, the Bretton Woods system's very successes hastened its collapse by resurrecting the trilemma.[20]

Key countries in the system, notably the United States (fearful of slower growth) and Germany (fearful of higher inflation), proved unwilling to accept the domestic policy implications of maintaining fixed rates. Even the limited capital mobility of the early 1970s proved sufficient to allow furious speculative attacks on the major currencies, and after vain attempts to restore fixed dollar exchange rates, the industrial countries retreated to floating rates early in 1973. Although viewed at the time as a temporary emergency measure, the floating-dollar-rate regime is still with us thirty years later.

Floating exchange rates have allowed the explosion in international financial markets experienced over the same three decades. Freed from one element of the trilemma—fixed exchange rates—countries have been able to open their capital markets while still retaining the flexibility to deploy monetary policy in pursuit of national objectives. No doubt the experience gained after the inflationary 1970s in anchoring monetary policy to avoid price instability has helped to promote ongoing financial integration. Perhaps for the first time in history, countries have learned how to keep inflation in check under fiat monies and floating exchange rates.

There are several potentially valid reasons, however, for countries to still fix their exchange rates—for example, to keep a better lid on inflation or to counter exchange-rate instability due to financial market shocks. Such arguments may find particular resonance, of course, in developing countries. However, few countries that have tried to fix have succeeded for long; eventually, exchange rate stability tends to come into conflict with other policy objectives, the capital markets catch on to the government's predicament, and a crisis adds enough economic pain to make the authorities give in. In recent years only a very few major countries have observed the discipline of

20. See Triffin (1957); Einzig (1968); Bordo and Eichengreen (2001).

fixed exchange rates for at least five years, and most of those were rather special cases.[21]

The European Union members that maintained mutually fixed rates prior to January 1999 were aided by market confidence in their own planned solution to the trilemma, a near-term currency merger. Developing countries have generally not fared so well. Even Hong Kong, which operates a currency board supposedly subordinated to maintaining the Hong Kong–U.S. dollar peg, suffered repeated speculative attacks in the Asian crisis period. Another currency-board experiment, Argentina, held to its 1:1 dollar exchange rate from April 1991 for a remarkable stint of more than ten years. To accomplish that feat, the country relied on IMF and private credit and, despite episodes of growth, endured levels of unemployment higher than many countries could tolerate. It suffered especially acutely after Brazil moved to a float in January 1999. Three years later Argentina's political and economic arrangements disintegrated in the face of external default (December 2001) and currency collapse (January–February 2002).

For most larger countries, the trend toward greater financial openness has been accompanied—inevitably, we would argue—by a declining reliance on pegged exchange rates in favor of greater exchange rate flexibility. Some countries have opted for a different solution, however, adopting extreme straitjackets for monetary policy in order to peg an exchange rate. If monetary policy is geared toward domestic considerations, capital mobility or the exchange rate target must go. If, instead, fixed exchange rates and integration into the global capital market are the primary desiderata, monetary policy must be subjugated to those ends.

The details of this argument require a book-length discourse (Obstfeld and Taylor 2003), which allows a full survey of the empirical evidence and the historical record, but we can already pinpoint the key turning points (see table 3.1). The Great Depression stands as the watershed here, in that it was caused by an ill-advised subordination of monetary policy to an exchange rate constraint (the gold standard), which led to a chaotic time of troubles in which countries experimented, typically noncooperatively, with alternative modes of addressing the fundamental trilemma. Interwar experience, in turn, discredited the gold standard and led to a new and fairly universal policy consensus. The new consensus shaped the more cooperative postwar international economic order fashioned by Harry Dexter White and John Maynard Keynes, but implanted within that order the seeds of its own eventual destruction a quarter-century later. The global financial nexus that has evolved since then rests on a solution to the basic open-economy trilemma quite different than that envisioned by Keynes or White—one that allows considerable freedom for capital movements and gives the major currency areas freedom to pursue internal goals, but largely leaves their mutual exchange rates as the equilibrating residual.

21. See Obstfeld and Rogoff (1995).

Table 3.1 **The Trilemma and Major Phases of Capital Mobility**

	Sacrifices Countries Choose to Resolve Trilemma			
Era	Activist Policies	Capital Mobility	Fixed Exchange Rate	Notes
Gold standard	Most	Few	Few	Broad consensus
Interwar (when off gold)	Few	Several	Most	Capital controls, especially in Central Europe and Latin America
Bretton Woods	Few	Most	Few	Broad consensus
Float	Few	Few	Many	Some consensus, except currency boards, dollarization, etc.

3.1.5 Summary

As always, we have to consider the potential costs and benefits of international capital mobility for the national participants. Clearly, the ability to lend or borrow represents, trivially, a loosening of constraints relative to a perfectly closed economy. In this dimension, at least, open trade in financial markets offers unambiguous gains relative to a closed economy. Such trades permit insurance and the smoothing of shocks, and allow capital to seek out its highest rewards, implying the usual gains-from-trade results.

However, in other ways, international financial mobility raises concerns, particularly for policymakers attached to certain policy goals that may be inconsistent with the free flow of capital across international boundaries. In addition, the risks of financial and balance-of-payments crises—some of them self-fulfilling crises unrelated to "fundamentals"—may represent further obstacles to the adoption of free capital markets.

Although these are very much contemporary issues in world capital markets, the questions they raise can be traced back to the very founding of international financial markets centuries ago during the Renaissance. Then, too, advanced forms of financial asset trades developed very quickly, sometimes as a response to Church-imposed constraints such as usury proscriptions. Financial innovation was subject to suspicion from various quarters, both public and private. Thus, calls for the regulation and restriction of financial market activity have been with us since the earliest days.

Despite these fears, by the late nineteenth century a succession of technological breakthroughs, and a gradual institutional evolution, had positioned many nations in a newly forming international capital market. This network of nations embraced modern financial instruments and operated virtually free of controls on the part of governments. Under the gold standard monetary regime, this flourishing global market for capital reached at least a local peak in the decades just prior to World War I.

The subsequent history of the twentieth century showed that this seemingly linear path toward ever more technological progress and institutional sophistication in a liberal world order could indeed be upset. Two global

wars and a depression led the world down an autarkic path. Conflicting policy goals and democratic tensions often put the interests of global capital at a low premium relative to other objectives. Activist governments appealed to capital controls to sidestep the discipline of external markets, invoking monetary policy as a tool of macroeconomic control.

These events demonstrate the power of the macroeconomic policy trilemma to account for many of the ups and downs in global capital market evolution in the twentieth century. In the next section, we match up these stylized facts with details from the quantitative and institutional record, so as to better document the course of events. It is a remarkable history without which today's economic, financial, political, and institutional landscape cannot be fully understood.

3.2 Evidence

In theory and practice, the extent of international capital mobility can have profound implications for the operation of individual and global economies. With respect to theory, the applicability of various classes of macroeconomic models rests on many assumptions, and not the least important of these are axioms linked to the closure of the model in the capital market. The predictions of a theory and its usefulness for policy debates can revolve critically on this part of the structure.

The importance of these issues for policy is not surprising at all, and a moment's reflection on practical aspects of macroeconomic policy choice underscores the impact that capital mobility can have on the efficacy of various interventions: Trivially, if capital is perfectly mobile, this dooms to failure any attempts to manipulate local asset prices to make them deviate from global prices, including the most critical macroeconomic asset price, the interest rate. Thus, the feasibility and relevance of key policy actions cannot be judged, absent some informed position on the extent to which local economic conditions are in any way separable from global conditions. This means an empirical measure of market integration is implicitly, although rarely explicitly, a necessary adjunct to any policy discussion. Although recent globalization trends have brought this issue to the fore, this paper shows how the experience of longer-run macroeconomic history can clarify and inform these debates.

In attacking the problem of measuring market integration, economists have no universally recognized criterion to turn to. For example, imagine the simple expedient of examining price differentials: Prices would be identical in two identical neighboring economies, being determined in each by the identical structures of tastes, technologies, and endowments; but if the two markets were physically separated by an infinitely high transaction-cost barrier one could hardly describe them as being integrated in a single market, as the equality of prices was merely a chance event. Or consider looking at the size of flows between two markets as a gauge of mobility; this is an equally flawed criterion, for suppose we now destroyed the barrier be-

tween the two economies just mentioned, and reduced transaction costs to zero. We would then truly have a single integrated market, but because, on either side of the barrier, prices were identical in autarky, there would be no incentive for any good or factor to move after the barrier disappeared.

Thus, convergence of prices and movements of goods are not unambiguous indicators of market integration. One could run through any number of other putative criteria for market integration, examining perhaps the levels or correlations of prices or quantities, and find essentially the same kind of weakness: All such tests may be able to evaluate market integration, but only as a joint hypothesis test where some auxiliary assumptions are needed to make the test meaningful.

Given this impasse, a historical study such as the present paper is potentially valuable in two respects. First, we can use a very large array of data sources covering different aspects of international capital mobility over the last 100 years or more. Without being wedded to a single criterion, we can attempt to make inferences about the path of global capital mobility with a battery of tests, using both quantity and price criteria of various kinds. As long as important caveats are kept in mind about each method, especially the auxiliary assumptions required for meaningful inference, we can essay a broad-based approach to the evidence. Should the different methods all lead to a similar conclusion we would be in a stronger position than if we simply relied on a single test.

Historical work offers a second benefit in that it provides a natural set of benchmarks for our understanding of today's situation. In addition to the many competing tests for capital mobility, we also face the problem that almost every test is usually a matter of degree, of interpreting a parameter or a measure of dispersion or some other variable or coefficient. We face the typical empirical conundrums (how big is big? or how fast is fast?) in placing an absolute meaning on these measures.

A historical perspective allows a more nuanced view, and places all such inferences in a relative context: When we say that a parameter for capital mobility is big, this is easier to interpret if we can say that by this we mean bigger than a decade or a century ago. The historical focus of this paper will be directed at addressing just such concerns.[22] We examine the broadest range of data over the last 100-plus years to see what has happened to the degree of capital mobility in a cross-section of countries.[23]

22. But note that, again, auxiliary assumptions will be necessary, and the caveats will be considered along the way; for example, what if neighboring economies became exogenously more or less identical over time, but no more or less integrated in terms of transaction costs?

23. Given the limitations of the data, we will frequently be restricted to looking at between a dozen and twenty countries for which long-run macroeconomic statistics are available, and this sample will be dominated by today's developed countries, including most of the Organization for Economic Cooperation and Development (OECD) countries. However, we also have long data series for some developing countries such as Argentina, Brazil, and Mexico; and in some criteria, such as our opening look at the evolution of the stock of foreign investments, we can examine a much broader sample.

The empirical work begins by looking at quantity data, focusing on changes in the stocks of foreign capital over a century or more.[24] Subsequent empirical sketches focus on price-based criteria for capital market integration, looking at nominal interest arbitrage, real interest rate convergence, and equity returns.

3.2.1 Gross Stocks of Foreign Capital

In this section we examine the extant data on foreign capital stocks to get some sense of the evolution of the global market. We seek some measure of the size of foreign investment globally that is appropriately scaled and consistent over time.

Although the concept is simple, the measurement is not. Perhaps the simplest measure of the activity in the global capital market is obtained by looking at the total stock of overseas investment at a point in time. Suppose that the total asset stock in country or region i, owned by country or region j, at time t is A_{ijt}. Included in here is the domestically owned capital stock A_{ijt}. Of interest are two concepts: What assets of country j reside overseas, and what liabilities of country i are held overseas?

A relatively easy hurdle to surmount concerns normalization of the data; foreign investment stocks are commonly measured at a point in time in current nominal terms, in most cases U.S. dollars. Obviously, the growth of both the national and international economies might be associated with an increase in such a nominal quantity, as would any long-run inflation. These trends would have nothing to do with market integration per se. To overcome this problem, we elected to normalize foreign capital at each point in time by some measure of the size of the world economy, dividing through by a denominator in the form of a nominal size index.

A seemingly ideal denominator, given that the numerator is the stock of foreign-owned capital, would probably be the total stock of capital, whether financial or real. The problem with using financial capital measures is that they have greatly multiplied over the long run as financial development has expanded the number of balance sheets in the economy, thanks to the rise of numerous financial intermediaries.[25] This trend, in principle, could happen at any point in time without any underlying change in the extent of foreign asset holdings. The problem with using real capital stocks is that data construction is fraught with difficulty.[26]

24. Elsewhere we have examined flows of foreign capital, and more refined quantity criteria using the correlations of saving and investment over the long run (Obstfeld and Taylor 1998, 2003).

25. See Goldsmith (1985).

26. Only a few countries have reliable data from which to estimate capital stocks. Most of these estimates are accurate only at benchmark censuses, and in between census dates they rely on combinations of interpolation and estimation based on investment-flow data and depreciation assumptions. Most of these estimates are calculated in real (constant price) rather than nominal (current price) terms, which makes them incommensurate with the nominally mea-

Given these problems we chose a simpler and more readily available measure of the size of an economy, namely the level of output Y measured in current prices in a common currency unit.[27] Over short horizons, unless the capital-output ratio were to move dramatically, the ratio of foreign capital to output should be adequate as a proxy measure of the penetration of foreign capital in any economy. Over the long run, difficulties might arise if the capital-output ratio has changed significantly over time—but we have little firm evidence to suggest that it has.[28] Thus, as a result of these long-run data constraints, our analysis focuses on capital-to-GDP ratios of the forms

$$(1) \qquad \text{Foreign Assets-to-GDP Ratio}_{it} = \sum_{j \neq i} \frac{A_{jit}}{Y_{it}} \text{ and}$$

$$(2) \qquad \text{Foreign Liabilities-to-GDP Ratio}_{it} = \sum_{j \neq i} \frac{A_{ijt}}{Y_{it}}.$$

However, even with the concept established, measurement is still problematic in the case of the numerator. It is in fact very difficult to discover the extent of foreign capital in an economy using both contemporary and historical data. For example, the IMF has always reported balance-of-payments flow transactions in its *International Financial Statistics.* It is straightforward for most of the recent postwar period to discover the annual flows of equity, debt, or other forms of capital account transactions from these accounts. Conversely, it was only in 1997 that the IMF began reporting the corresponding stock data, namely, the international investment position of each country. These data are also more sparse, beginning in 1980 for fewer than a dozen countries, and expanding to about thirty countries by the mid-1990s.

The paucity of data is understandable, since the collection burden for these data is much more significant: Knowing the size of a bond issue in a single year reveals the flow transaction size; knowing the implications for future stocks requires, for example, tracking each debt and equity item and its fluctuating market value over time, and maintaining an aggregate of these data. The stock data are not simply a temporal aggregate of flows: The

sured foreign capital data. At the end of the day, we would be unlikely to find more than a handful of countries for which this technique would be feasible for the entire twentieth century, and certainly nothing like global coverage would be possible even for recent years.

27. For the GDP data we rely on Maddison's (1995) constant price 1990 U.S. dollar estimates of output for the period from 1820. These figures are then "reflated" using a U.S. price deflator to obtain estimates of nominal U.S. dollar "world" GDP at each benchmark date. This approach is crude, since, in particular, it relies on a purchasing power parity assumption. Ideally we would want historical series on nominal GDP and exchange rates, to estimate a common (U.S. dollar) GDP figure at various historical dates.

28. But for exactly the reasons just mentioned, since we have no capital stock data for many countries, it is hard to form a sample of capital-output ratios to see how these differ across time and space. The conventional wisdom is that the capital-output ratio ranges from three to four for most countries, although perhaps lower in capital-scarce developing countries.

stock value depends on past flows; capital gains and losses; any retirements of principal or buybacks of equity; defaults and reschedulings; and a host of other factors. Not surprisingly, accurate data of this type are hard to assemble.[29] Just as the IMF has had difficulty doing so, so too have economic historians. Looking back over the nineteenth and twentieth centuries an exhaustive search across many different sources yields only a handful of benchmark years in which estimates have been made, an effort that draws on the work of dozens of scholars in official institutions and numerous other individual efforts.[30]

It is based on these efforts that we can put together a fragmentary, but still potentially illuminating, historical description in table 3.2 and figure 3.3. Displayed here are nominal foreign investment and output data for major countries and regions, grouped according to assets and liabilities. Many cells are empty because data are unavailable, but where possible, summary data have been derived to illustrate the ratio of foreign capital to output, and the share of various countries in foreign investment activity.

What do the data show? On the asset side it is immediately apparent that for all of the nineteenth century, and until the interwar period, the British were rightly termed the "bankers to the world"; at its peak, the British share of total global foreign investment was almost 80 percent. This is far above the recent U.S. share of global foreign assets, a mere 22 percent in 1995, and still higher than the maximum U.S. share of 50 percent circa 1960. The only rivals to the British in the early nineteenth century were the Dutch, who according to these figures held perhaps 30 percent of global assets in 1825. This comes as no surprise given what we know of Amsterdam's early preeminence as the first global financial center before London's rise to dominance in the eighteenth and nineteenth centuries. By the late nineteenth century both Paris and Berlin had also emerged as major financial centers, and, as their economies grew and industrialized, French and German holdings of foreign capital rose significantly, each eclipsing the Dutch position.

In this era the United States was a debtor rather than a creditor nation, and was only starting to emerge as a major lender and foreign asset holder after 1900. European borrowing from the United States in World War I then suddenly made the United States a big creditor. This came at a time when she was ready, if not altogether willing, to assume the mantle of "banker to the world," following Great Britain's abdication of this position under the burden of war and recovery in the 1910s and 1920s.[31] But the dislocations of the interwar years were to postpone the United States' rise as a foreign creditor,

29. An important new source, however, is Lane and Milesi-Ferretti (2001). See below.

30. See, for example, Paish (1914), Feis (1931), Lewis (1938), Rippy (1959), Woodruff (1967), and Twomey (2000). Twomey, following Feinstein (1990), favors the estimates of Paish and the other aforementioned authors, versus the downward revisions to pre-1914 British overseas investment proposed by Platt (1986).

31. This Anglo-American transfer of hegemonic power is discussed by Kindleberger (1986) and by Bordo, Edelstein, and Rockoff (1999). Gallarotti (1995) challenges the view that Great Britain acted as a monetary hegemon up to 1914.

Table 3.2 **Foreign Capital Stocks**

	1825	1855	1870	1900	1914	1930	1938	1945	1960	1971	1980	1985	1990	1995
Assets														
United Kingdom	0.5[a]	0.7[a]	4.9[a]	12.1[a]	19.5[a]	18.2[a]	22.9[c]	14.2[a]	26.4[a]	—	551[d]	857[d]	1,760[d]	2,490[d]
France	0.1[a]	—	2.5[a]	5.2[a]	8.6[a]	3.5[a]	3.9[c]	—	—	—	268[d]	428[d]	736[d]	1,100[d]
Germany	—	—	—	4.8[a]	6.7[a]	1.1[a]	0.7[c]	—	1.2[a]	—	247[d]	342[d]	1,100[d]	1,670[d]
The Netherlands	0.3[a]	0.2[a]	0.3[a]	1.1[a]	1.2[a]	2.3[a]	4.8[c]	3.7[a]	27.6[a]	—	99[d]	178[d]	418[d]	712[d]
United States	0.0[a]	0.0[a]	0.0[a]	0.5[a]	2.5[a]	14.7[a]	11.5[c]	15.3[a]	63.6[a]	—	775[d]	1,300[d]	2,180[d]	3,350[d]
Canada	—	—	—	0.1[a]	0.2[a]	1.3[a]	1.9[c]	—	—	—	92[d]	129[d]	227[d]	302[d]
Japan	—	—	—	—	—	—	1.2[c]	—	—	—	160[d]	437[d]	1,860[d]	2,720[d]
Other Europe	—	—	—	—	—	—	4.6[c]	—	—	—	503[d]	715[d]	1,777[d]	2,855[d]
Other	—	—	—	—	—	—	6.0[c]	2.0[a]	5.9[a]	—	94[d]	123[d]	214[d]	337[d]
All	0.9[a]	0.9[a]	7.7[a]	23.8[a]	38.7[a]	41.1[a]	52.8[c]	35.2[a]	147.7[a]	—	2,800[d]	4,508[d]	10,272[d]	15,536[d]
World GDP	—	—	111[b]	128[b]	221[b]	491[b]	491[b]	722[b]	1,942[b]	4,733[b]	11,118[e]	12,455[e]	21,141[e]	25,110[e]
Sample GDP	—	—	16[f]	43[f]	76[f]	149[f]	182[f]	273[f]	671[f]	—	7,806[d]	9,705[d]	17,250[d]	21,956[d]
Sample size	—	—	4[f]	7[f]	7[f]	7[f]	7[f]	7[f]	7[f]	—	25[d]	25[d]	25[d]	25[d]
Assets/sample GDP	—	—	0.47	0.55	0.51	0.28	0.26	0.12	0.18	—	0.36	0.46	0.60	0.71
Assets/world GDP	—	—	0.07	0.19	0.18	0.08	0.11	0.05	0.06	—	0.25	0.36	0.49	0.62
United Kingdom/all	0.56	0.78	0.64	0.51	0.50	0.44	0.43	0.40	0.21	—	0.20	0.19	0.17	0.16
United States/all	0.00	0.00	0.00	0.02	0.06	0.36	0.22	0.43	0.51	—	0.28	0.29	0.21	0.22
Liabilities														
Europe	—	—	—	5.4[a]	12.0[a]	—	10.3[a]	—	7.6[a]	—	1,457[d]	2,248[d]	5,405[d]	8,592[d]
North America	—	—	—	2.6[a]	11.1[a]	—	13.7[a]	—	12.5a	—	684[d]	1,412[d]	2,830[d]	4,681[d]
Australia and New Zealand	—	—	—	1.6[a]	2.0[a]	—	4.5[a]	—	2.2[a]	—	71[d]	118[d]	216[d]	318[d]
Japan	—	—	—	0.1[a]	1.0[a]	—	0.6[a]	—	0.3[a]	—	147[d]	307[d]	1,530[d]	1,970[d]
Latin America	—	—	—	2.9[g]	8.9[g]	—	11.3[g]	—	9.2[a]	57[g]	250[g]	—	505[g]	768[g]

(*continued*)

Table 3.2 (continued)

	1825	1855	1870	1900	1914	1930	1938	1945	1960	1971	1980	1985	1990	1995
Asia (exc. Japan)	—	—	—	2.4[g]	6.8[g]	—	10.6[g]	—	2.7[a]	29[g]	129[g]	—	524[g]	960[g]
Africa	—	—	—	3.0[g]	4.1[g]	—	4.0[g]	—	2.2[a]	19[g]	124[g]	—	306[g]	353[g]
Developing countries	—	—	—	6.0[g]	13.0[g]	—	25.9[g]	—	14.1[a]	107[g]	506[g]	—	1,338[g]	2,086[g]
All	—	—	—	18.0[a]	45.5[a]	—	55.0[a]	—	39.9[a]	—	3,368[e,f]	—	12,655[e,f]	19,728[e,f]
World GDP	—	—	111[b]	128[b]	221[b]	491[b]	491[b]	722[b]	1,942[b]	4,733[b]	11,118[e]	12,455[e]	21,141[e]	25,110[e]
Sample GDP	—	—	—	—	—	—	—	—	—	—	9,508[d]	—	19,294[d]	25,043[d]
Sample size	—	—	—	—	—	—	—	—	—	—	65[e,f]	—	65[e,f]	65[e,f]
Liabilities/sample GDP	—	—	—	—	—	—	—	—	—	—	0.35	—	0.66	0.79
Liabilities/world GDP	—	—	—	0.14	0.21	—	0.11	—	0.02	—	0.30	—	0.60	0.79
Developing countries/all	—	—	—	0.33	0.29	—	0.47	—	0.35	—	0.15	—	0.11	0.11

Note: Units for foreign investment and GDP are billions of current U.S. dollars.

[a]From Woodruff (1967, 150–59).

[b]From Lewis (1945, 292–97).

[c]From Maddison (1995); sample of 199 countries; 1990 U.S. dollars converted to current dollars using U.S. GDP deflator; some interpolation.

[d]Excludes "Other Europe" and "Other"; GDP data from Mitchell (1992, 1993, 1995), Maddison (1995, 2001), and unpublished data from Michael Bordo.

[e]From Twomey (1998; unpublished worksheets).

[f]From IMF (1997). Up to twenty-six countries, fixed sample, trend interpolation on missing data.

[g]From World Bank (1994).

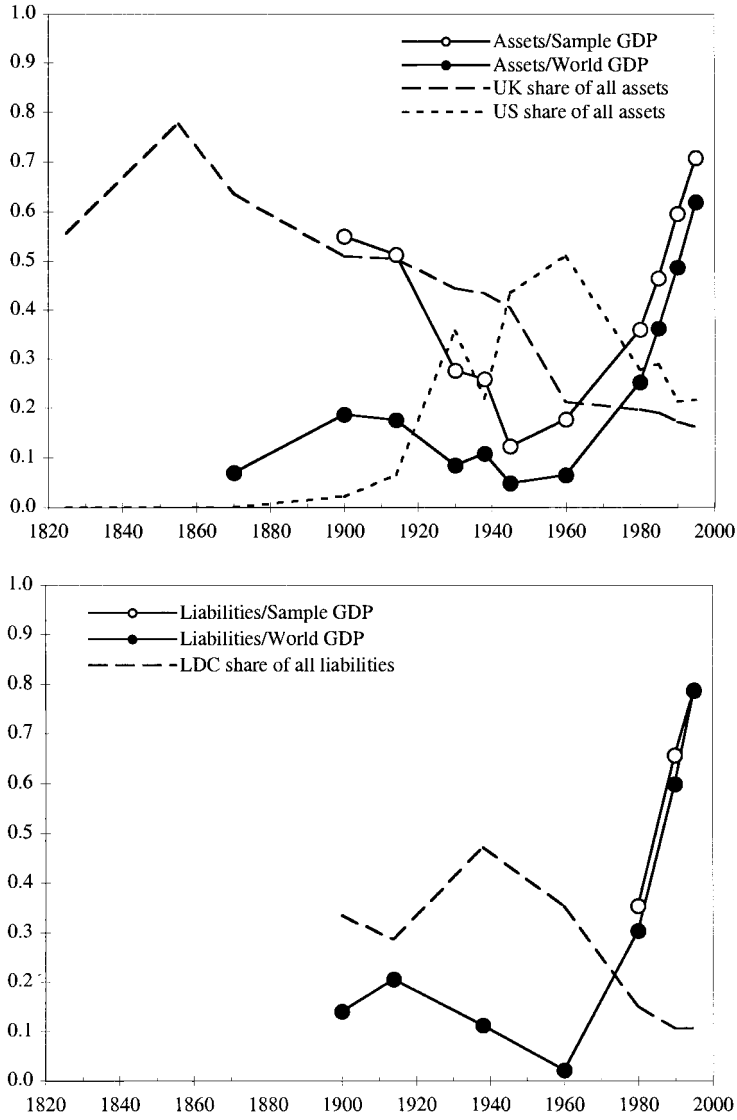

Fig. 3.3 Foreign capital stocks
Source: Table 3.2.

and New York's pivotal role as a financial center. After 1945, however, the United States decisively surpassed Great Britain as the major international asset holder, a position that has never since been challenged.[32]

32. Of course, this is the gross foreign investment position, not the net position. The United States is also now the world's number-one debtor nation, in both gross and net terms, having become a net debtor for the first time since the First World War in the late 1980s.

How big were nineteenth century holdings of foreign assets? In 1870 we estimate that foreign assets were just 7 percent of world gross domestic product (GDP), but this figure rose quickly, to just below 20 percent in the years 1900–14 at the zenith of the classical gold standard. During the interwar period, the collapse was swift, and foreign assets were only 8 percent of world output by 1930, 11 percent in 1938, and just 5 percent in 1945. Since this low point, the ratio has climbed, to 6 percent in 1960, 25 percent in 1980, and then climbing dramatically to 62 percent in 1995. Thus, the 1900–14 ratio of foreign investment to output in the world economy was not equaled again until 1980, but has now been approximately tripled.

An alternative measure recognizes the incompleteness of the data sources: For many countries we have no information on foreign investments at all, so a zero has been placed in the numerator, although that country's output has been included in the denominator as part of the world GDP estimate. This is an unfortunate aspect of our estimation procedure, and makes the above ratio likely an underestimate, or lower bound, for the true ratio of foreign assets to output. One way to correct this is to include in the denominator only the countries for which we actually have data on foreign investment in the numerator.[33] This procedure yields an estimate we term the ratio of foreign assets to sample GDP. This is likely an overestimate, or upper bound, for the true ratio, largely because in historical data, if not in contemporary sources, attention in the collection of foreign investment data has usually focused on the principal players, that is, the countries that have significant foreign asset holdings.[34]

Given all these concerns, does the ratio to sample GDP evolve in a very different way? No, but the recent upswing is not as pronounced using this alternative measure. The two ratios are very close after 1980. But before 1945 they are quite far apart: From 1870 to 1914, the sample of seven countries has a foreign asset to GDP ratio of over 50 percent, far above the world figure of 7 to 20 percent. By this measure we only surpassed the 1914 ratio as recently as 1990, and narrowly even then.

Clearly, these seven major creditors were exceptionally internationally diversified in the late nineteenth century in a way that no group of countries is today. By this reckoning, in countries like today's United States, we still have yet to see a return to the extremely high degree of international port-

33. That sample of countries is much less than the entire world, as we have noted. Until 1960, it includes only the seven major creditor countries noted in table 3.2; after 1980, we rely on the IMF sample from which we can identify up to thirty countries with foreign investment and GDP data.

34. That is, we are probably restricted in these samples to countries with individually high ratios of foreign assets to GDP. For example, in the rest of Europe circa 1914, we would be unlikely to find countries with portfolios as diversified internationally as those of the British, French, Germans, and Dutch. If we included those other countries it would probably bring our estimated ratio down. However, in the 1980s and 1990s IMF data, the problem is much less severe since we observe many more countries, and both large and small asset holders.

folio diversification seen in, say, Great Britain in the 1900–14 period, a historical finding that places in historical perspective the ongoing international diversification puzzle.[35]

Is the picture similar for liabilities as well as assets? Essentially, yes. The data are much more fragmentary here, with none in the nineteenth century, when the information for the key creditor nations was perhaps simpler to collect than data for a multitude of debtors. Even so, we have some estimates running from 1900 to the present at a few key dates. The ratio of liabilities to world GDP follows a path very much like that of the asset ratio, which is reassuring: They are each approximations built from different data sources at certain time points, although, in principle, they should be equal. Again, the ratio reaches a local maximum in 1914 of 21 percent, collapsing in the interwar period to 11 percent in 1938, and just 2 percent in 1960. By 1980 it had exceeded the 1914 level and stood at 30 percent. By 1995, the ratio was 79 percent.

To summarize, data on gross international asset positions seem broadly consistent with the idea of a U shape in the evolution of international capital mobility since the late nineteenth century, although it is less clear how we should compare the degree of diversification attained by some countries then with today's apparently significant, albeit declining, home bias in foreign asset holdings. Figuring whether too much or too little diversification existed at any point must remain conjectural, and conclusions would hinge on a calibrated and estimated portfolio model applied historically. This is certainly an object for future research. However, unless the global economy has dramatically changed in terms of the risk-return profile of assets and their global distribution, we have no prior reason to expect the efficient degree of diversification to have changed. For the present we can just say that, unless such a massive change did occur in the 1914–45 period, and unless it was then promptly reversed in the 1945–90 period, we cannot explain the time path of foreign capital stocks seen in table 3.2 and figure 3.3 except as a result of a dramatic decline in capital mobility in the interwar period, and a very slow recovery of capital mobility thereafter.

There is another important dimension of international asset stock data that we have not yet discussed: the evolution of net stocks, that is, the behavior of longer term development flows, as distinct from diversification flows. The literature on the Feldstein-Horioka (1980) paradox alerts us to the possibility that gross flows are orders of magnitude above net flows. We postpone discussion of that issue until later.

3.2.2 Real Interest Rate Convergence

A fundamental property of fully integrated international capital markets is that investors are indifferent on the margin between any two activities to

35. On the international diversification puzzle see Lewis (1999).

which they allocate capital, regardless of national location. International real interest rate equality would hold in the long run in a world where capital moves freely across borders and technological diffusion tends to drive a convergence process for national production possibilities.[36]

One basic indication of internationally integrated financial markets therefore would be the statistical stationarity of long-term real interest differentials. We investigate this property using long-term real interest rate data constructed from the Global Financial Data database. For a nominal interest rate i_t we use the monthly series on long-term government bond yields, which applies to bonds of maturities of seven years or longer. For inflation $\pi_t = (P_{t+12} - P_t)/P_t$ we use the ex post twelve-month forward rate of change of the consumer price index. The ex post real interest rate is then calculated as $r_t = i_t - \pi_t$, and for now we make the standard assumption that this is equal to the ex ante real rate plus a white-noise stationary forecast error. We focus on real long-term bond yields because these are most directly related to financing costs for capital investments, and hence to the expected marginal yield on investment. It is the latter variable we would like to be able to measure directly in order to evaluate the international mobility of capital.[37]

We consider three countries in our sample, relative to the United States as a base country. They are Great Britain, France, and Germany. We should note that the series are as consistent as they can be given the changing types of domestic bonds issued by the various countries over the last century, although maturities do change at several points for some countries. There are a few exceptions, such as the British consol, which has a continuous time series. We also note that prior to 1914 most countries have only annual price indices, meaning that our derived inflation series will also consist of annual observations, the exceptions being the United States and Great Britain. For the other two countries, we construct monthly series of ex post real interest rates by matching monthly nominal interest rates within a year t with the realized inflation rate between years $t + 1$ and t. Of course, in measuring long-term real interest rates, we would like to proxy long-term inflation expectations, but that cannot be done reliably. Thus we follow earlier empirical studies in utilizing a relatively short-horizon inflation measure notwithstanding the longer term of the corresponding nominal interest rates.

The real interest rate differential for three countries is shown in figure 3.4. This differential is calculated as $\tilde{r}_t = r_t - r_{\mathrm{US},t}$. This is the first time real inter-

36. We focus on long-term real interest rates here because these rates are most closely linked to the cost of long-lived capital, because the slow mean reversion in real exchange rates makes it difficult to discern expected exchange rate changes in short-term data, and because risk premia can be reduced over long horizons if long-run purchasing power parity holds.

37. For recent data, there is substantial evidence that international real interest rate differentials on short-term bonds are I(0); see, for example, Meese and Rogoff (1988) and Edison and Melick (1999).

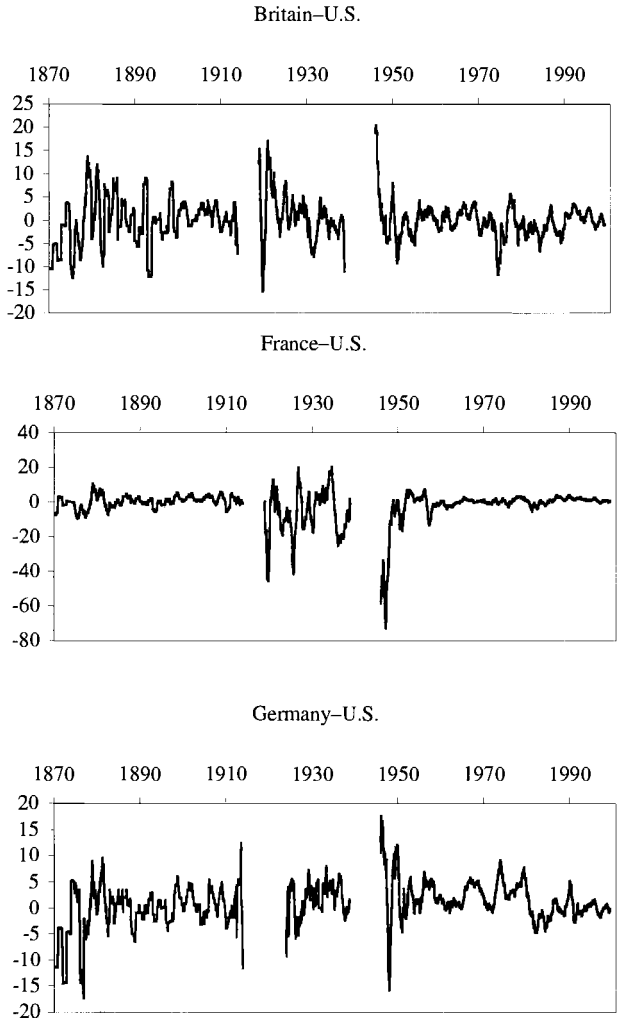

Fig. 3.4 Long-term real interest differentials

Notes: See text. The differential is calculated relative to the United States as $\tilde{r}_t = r_t - r_{US,t}$.

est rates over more than a century have been analyzed for this set of countries at such high frequency, so it is of interest to start by evaluating some general features of the data. The most striking impression conveyed by the figure is that differentials have varied widely over time, but have stayed relatively close to a zero mean. That is, the series appears to have been stationary over the very long run, and even in shorter subperiods.

The figures also reveal some of the changing coherence of real interest

rates in the subperiods. To avoid noisy data from nonmarket periods, the wartime years (1914–18, 1939–45) have been omitted, as has the German hyperinflation period (1919–23). Again we can focus on the four different subperiods that correspond to the four different monetary regimes: the gold standard (1890–1914), the interwar period (1921–38), Bretton Woods and the brief transitional period prior to generalized floating (1951–73), and the float (1974–2000).[38]

Allowing for the annual inflation data used before 1914, we can see that real interest differentials became somewhat more volatile in the interwar period, with a larger variance (this is less obvious in the German case because the hyperinflation period has been omitted). There is a decline in this volatility after 1950, and perhaps very little change between the pre-1974 period and the float. The latter observation may seem surprising, except that it is consistent with observations that, aside from nominal and real exchange rate volatility, there is little difference in the behavior of macro fundamentals between fixed and floating rate regimes, at least for developed countries (e.g., Baxter and Stockman 1989).

With no real interest rate divergence apparent, these figures provide prima facie evidence that real interest rates in developed countries have been cointegrated over time, where the differentials between countries appear stationary. A formal test of this hypothesis appears in table 3.3, where we apply two stationarity tests to the data for the period as a whole, as well as in various subperiods. The first test is the traditional augmented Dickey-Fuller (ADF) unit root test, and the second is the Dickey-Fuller generalized least squares (DFGLSu) test, one of a family of enhanced point-optimal and asymptotically efficient unit root tests recently proposed.[39] This table also reports a broader set of tests for the recent float, for an expanded sample including the Group of Seven (G7) plus the Netherlands, for comparison with the contemporary literature.

Where the null is rejected at the 1 percent level, the results show conclusively that the real interest differential has no unit root over the long run. Changes in the variances of series over time, of the kind evident in the preceding figures, may distort unit root tests (Hamori and Tokihisa 1997). However, the hypothesis of a unit root can be rejected in almost all cases at the 1 percent level in all periods except for the recent float. With respect to the recent float, the evidence against a unit root is stronger over the second

38. For the purpose of the present empirical analysis we begin our floating-rate period in early 1974 to be consistent with other empirical literature on the real interest rate–real exchange rate nexus. However, most historians would place the end of the Bretton Woods system in August 1971, the month the U.S. official gold window was shut.

39. See Elliott, Rothenberg, and Stock (1996) and Elliott (1999). We use the DFGLSu test from the latter, which allows for the initial observation to be drawn from the unconditional mean of the series. The RATS code for this procedure is available online at [http://www.estima.com].

Table 3.3 **Stationarity Tests: Long-Term Real Interest Differentials**

	Starting Date	Ending Date	ADF	DFGLSu
		A. Historical epochs		
Great Britain	1890:1	2000:7	–4.30***	–5.54***
France	1890:1	2000:7	–6.05***	–6.36***
Germany	1890:1	2000:7	–4.64***	–5.14***
Great Britain	1890:1	1913:12	–1.38	–3.44***
France	1890:1	1913:12	–3.18**	–4.36***
Germany	1890:1	1913:12	–3.86***	–3.70***
Great Britain	1921:1	1938:12	–3.59***	–4.01***
France	1921:1	1938:12	–2.39	–4.31***
Germany	1921:1	1938:12	–2.42	–2.84**
Great Britain	1951:1	1973:2	–5.09***	–5.37***
France	1951:1	1973:2	–3.81***	–3.34***
Germany	1951:1	1973:2	–3.32**	–3.51***
		B. Recent float		
Great Britain	1974:2	2000:8	–2.42	–3.75***
The Netherlands	1974:2	2000:8	–2.75*	–2.57*
France	1974:2	2000:8	–2.70*	–2.52*
Germany	1974:2	2000:8	–2.82*	–2.73*
Italy	1974:2	2000:8	–2.52	–2.87**
Japan	1974:2	2000:8	–2.20	–2.52*
Canada	1974:2	2000:8	–3.71***	–3.15**
Great Britain	1974:2	1986:3	–2.61*	–2.82**
The Netherlands	1974:2	1986:3	–1.28	–1.19
France	1974:2	1986:3	–2.21	–1.77
Germany	1974:2	1986:3	–1.77	–1.64
Italy	1974:2	1986:3	–2.56	–2.89**
Japan	1974:2	1986:3	–1.50	–1.72
Canada	1974:2	1986:3	–1.92	–1.93
Great Britain	1986:4	2000:7	–2.01	–2.62*
The Netherlands	1986:4	2000:7	–2.61*	–2.37
France	1986:4	2000:7	–2.25	–2.50*
Germany	1986:4	2000:7	–3.34**	–2.83**
Italy	1986:4	2000:7	–2.54	–2.55*
Japan	1986:4	2000:7	–2.43	–2.55*
Canada	1986:4	2000:7	–0.86	–2.28

Notes: See text. ADF is the augmented Dickey Fuller *t*-statistic; DFGLSu is the Dickey-Fuller generalized least-squares test (the test of Elliott 1999). The critical values are, respectively, (–3.43, –2.86, –2.57) for the ADF test, and (–3.28, –2.73, –2.46) for the DFGLSu test. Lag selection was via the Lagrange multiplier criterion with a maximum of twelve lags.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

subperiod (1986–2000) than over the first (1974–86). The above findings refer to the more powerful DFGLSu test, which rejects the null more frequently than the standard ADF test.

This indication of a stationary long-term real interest differential, especially insofar as it applies to the recent period of floating industrial-country exchange rates, contradicts much of the empirical literature produced through the mid-1990s. Why do we find more evidence of stationarity than earlier researchers, such as Meese and Rogoff (1988) and Edison and Pauls (1993)? We note that previous authors had shorter samples and used tests of relatively low power, such as the ADF test.

Indeed, our data and methods are consistent with earlier findings: If we switch to the Meese-Rogoff sample of February 1974 to March 1986, and use the ADF test as they did, then we replicate their conclusions exactly (as shown in the penultimate panel of the table). Even if we switch to the DFGLSu test on the same data, we can reject the null in only two out of seven cases. The results for the post-1986 sample show similar problems, even though for the post-1974 period as a whole we can always reject the null[40] at the 10 percent level or higher.

These findings, which are supportive of stationarity in recent long-term real interest differentials, are consistent with another strand in the literature that finds support for international real interest rate equalization at longer horizons (Fujii and Chinn 2000). We conclude that earlier analyses of recent data were hampered by the low power of unit root tests on samples of small span.[41]

3.2.3 Exchange-risk-free Nominal Interest Parity

Perhaps the most unambiguous indicator of capital mobility is the relationship between interest rates on identical assets located in different finan-

40. Edison and Melick (1999, 97) find mixed results on the stationarity of Canadian, German, and Japanese long-term real interest differentials against the United States, but nonetheless base their econometric analysis of real interest parity on the assumption that all real interest differentials are stationary.

41. A more stringent test would examine the validity of long-term real interest parity. A focus on long-term real rather than nominal interest rate parity seems preferable because with mean reverting real exchange rates, it is easier to proxy long-run expected real exchange rates than the corresponding nominal exchange rates. Meese and Rogoff (1988) rejected a version of real interest parity based on the maintained assumption of an underlying sticky-price exchange rate model. More supportive is the recent long-run panel cointegration study by MacDonald and Nagayasu (2000) of fourteen OECD countries relative to the United States. The statistical methodology of that work, however, assumes that long-term real interest differentials are nonstationary. Chortareas and Driver (2001) implement a similar approach using a seventeen-country panel of OECD countries versus the United States; their conclusions are similar to those of MacDonald and Nagayasu. Chortareas and Driver report mixed results for tests on the stationarity of long-term real interest differentials. One issue pervading all of the work in this area is the effect of alternative proxies for long-term inflation expectations. The proxies that are chosen often differ across authors, affecting some results. A systematic discussion of these differences lies beyond the scope of this paper.

cial centers.[42,43] The great advantage of comparing onshore and offshore interest rates such as these is that relative rates of return are not affected by pure currency risk. For much of the period we study here, a direct onshore-offshore comparison is impossible. However, the existence of forward exchange instruments allows us to construct roughly equivalent measures of the return to currency-risk-free international arbitrage operations.

Using monthly data on forward exchange rates, spot rates, and nominal interest rates for 1921 to the latter half of 2001, we assess the degree of international financial-market integration by calculating the return to covered interest arbitrage between financial centers. For example, a London resident could earn the gross sterling interest rate $1 + i_t^*$ on a London loan of one pound sterling. Alternatively, he or she could invest the same currency unit in New York, simultaneously covering the exchange risk by selling dollars forward. The investor would do this in three steps: Buy e_t dollars in the spot exchange market (where e_t is the spot price of sterling in dollar terms); next, invest the proceeds for a total of $e_t(1 + i_t)$, where i_t is the nominal dollar interest rate; and finally, sell that sum of dollars forward for $e_t(1 + i_t)/f_t$ in sterling (where f_t, the forward exchange rate, is the price of forward sterling in terms of forward dollars). The net gain from borrowing in London and investing in New York,

$$\frac{e_t}{f_t}(1 + i_t) - (1 + i_i^*), \tag{3}$$

is zero when capital mobility is perfect and the interest rates and forward rate are free of default risk. The left-hand side of the preceding expression represents a price of present pounds sterling in terms of future pounds sterling (i.e., of pounds dated t in terms of pounds dated $t + 1$), but it can be viewed as the relative price prevailing in the New York market, that is, as a kind of offshore interest rate. Thus, our test, in effect, examines the equality of the onshore sterling interest rate i^* with the offshore New York rate so defined. We perform a similar calculation for German mark interest differentials between London (considered as the offshore center) and Germany (onshore), thereby gauging the difference between implicit mark interest rates in London and the rates prevailing near the same time in Germany.

For pre-1920 data, we examine a related but distinct measure based on current New York prices of sterling for (two-months) future delivery, as in Obstfeld and Taylor (1998). The parallel Germany-London arbitrage calculation before 1920, corresponding to the preceding New York-London

42. See the discussion in Obstfeld (1995), for example.

43. This section draws heavily on Obstfeld and Taylor (1998) for the case of Great Britain, but adds new data on Germany for comparison. After our 1998 paper was published, we became aware of a similar 1889–1909 U.S.-U.K. interest rate comparison contained in Calomiris and Hubbard (1996).

comparison, is based on London prices for German marks to be delivered three months in the future. Forward exchange contracts of the kind common after 1920 were not prevalent before then (except in some exceptional financial centers; see Einzig 1937), so we instead base our pre-1920 comparison of onshore and offshore interest rates on the most widely traded instrument, one for which prices were regularly quoted in the major financial centers' markets, the long bill of exchange. Long bills could be used to cover the exchange risk that might otherwise be involved in interest-rate arbitrage.[44]

To see how such a transaction would work, let b_t denote the date-t dollar price in New York of £1 deliverable in London after sixty days, and e_t the spot New York price of sterling.[45] One way to purchase a future pound deliverable in London would be through a straight sterling loan, at price $1/(1 + i_t^*)$, where i_t^* is the London sixty-day discount rate. An alternative would be to purchase in New York a bill on London, at a price in terms of current sterling of b_t/e_t. With perfect and costless international arbitrage, these two prices of £1 to be delivered in London in the future should be the same.

Perkins (1978) observed that the series $(e/b) - 1$ defines the sterling interest rate in American financial markets, that is, the offshore sterling rate in the United States. This series may be compared with the London rate i^*, as we did in our 1998 paper, to gauge the degree of cross-border financial integration; that is, we calculate the differential

$$\frac{e_t}{b_t} - (1 + i_t^*)$$

before 1920.

Perkins's (1978) primary aim was to modify earlier series of dollar-sterling spot rates derived by Davis and Hughes (1960), who applied U.S. rather than U.K. interest rates to the dollar prices of long sterling bills in order to infer a series of sight exchange rates. Perkins argued that the sight bill rate should be derived by multiplying the (lower) long bill rate by a sterling, not a dollar, interest factor, and subsequent scholars have followed him; see, for example, the judgment of Officer (1996, 69). From a theoretical point of view, the verdict is clear: The relative price of current and future sterling defines a sterling nominal interest rate, in the present case, the offshore New York rate that we compare to London rates.

The upper panel of figure 3.5 is based on monthly differences between sterling rates in New York and in London from 1870 to 2001, where we simply splice together the 1870–1919 numbers based on time bill rates with

44. Margraff (1908, 37) speaks explicitly of the need to cover interest arbitrage through the exchange market.

45. In fact, such bills were payable after sixty-three days due to a legal grace period of three days, an institutional fact we account for in the calculations below (Haupt 1894, 429).

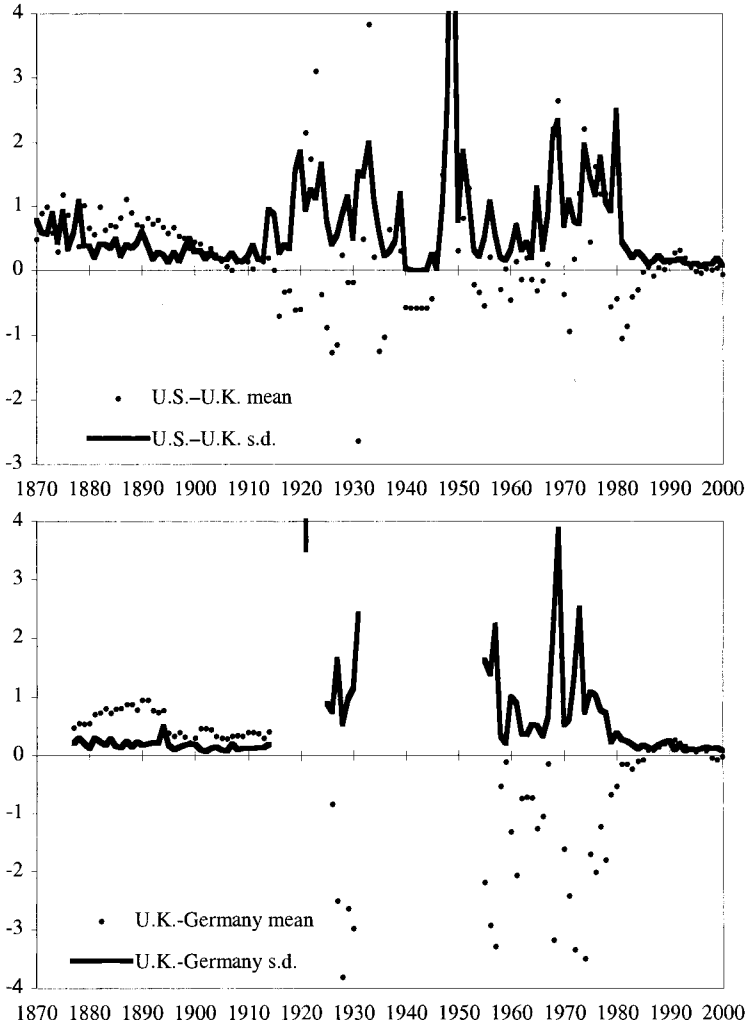

Fig. 3.5 Exchange-risk-free nominal interest differentials since 1870: *A*, U.S.-U.K.; *B*, U.K.-Germany

Sources: See text.

Notes: Annual samples of monthly data, percent per annum.

the subsequently available covered interest differentials. Differential returns are calculated as annual rates of accrual.[46]

46. The U.S.-U.K. comparison is based on the data described in Obstfeld and Taylor (1998, 361n. 7), with the following amendments. From January 1975 to August 2001, the London sterling interest rate i is the three-month bank bill middle rate, from Datastream. From January 1981 to August 2001, the New York dollar interest rate i is the discount rate on ninety-day bankers' acceptances, from Datastream. Finally, from January 1981 to August 2001 spot and

The figure broadly supports other indicators of the evolution of capital mobility. Differentials are relatively small and steady under the pre-1914 gold standard, but start to open up during World War I. They stay quite large in the early 1920s. Differentials diminish briefly in the late 1920s, but widen sharply in the early 1930s. There are some big arbitrage gaps in the late 1940s through the mid-1950s—including a sharp spike in volatility at the time of the 1956 Suez crisis.[47] But these shrink starting in the late 1950s and early 1960s, only to open up again in the late 1960s as sterling's 1967 devaluation initiates a period of foreign exchange turmoil, culminating in the unraveling of the Bretton Woods system in the early 1970s. Interest differentials have become small once again since the disappearance of U.K. capital controls around 1980. The differentials appear even smaller now than before 1914.[48]

Indeed, for the 1870–1914 data we observe a tendency, quite systematic albeit declining over time, for New York sterling rates to exceed London

three-month forward dollar-sterling exchange rates come from Datastream. All of these new data are end-of-month observations.

For the U.K.-German comparison, data are monthly averages up until January 1981 and end of month thereafter, as follows. *Exchange rates*: From October 1877 to July 1914 we use the month-average spot Mark-sterling exchange rate from the National Bureau of Economic Research (NBER) macrohistory database, series 14106. London sterling prices for three-month bills on Berlin are "money" rates taken from the "Course of Exchange" table in *The Economist*. From January 1921 to September 1931 we average the weekly spot and three-month forward exchange rates listed by Einzig (1937). From May 1955 to December 1980, spot exchange rates are from *The Economist* through 1957 and thereafter from Datastream. Forward exchange rates are from the London *Times* (May 1955–October 1958), from *The Economist* subsequently through 1964, then from the London *Times* through 1975, and, finally, starting January 1976, from Datastream. *U.K. three-month interest rate*: Open market three-month discount rate, NBER series 13016, through September 1931. Data from 1955 to 1974 come from the Federal Reserve banking database (and are similar to the well-known Capie-Webber series). Starting in January 1975 we use the U.K. interbank (money market) three-month middle rate of interest. *German three-month interest rate*: From October 1877 through September 1931, where observations are available, we use the Berlin private open market discount rate for prime bankers' acceptances given as NBER series 13018. The German three-month money market rate for 1955–59 is an average of monthly high and low rates taken from *Monthly Report of the Deutsche Bundesbank* and thereafter, through end-1980, comes from the IMF's *International Financial Statistics*. Subsequent data are from Datastream, the three-month "dead middle" money market rate.

47. See Klug and Smith (1999) for a fascinating empirical study of the Suez crisis. The paper includes a discussion of daily covered arbitrage differentials from 1 June 1956 to 31 January 1957.

48. We alert the reader to several potential problems with our calculations and data. First, as we have already stressed above and indeed stressed quite clearly in Obstfeld and Taylor (1998), the two measures of market integration that we calculate refer to different arbitrage possibilities before and after 1920. Second, some forward transactions appear at different maturities in our data set. Third, most data are observed at or near end-of-month, but some data are averages of weekly numbers. Averaging has the effect of dampening measured volatility. Fourth, data from World War II reflect rigidly administered prices and have no capital mobility implications. Fifth, the data used are not closely aligned for time of day (and even differ as to day in some cases), so that some deviations from parity may be exaggerated. The purpose of the exercise, however, is merely to convey a broad sense of the trend in integration, not to pursue a detailed hunt for small arbitrage possibilities.

rates. In arguing in favor of a sterling discount rate for valuing long sterling bills traded in the United States, Perkins (1978) demonstrated a tendency for the implicit offshore sterling interest rate $(e/b) - 1$ to converge toward bank rate toward the end of the nineteenth century (see his fig. 2, p. 399). Our figure 3.5, however, compares the New York offshore sterling interest rate with the London money-market rate of discount, which tended to be somewhat below bank rate. Were we to use bank rate as the London interest rate in the figure, much of the pre-1914 gap would be eliminated. Given that the U.S. data consist of prices of high-quality paper (such as bank bills), however, comparisons with bank rate are probably inappropriate. As Spalding (1915, 49) observes: "Bank Rate, as is well known, is usually higher than market rate; therefore if ordinary trade bills are remitted [to London] from [abroad], to find the long exchange, interest will be calculated at our Bank Rate, as trade paper is not considered such a good security as bank bills."[49] Officer (1996, 69) concurs, although on different grounds: "Whereas the Bank Rate was set by the Bank of England, the money-market rate was a true competitive price. . . . The money-market rate of discount is the better measure."

If it is impermissible to compare the sterling interest rate in New York with bank rate in London, how, then, can we explain the systematic positive interest gap in favor of New York before 1914? Much if not all of the gap can be explained as an artifact of the procedure we have used to extract the offshore interest rate from the observations on sight and time bill prices.

Continuing our focus on the New York–London comparison of sterling interest rates, we notice that the published money-market discount rate for London is quoted as a "pure" relative price of future in terms of present sterling. In contrast, as practitioners' textbooks of the period make amply clear, in determining the price to be paid for a long bill of exchange on London, purchasers would factor in not only the spot exchange rate and the London market discount rate, but, in addition, commissions, profit margins, and, importantly, the stamp duty (0.05 percent of the bill's face value) payable to the British government. These factors made bill prices lower than they would have been if they simply were equal to the spot exchange rate discounted by the pure New York sterling rate of interest.

Margraff (1908, 121) estimates that for a ninety-day bill, the total of such factors amounted to 0.125 percent of face value. For a sixty-day bill, that charge would represent about 75 basis points in annualized form; Escher (1918, 81–82), published a decade later, cites a very slightly smaller number. By subtracting that "tax" from the pre-1914 differentials plotted in the top of figure 3.5, we see that the apparent average excess return in New York disappears.

Indeed, the average return becomes negative for 1890–1914, so that 75

49. See also the summary table in Margraff (1908, 112).

basis points in additional costs may well be an overestimate for the entire prewar period. Suggestive of declining costs is the tendency shown in the figure for the average bias to decline over time. Perkins (1978, 400–01) argues that U.S. foreign exchange dealers of the period were able to exploit market power to inflate their commissions. Certainly such market power declined through 1914 as markets evolved, and Officer's (1996, 75) data on brokers' commissions supports this view.[50] Of course, a process of market integration increases competition and drives commissions down. Thus, leaving aside the portion due to the stamp tax, the size of the New York–London discrepancy is to some degree a reflection of financial market segmentation and its secular decline evidence of a process of progressive integration.

The lower panel of figure 3.5 shows the difference between the implicit mark interest rate in London and the one prevailing in Germany. Again, the U-shaped evolution of capital mobility is evident over our entire sample period. Before 1914, the former, offshore, rate is calculated on the basis of ninety-day prime bills of exchange on Berlin traded in London. The results are remarkably consistent with those for New York–London.

In particular, we again observe a systematic but secularly declining excess return in London prior to 1914. The explanation is essentially the same as in the New York–London comparison above. Germany levied a stamp duty on bills at the same rate as Britain's (0.05 percent; see Haupt 1894, 164, or Margraff 1908, 133). Margraff's estimates of concomitant costs suggest that for a ninety-day bill on Berlin, about 40 basis points should be subtracted from the annualized sight bill premium $4 \times ([e/b] - 1)$ to ascertain the true London mark rate of interest. On the assumption that some costs decline over time, with 40 basis points an average for the prewar period as whole, that cost adjustment brings the offshore and onshore mark rates roughly into line.[51]

While the cost and tax considerations we have described potentially eliminate the pre-1914 upward bias in our estimated series of offshore interest rates, other financial transaction costs would, as usual, create no-arbitrage bands around the point of onshore-offshore interest rate equality. One way to evaluate the evolution of capital mobility through time would be to estimate over different eras what Einzig (1937, 25) calls "transfer points," that is, the minimum return differential necessary to induce arbitrage operations. Keynes and Einzig agreed that during the interwar period, at least a 50 basis point covered differential would be needed to induce arbitrage.

50. Country-risk-type arguments cannot easily rationalize the pre-1920 interest differential in favor of New York, as we pointed out earlier in Obstfeld and Taylor (1998, 361n. 6). The reason is that both of the two transactions we compare entail future payment in the same place, London. This is not the case in the post-1920 covered interest arbitrage calculations.

51. Flandreau and Rivière (1999) focus on a London-Paris comparison for 1900–14. Their results are entirely consistent with the data that we show in figure 3.5, including a systematic excess of the London franc interest rate over that in Paris. Their rationale for the differential is apparently different from ours, although they do not include details of their derivation.

That is, they suggested a no-arbitrage band of ±50 basis points. Applying nonlinear estimation techniques including a threshold autoregression (TAR) methodology to weekly interwar data on dollar-sterling covered return differentials, Peel and Taylor (2002) confirm that a no-arbitrage band close to ±50 basis points did appear to prevail, as Keynes and Einzig claimed. Only outside this range did arbitrage forces push spot and forward exchange rates toward conformity with the band.

A detailed investigation is beyond the scope of this paper, but a first pass at the data using the TAR methodology of Obstfeld and Taylor (1997) is suggestive. For the dollar-sterling exchange between June 1925 and June 1931, we calculate a band of inaction of ±60 basis points, very close to the Peel-Taylor estimate given that we are using coarser, monthly data. For the corresponding interwar sterling-mark exchange our estimated band is ±91 basis points wide. On 1880–1914 differentials, in contrast, we find (after subtracting a constant mean differential) bands of only ±19 basis points for New York–London and ±35 basis points for London-Berlin. By way of comparison, Clinton (1988) suggests that covered interest differentials in the mid-1980s needed to reach just ±6 basis points to become economically significant. Balke and Wohar (1998) produce an estimate 50 percent higher for the 1974–93 period. We suspect that a more careful analysis of pre-1914 differentials, one taking account of the upward trend in market integration, would reduce our estimated transaction cost bands for the early twentieth century. Accordingly, the degree of integration among core money markets achieved under the classical gold standard must be judged as truly impressive compared to conditions over the following half-century or more.

The Great Depression, perhaps as part of a much broader interwar phase of disintegration, therefore stands out as an event that transformed the world capital market and left interest arbitrage differentials higher and more volatile than ever before.

3.2.4 Equity Returns

It is interesting to ask whether the long-run evidence on the U shape of capital market integration extends to other criteria, and other markets such as equities. Over the long run, global equity markets have evolved at a very different rate than global bond markets, for example. Government bonds from core countries have generally traded in financial centers in the last 100 years, but for long spans of time, emerging-market debt was very difficult to place in the private sector, and most went through multilateral intermediaries. Similarly, international trade in equities, although quiescent in the middle of the century, grew substantially in core countries after the lifting of capital controls in the 1970s and 1980s, and by the 1990s several emerging equity markets were involved as well.

Does quantitative evidence exist to verify this narrative? Quantity data are harder to find at a disaggregated level. Breaking down foreign investment into its components is an enormous historical task, and few have at-

tempted it in the quest for long-run comparable series across many countries (but see Twomey 2000). We will not attempt to press further here. Instead, we will examine price evidence to see what changing patterns of equity returns might tell us about globalization.

There is certainly some debate about the indicators of equity returns in the long run and what they tell us about globalization. Jorion and Goetzmann (1999) find that most of the world's stock markets have exhibited fairly low real returns over the long run in the last century, around 1 percent, with the exception of the United States, which has yielded around 4 percent annually since 1921. These figures caution that U.S. exceptionalism might extend to stock market returns also, and cast doubt on the general, global truth of the equity premium puzzle. The authors also note that survivorship bias likely afflicts the United States and many other markets in the core countries for which data exist. In many emerging markets, stock prices have fluctuated wildly and many series break down at critical historical junctures and during wars, limiting our ability to compare like with like.

In this section we take a fresh look at long-run equity returns using data similar to those employed by Jorion and Goetzmann (1999), the Global Financial Data source. We ask two questions not addressed by previous authors: To what extent have stock returns (measured in a common currency, the U.S. dollar) diverged or converged over time, and to what extent have the time series correlations of returns across countries changed over time? We then consider what the answers may have to say about globalization.

Figure 3.6 shows summary statistics for a sample of up to twenty-two country stock price indices based on annual U.S. dollar-denominated returns since 1880.[52] The bottom chart indicates that the sample size diminishes markedly prior to 1950, evidence of the survivorship problem. We usually have twenty countries in the sample after that date, but in the interwar period the sample size is about a dozen, and before 1920 between five and ten. A wide line traces out the sample size for a limited set of core countries, the G7. For this group there is a more consistent sample size over time, although only three series before 1920.

The middle panel shows the standard deviation of returns across time, calculated for a centered moving window of ten-year length and encompassing the largest sample possible.[53] Again, the thin line is the full sample, the wide line the G7. As a description of the coherence of the returns in G7 equity markets this figure is strikingly consistent with the U-shape hypothesis and the underlying arbitrage arguments. Returns showed relatively little dispersion prior to 1914, but larger gaps opened up in the interwar period. This dispersion reached a peak around 1945 or 1950, but has been

52. Since dividend data are not available for the entire sample, the calculated returns are based on equity price changes only.

53. Specifically, we plot ten-year averages of the cross-sectional standard deviations of returns.

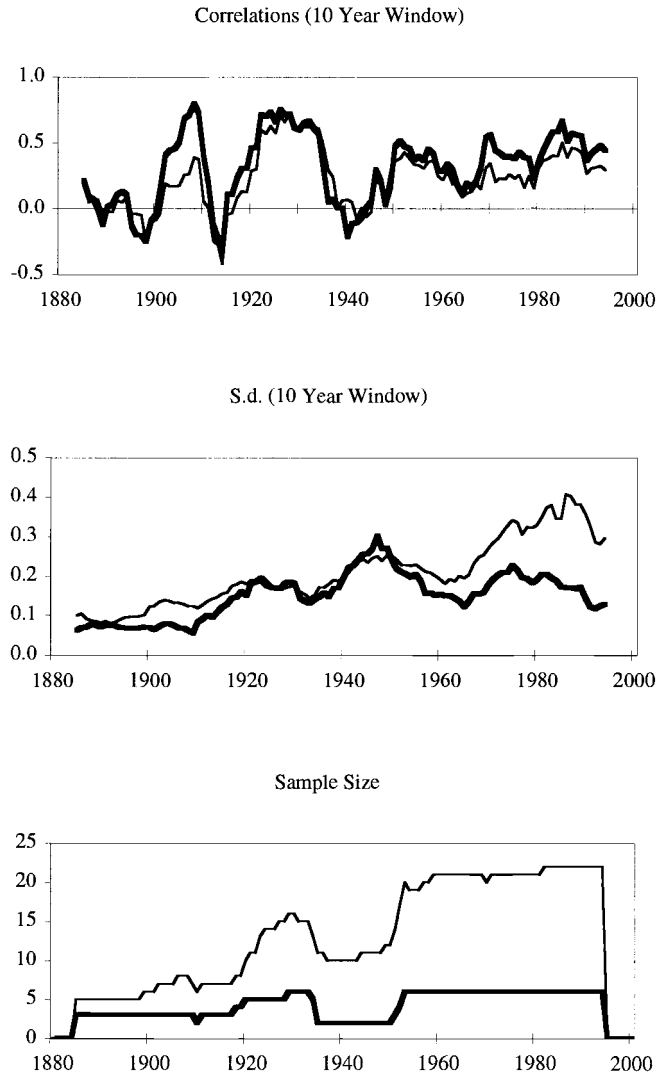

Fig. 3.6 Equity returns in U.S. dollars for the G7 and up to twenty-two global stock markets, 1880–2000
Source: Global Financial Data.

falling since, with a minor reversal in the late 1960s but convergence again after 1980, roughly when G7 capital controls loosened. The picture for the full sample is a little less clear, since the sample size is not consistent. We do not know how much of the long-run increase in dispersion, for example, is due to an increase in the sample size over time; for example, the addition in recent years of more volatile emerging markets might be expected to raise

the variance. But for the post-1950 period, when the sample is stable, the trends are quite similar to those in the G7, although the returns are much less coherent than for the G7 in the 1970s and 1980s, a period in which capital controls were much tighter in the periphery than in the core. It is also apparent that in the 1990s, the emerging markets have seen a much larger decline in dispersion, at a time when economic reforms generally reduced barriers to capital mobility, and emerging market portfolio investment grew rapidly.

Finally, the top panel explores a second measure of coherence of stock prices across countries, based on the average correlation of annual dollar returns with that on the U.S. market, again calculated for a centered moving window of ten-year length and encompassing the largest sample possible, and where the thin line is the average for the full sample and the wide line for the G7. The correlations show clear disconnects between markets during times of well-known autarky, such as the two world wars. Periods of high correlation also appear more recently and before 1914 (although only just before). Although the noisiness of the correlations is quite large, this much, at least, is consistent with the U-shape story. What is not consistent with the story is the large spike in cross-country correlations in the 1920s and 1930s. Why should this be so, in what was an era of supposedly fairly low capital mobility?

One answer has been provided already by Eichengreen and Sachs (1985, fig. 5), who show that the interwar patterns may simply reflect common shocks associated with going on and off the gold standard. To follow their example, consider the 1929 to 1935 period. Countries that stayed on gold like France and Germany did endured a brutal downturn in prices and output, whereas countries that devalued did not. This has been empirically verified for wider samples such as Latin America (Campa 1990). It is consistent with monetary explanations of recovery that build on both the debt-deflation logic of Fisher and the expected-real-interest-rate channel emphasized by Mundell, not to mention the conventional Keynesian transmission mechanism (Temin 1989; Romer 1992; Eichengreen 1992; Bernanke and Carey 1996).

What did this mean for stock markets? In a world of nonneutral money, devaluers would be able to drive up Tobin's q by restoring positive investment expectations. Eichengreen and Sachs (1985) found a statistically significant correlation between the change in q and the change in the exchange rate (relative to gold parity) in a sample of nine countries from 1929 to 1935. We replicate and extend their analysis in figure 3.7. This figure shows that the correlation holds true in a wider sample of eighteen countries.

These results imply that we must therefore be cautious about interpreting an increased correlation among markets as evidence of globalization per se. Instead, certain high correlations might simply be a result of common shocks among a group of countries, in this case countries experiencing, and

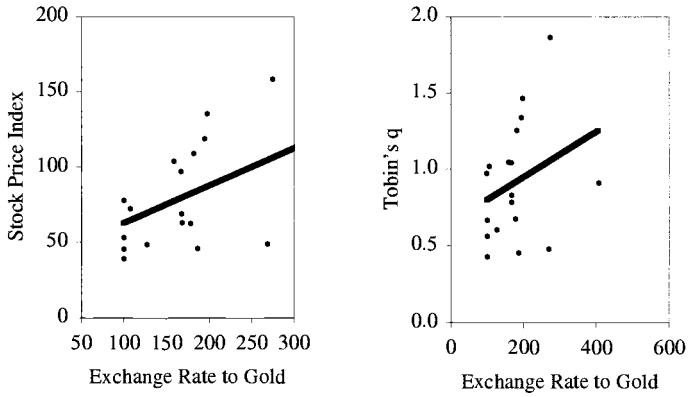

Fig. 3.7 Equity markets and the Great Depression, 1929–1935: *A*, 1935 stock price in index versus 1935 exchange rate to gold (1929 = 100); *B*, 1935 Tobin's *q* versus 1935 exchange rate to gold (1929 = 100)

Sources: Global Financial Data; Obstfeld and Taylor (2003).

then reacting to, the biggest single macroeconomic shock of the twentieth century. This caveat is well known. For example, a recent article in *The Economist* (Economics Focus, "Dancing in Step," 24 March 2001) reports that in the 1990s global stock market correlations have risen to even higher levels than in the late 1980s (as high as 0.8 in year 2000, although at what frequency is not mentioned).[54] This came after a decline in correlations in the early 1990s, but "the long term trend is upward." Overall, the article concludes, this is consistent with increased globalization pressures, but certain large shocks, like the recent crises in Asia, might also have also been associated with higher correlations via contagion channels. As the article notes, "stock markets tend to be more correlated at times of high volatility in share prices; during calmer periods, correlations tend to be weaker." Similar reasoning, of course, could pertain to the roaring twenties and the bust of the thirties.[55]

3.2.5 Summary

Many studies of market integration have focused on a single kind of criterion. This approach seems unreasonably restrictive to us, since the interpretation of such narrow criteria must necessarily rest upon untested auxiliary assumptions. By contrast, we see no reason to dismiss any useful information, in either price or quantity form, especially given the paucity of

54. On these correlations see also Gourinchas and Rey (2001) and IMF (2001, 76).

55. The definition of *contagion* is controversial: Contagion may entail a structural intensification of spillovers in crisis periods. As Forbes and Rigobon (2000) stress, however, higher return volatility itself can mechanically raise cross-border return correlations even in the absence of any underlying structural change, and it may be misleading to view this as a contagion effect.

historical data in certain quarters. Thus, we have opted for a broad battery of tests to try to cut down the possible set of explanations that could account for the empirical record, and so, by a process of elimination, work toward a set on controlled conjectures concerning the evolution of the global capital market.

The preceding section succinctly conveys the benefits we think this kind of approach can deliver. Our quantity-based tests delivered a certain set of stylized facts, and the price-based tests another set of facts. Combining the two, and introducing evidence on convergence and divergence in other economic phenomena such as living standards and demography, we claim there is overwhelming support for the notion that the major long-run changes in the degree of global capital mobility have taken the form of changes in the impediments to capital flows, rather than any encouragement or discouragement to flows arising from structural shifts within the economies themselves. That is not to discount the fact that such changes have occurred, and are no doubt important at the margin; but it is an assertion that the virtual disappearance of foreign capital flows and stocks in midcentury, and the explosion in price differentials, can be explained only by an appeal to changes in arbitrage possibilities as permitted by two major constraining factors in capital market operations: technology and national economic policies.

From this point, it is a short step to the conclusion that a full accounting of the phenomena at hand must rest on a detailed political and institutional history. Clearly, technology is a poor candidate for the explanation of the twentieth-century collapse of capital mobility. In the 1920s and 1930s, the prevailing financial technologies were not suddenly forgotten by market participants: Indeed some technologies, such as futures markets for foreign exchange, came to fruition in those decades. Technological evolution was not smooth and linear, but as we have already noted, was at least unidirectional, and, absent any other impediments, would have implied an uninterrupted progress toward an ever more tightly connected global marketplace.

Such was not allowed to happen, of course. Rather, the shifting forces of national economic policies, as influenced by the prevailing economic theories of the day, loomed large during and after the watershed event of the twentieth century, the economic and political crisis of the Great Depression. Understanding the macroeconomic and international economic history of the last century in these terms, and the changes it wrought for the operation of the global capital market, is a long and complex story, a narrative that properly accompanies the empirical record presented in this paper, and we take up some of the political economy dimensions of that story in the section that follows.

3.3 Political Economy

We have thus far amassed evidence that international capital mobility has experienced two major swings over the course of the twentieth century:

a pronounced decline during the interwar years and a recovery in the later postwar years. The timing is hard to pin down precisely, and, indeed, surely varied by country and by the type of capital movements being considered.

Taking this as given, we now must ask why capital mobility followed this path, and what corroborative evidence we can assemble to buttress an account of these events that incorporates the forces of political economy. We start first with the downturn in capital mobility after 1914.

3.3.1 The Downturn

The conventional macrohistorical account of the collapse of capital mobility after 1914 focuses on the trilemma, as we have noted, (Eichengreen 1996; Obstfeld and Taylor 1998). The literature suggests that the major political economy forces at work during this period were increasing pressure for macroeconomic activism, particularly from newly or better-enfranchised groups such as the working classes. If fixed exchange rates were to be maintained, then capital mobility would have to be compromised, at least on some occasions. Maintenance of capital mobility instead would preclude an exchange rate target. Either option would raise uncertainty for investors.

It is believed that prior to 1914, gold standard orthodoxy had been a sine qua non for access to global capital markets on favorable terms. A first study by Bordo and Rockoff (1996) found that adherence to gold standard rules acted as a "seal of approval" for sovereign debt. Gold standard countries had lower country risk, measured by the bond spread in London over the British consol.[56] Accordingly, evidence of a new political dynamic after 1914 might be seen in a changing relationship between country risk and gold after the gold standard was reconstituted starting in 1925. With the rules of the game in question after World War I, investors might have doubted whether the announcement of a gold standard commitment alone would signal credibility. In addition, public solvency indicators, such as debt-GDP ratios, or inflation, might be seen as having a bigger impact on international bond spreads under the reconstituted gold standard than before. Do such doubts manifest themselves in the data?

There is no uniform and comprehensive study of bond spreads across these two eras that would allow us definitively to answer this question, but a second study by Bordo, Edelstein, and Rockoff (1999) came to a conclusion that was surprising, even by the authors' own admission. Looking solely at 1920s bonds they found continued evidence that the gold standard remained a seal of approval, lowering bond spreads significantly, at least when a country stuck to its prewar parity. Devaluers were not so lucky with their bond spreads, since for them, the impact of being on gold was small

56. Clemens and Williamson (2000), however, find no statistically significant gold standard effect on the shares of British capital flows to various foreign recipients during 1870–1913. It remains to reconcile the apparently conflicting message of the price and quantity data.

and statistically insignificant. Such a conclusion challenged the conventional wisdom that the interwar gold standard was a pale and less credible shadow of its predecessor.

These are two pioneering studies but, for comparative work across regimes, they are not ideal. Unfortunately, they cannot be merged together into a consistent picture because of differences in the methods and data employed. The former study looked at long-term government bonds in the secondary market, and examined their yield to maturity; the latter examined new issues and their yield at the moment of flotation only. The former study therefore had complete time series, whereas the latter had a small sample that was often interrupted by missing data in years when no issues took place—a not uncommon event in the 1920s, and one that could raise a potential sample-selection issue. Finally, the former studied prices in London, the latter prices in New York, a switch that could be defended as the hegemonic center of global capital markets shifted across the Atlantic around this time, and one that allowed the use of Cleona Lewis' (1938) data on new issues for the 1920s.

To overcome the differences between these studies, we reexamine the question of what determined bond spreads in the pre-1914 and interwar years using a much larger database that allows us to view a consistent set of data for a larger sample of countries from 1870 to 1940. In the Global Financial Data source and other primary sources we found the yields to maturity of government bonds traded in London for this entire period, and we focus on more than twenty countries, some in the core and some in the periphery, to see how their country risk evolved. This allows us to focus on the same market and the same type of risk measure across both eras. To isolate the effects of default risk, our spreads over London are exclusively for bonds denominated in gold or in sterling.

Figure 3.8 offers an overview of the data. The mean bond spread for the core and periphery subsamples is presented in the top and bottom panels, respectively, and each is surrounded by a measure of dispersion, a band equal to ± 2 standard deviations. The units are percentage points and the scales are deliberately the same on the two charts.[57]

57. Country risk is calculated as the spread between the country's long bond, denominated in hard currency or gold (the external London bond), and the British consol. The core and empire countries are Australia, Canada, Denmark, Germany, India, New Zealand, Norway, South Africa, Sweden, and the United States. The periphery countries are Argentina, Austria (or Austria-Hungary, before World War I), Brazil, Chile, Egypt, Finland, Greece, Hungary (after World War I), India, Italy, Japan, Mexico, Portugal, Spain, Turkey, and Uruguay. There are occasional missing data, due to the fact that bonds are recorded by Global Financial Data (GFD) in domestic currency (paper) only or are not recorded at all. Notable gaps are Argentina (1935–40), Austria (1933–40), Chile (1934–40), Denmark (1870–1918), Finland (1870–1910), Greece (1927–40), Mexico (1933–40), Sweden (1933–40), Uruguay (1934–40), and several countries around the time of World War I (1914–18). We supplement the GFD source as follows: For Argentina we use improved data from della Paolera (1988) and Nakamura and Zarazaga (2003). For the United States (1870–1914) we follow Bordo and Rockoff

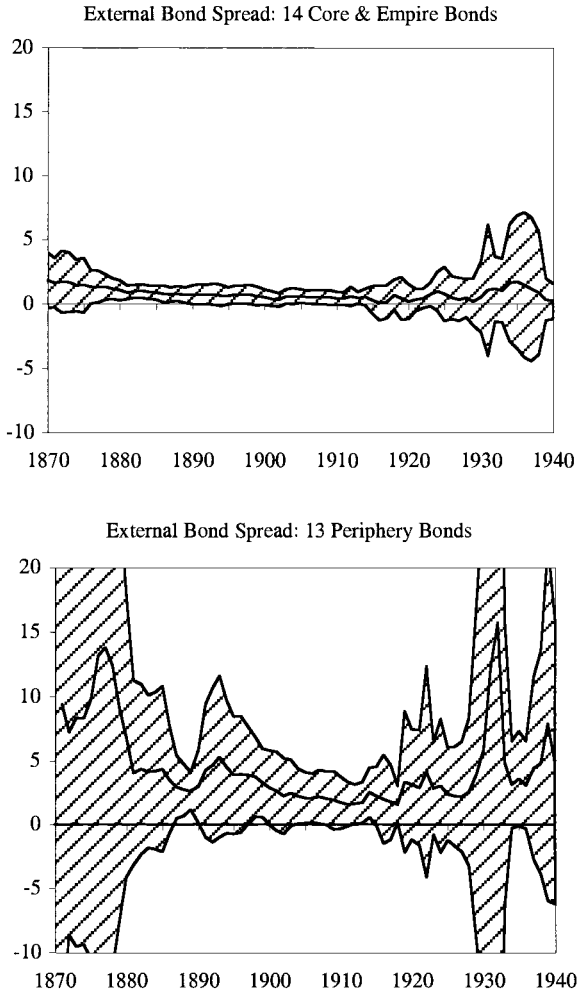

Fig. 3.8 London bond spreads, core and periphery, 1870–1940
Source: Global Financial Data
Notes: See footnote 57.

The differences between the two subsamples are very striking: The core had much smaller country risk than the periphery, as expected. Core countries

(1996), who use Calmoiris' adjusted gold rate, since at this time government bonds bore silver risk. For interwar Belgium, Denmark, Finland, France, Italy, Norway, Portugal, Sweden, Turkey, and Uruguay, GFD does not report gold or sterling bonds, so we collected new interwar-yield data on London sterling or gold bonds from *Investor's Monthly Manual, The Times, The Wall Street Journal,* and *The Economist*. For further details see Obstfeld and Taylor (forthcoming).

usually had interest rates within 1 or 2 percentage points of Great Britain's. The periphery could have spreads as large as 10 percentage points, which was tantamount to having a bond in default in many cases. But the figures also show some similarities, once we normalize for this scale difference: Both core and periphery experienced a convergence in bond spreads up to 1914, and then a good deal of volatility in the interwar years, when spreads widened.

The gradual convergence of bond spreads warns us that a simple static "on and off" gold indicator is unlikely to capture the full dynamics of evolving country risk in this period. Intuitively, these figures hint at high levels of persistence or serial correlation in bond spreads, and it is easy to imagine why. Bond spreads are a function of reputation, which, in capital markets as in any other repeated game, cannot be built overnight. Instead, there is an "I know what you did last summer" effect: One's reputation in the previous period is likely to have substantial explanatory power in deciding one's reputation today. Beyond this, levels of public indebtedness were relevant for at least some countries. A general concern is that macroeconomic variables correlated with gold standard adherence might be responsible for the apparent pre-1914 benefits of going on gold, or might mask such benefits after the First World War. Before the war, countries on gold may have had more disciplined fiscal policies, lower public debt, and hence more favorable treatment by the bond markets. On the other hand, perhaps countries that inflated away their public debts in the early or mid-1920s would have been unlikely to rejoin gold at parity, making high public debts and a return to gold at prewar parity positively correlated variables. In these circumstances, omitting macrocontrols could lead us to overestimate the prewar benefit of gold standard adherence and underestimate the postwar benefit of returning to gold at the prewar par.[58]

Following Bordo and Rockoff (1996), we investigate the relationship between the dependent variable country risk, measured by the bond spread over London, $\text{SPREAD}_{it} = \text{YIELD}_{it} - \text{YIELD}_{\text{UK},t}$, and selected macroeconomic policy variables that could play a role for country i and time t. One such variable is gold standard adherence, measured by two dummy variables: GSPAR_{it}, which takes the value 1 if on date t country i is on gold at

58. Flandreau, Le Cacheux, and Zumer (1998) argue that a major factor driving the evident convergence of bond spreads after the early 1890s and through 1914 is worldwide inflation resulting from gold discoveries, a factor that caused both an unexpected reduction in countries' ratios of public debt to nominal GDP and a more widespread adherence to the gold standard. For the pre-1914 period, Flandreau, Le Cacheux, and Zumer investigate borrowing spreads over London using an all-European country sample different from that of Bordo and Rockoff (1996) and an econometric specification encompassing the public debt ratio to GDP as well as gold standard adherence. They report benefits from gold standard adherence on the order of 35–55 basis points. They also find a positive effect of public debt on borrowing spreads. (Bordo and Rockoff included the public deficit in their estimating equation but found little effect.) It is possible in principle that some of the benefits ascribed by Bordo and Rockoff to gold standard adherence before 1914 can be accounted for by a tendency of association with more moderate real public debt levels, a point that provides a strong rationale for including the debt as an explanatory variable.

the 1913 parity, and GSDEV_{it}, which takes the value 1 if the country is on gold at a devalued parity after 1913. Monetary policy reputation is proxied by the lagged inflation rate, $\text{INFL}_{i,t-1}$. As a final macroexplanatory variable, we examine the effects of lagged public debt levels, measured by the ratio of debt to output, $\text{PUBDGDP}_{i,t-1}$. We also include country fixed effects to capture constant but unmeasured political, economic, institutional, or geographic features of individual countries (e.g., location on the periphery).

Like Bordo and Rockoff (1996), we also find it necessary to account for global interest rate shocks that affect spreads in all markets in a given year. To do this, following the logic of the "international capital asset pricing model," we include (with a country-specific slope, or β) a measure of market risk in the form of $\text{SPREAD}_{W,t} = \text{YIELD}_{\text{WORLD},t} - \text{YIELD}_{\text{UK},t}$, where this term is the (1913 GDP-weighted) average world spread on the "safe rate" (London) for the countries in the sample at time t.[59,60]

Using pooled annual data for a large sample of countries, the basic regression equation is then of the form

$$\text{SPREAD}_{it} = \alpha_i + \beta_i \text{SPREAD}_{W,t} + \gamma X_{it} + u_{it} \tag{4}$$

where

$$X_{it} = \begin{pmatrix} \text{GSPAR}_{it} \\ \text{GSDEV}_{it} \\ \text{PUBDGDP}_{i,t-1} \\ \text{INFL}_{i,t-1} \end{pmatrix}$$

59. We experimented with other ways to control for time-specific asset market shifts, such as simple time dummies, but the results appear robust.

60. Bond spread series as described in footnote 57.

Gold standard adherence data are from Meissner (2001) and Obstfeld and Taylor (forthcoming), available for all countries in all years. Other variables are available for only a subset of years and countries, and this restricts the sample in our econometric tests accordingly.

Central-government public debt data (mostly starting in 1880) come from Bordo and Jonung (1996) for a sample of fourteen countries consisting of Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands (starting 1900), Norway, Sweden, Switzerland (starting 1913), the United Kingdom, and the United States. For those countries, the same source has data on nominal GDP. After 1914, we augment our other public debt data with the total central government debts reported by United Nations (1948); and we use the nominal GDP figures from Obstfeld and Taylor (2003) or GFD. Additional sources for debt were as follows. Argentina: della Paolera (1988). Australia: Barnard (1987). Austria-Hungary: Niall Ferguson, based on data collected by Marc Flandreau (unpublished). Brazil: IBGE (1990) and Levy (1995). Chile: Mamalakis (1978–89). Egypt: Niall Ferguson, based on Crouchley (1938). India: Reserve Bank of India (1954). New Zealand: Lloyd Prichard (1970). Portugal: Valério (2001). Spain: Barciela and Carreras (1989). Turkey: Tezel (1986). Uruguay: unpublished data from Reto Bertoni, kindly provided by Luis Bértola, and based on the official data from *Anuarios Estadísticos*. Debts relative to nominal GDP were calculated using nominal GDP data from Mitchell (1992, 1993, 1995), collated or augmented by Bordo and Schwarz (1997) and GFD, interpolated or supplemented by other sources as follows. Argentina: della Paolera and Ortiz (1995). Austria-Hungary: Niall Ferguson, based on data collected by Marc Flandreau (unpublished). Egypt: Yousef (forthcoming). France: Jones and Obstfeld (2001). India: Goldsmith (1983). New Zealand: Hawke (1975) and Lineham (1968). Portugal: Nunes, Mata, and Valério (1989). Spain: Prados (2002). Uruguay: Bértola (1998) and Bertino and Tajam (2000).

Table 3.4 Country Risk and the Gold Standard, 1870–1913

	OLS	AR1
N	563	546
Adjusted R^2	0.68	0.84
Mean of dependent variable	1.72	1.70
Standard error of dependent variable	1.52	1.51
Standard error of estimate	0.86	0.60
Durbin-Watson statistic	0.59	1.37
GS	–0.39 (0.16)	–0.50 (0.19)
PUBDGDP($t-1$)	–0.05 (0.14)	0.06 (0.22)
INFL($t-1$)	0.69 (0.48)	0.75 (0.03)
ρ	—	0.75 (0.03)

Sources: See text and footnotes 57 and 60.

Notes: The dependent variable is SPREAD as in figure 3.8. Standard errors appear in parentheses. Country fixed effects (α_i) and betas (β_i) are not reported. The seventeen countries in the unbalanced panel are Argentina, Australia, Austria-Hungary, Brazil, Canada, Chile, Egypt, India, Italy, Japan, New Zealand, Norway, Portugal, Spain, Sweden, the United States, and Uruguay. There are some missing data. In the AR1 model a common autoregressive parameter ρ applies to all countries.

is the vector of explanatory variables. (We also tried interacting debt and inflation with a dummy variable equal to 1 for the periphery countries, not including regions of the British Empire, to capture the possibly different risk treatment of established versus emerging markets, but the results were insignificant and are therefore not reported.)[61] The main question we ask is whether 1914 was a watershed—that is, if the interwar gold standard differed from its predecessor. Accordingly, we investigate this relationship on prewar (1870–1913) and interwar (1925–31) samples.

In tables 3.4 and 3.5 we report results for the prewar (1870–1913, using December yields) and interwar (1925–31, using June yields) periods. Since

We also tried using deficit-to-GDP ratios, following Bordo and Rockoff (1996), but, like them, we found deficit ratios to be statistically insignificant in preliminary testing.

Inflation data are based on consumer (or GDP) price indices taken from Obstfeld and Taylor (2003), Bordo and Schwarz (1997), and GFD, supplemented by other sources above or as follows. Argentina: Irigoin (2000); Cortés Conde (1989); and from della Paolera and Ortiz (1995). Austria-Hungary: Schulze (2000). Chile: Braun et al. (2000). Egypt: Yousef (forthcoming). India: Goldsmith (1983). New Zealand: an implicit deflator of GDP, based on nominal GDP as above, and real GDP from Maddison (1995). Portugal: Nunes, Mata, and Valério (1989).

We are unable to make our pre-1914 analysis of spread-debt relationships comparable with that of Flandreau, Le Cacheux, and Zumer (1998), as their data set, which comprises a different country sample than ours, has not been made available. Besides apparently covering the countries in our prewar sample, excluding Argentina, Australia, New Zealand, and the United States, Flandreau and colleagues' sample adds public debt data for Switzerland and some additional "European peripheral" countries. Judging from the 1892 data from Haupt (1894) graphed by Dornbusch (1998), the European peripheral countries had significant public debts relative to GDP.

61. The core and empire countries are Australia, Belgium, Canada, Denmark, France, Germany, India, the Netherlands, New Zealand, Norway, South Africa, Sweden, Switzerland, and the United States. The periphery countries are Argentina, Austria, Brazil, Chile, Finland, Greece, Hungary, Italy, Japan, Mexico, Portugal, Spain, and Uruguay. See figure 3.8.

Table 3.5 Country Risk and the Gold Standard, 1925–31

	OLS	AR(1)
N	160	137
Adjusted R^2	0.92	0.93
Mean of dependent variable	0.94	0.88
Standard error of dependent variable	1.21	1.15
Standard error of estimate	0.34	0.31
Durbin-Watson statistic	1.79	1.87
GSPAR	–0.31 (0.12)	–0.25 (0.11)
GSDEV	–0.60 (0.18)	–0.52 (0.17)
PUBDGDP($t-1$)	1.24 (0.44)	1.64 (0.44)
INFL($t-1$)	0.14 (0.08)	0.00 (0.12)
ρ	—	0.37 (0.05)

Sources: See table 3.4.

Notes: GSPAR denotes gold standard restored at the 1913 parity; GSDEV denotes gold standard restored at a devalued parity. The twenty-three countries in the unbalanced panel are Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Denmark, Egypt, Finland, France, Germany, Hungary, India, Italy, Japan, New Zealand, Norway, Portugal, South Africa, Sweden, the United States and Uruguay.

we are focusing on spreads against London, and we implicitly treat London as a benchmark of what is a safe yield under gold standard credibility, we omit all other interwar years in our sample. Column (1) shows the ordinary least squares (OLS) results, while column (2) adds an autoregression (AR1) correction since we find evidence of high serial correlation in column (1).[62]

Being on gold appears statistically significant before 1914, subtracting about 50 basis points from the spread over London. But being on gold at the 1913 parity appears to be only about half as valuable for the interwar years 1925–31.

Public debt and inflation are seen to have had effects that were quantitatively small and of low statistical significance in the prewar period. The prewar autoregressive parameter is quite high, 0.75, suggesting that during the classical gold standard period countries could rely on some reputational persistence to help them maintain credibility in the capital market. Before 1914, then, classical gold standard adherence alone seems to have been sufficient to warrant the market "seal of approval."[63,64]

62. Using mid-year data interwar expands the time dimension to seven years, since June 1925 follows British resumption and June 1931 precedes British suspension of the gold standard. For the prewar period, the Durbin-Watson statistics for the uncorrected equations are very low. The AR1 model was also used by Bordo and Rockoff (1996). Flandreau, Le Cacheux, and Zumer (1998) add additional controls, the export-to-output ratio and output per capita, which appear to soak up some serial correlation.

63. According to our AR(1) estimate, for example, a debt-GDP ratio of 100 percent, assuming linearity, would raise the cost of foreign borrowing by only 6 basis points per year. Evidently, markets believed that prewar gold standard countries would take the steps needed to make good on their debts.

64. Flandreau, Le Cacheux, and Zumer (1998, 145) conclude that before 1914, "countries had to plunge quite deep into debt before they started feeling the pain." Core countries gener-

It is important to note that this pattern does not hold for the interwar period. For that era, the market seems to have been more discerning in its scrutiny of *all* borrowers' public debt data (although inflation remains unimportant). In these samples we also find somewhat weaker evidence of reputational persistence (as measured by the autoregressive parameter of 0.37), perhaps further evidence of the fragile credibility associated with the interwar gold standard where markets seemed to discount reputation.

Our estimates suggest that an interwar increase in public debt equivalent to 10 percentage points of GDP could raise spreads by 12 to 16 basis points. By this measure, the sensitivity of bond spreads to debt was much larger after the war than before.

These findings may help us to understand why many policymakers in the 1920s and 1930s so feared the market response to unbalanced public budgets, notwithstanding the countercyclical case for fiscal expansion (James 2001). In this period, being on gold was not, in itself, enough to soothe markets.

A noteworthy finding in the 1925–31 results of table 3.5 is that returning to gold at a devalued parity is estimated to have fully twice the beneficial effect of returning at prewar parity, very much contrary to the Bordo-Edelstein-Rockoff empirical result. This finding supports the theoretical view of Drazen and Masson (1994) that policymakers may hurt rather than enhance their credibility through policies that appear tough in the short term but are too draconian to be sustained for long. It also shows that interwar markets could forgive the expropriation of prior bondholders, provided the current economic fundamentals looked sustainable.

One concern about the results of table 3.5 is that they may conflate the benefits countries gained when they returned to gold with the spread effects of the dire circumstances in which countries left gold (never to return) prior to Great Britain's own departure in September 1931. Our on-gold dummy captures the complement of the set of all dates on which a country was on gold. Thus, we may overstate the case for gold by viewing the effects of the gathering Great Depression simply as a market response to gold abandonment.

To address such an overstatement we add a third dummy, GSOFF, which takes a value of 1 for years in which a country was off gold following a prior interwar resumption. Table 3.6 reports the results of estimation. In these regressions, the effect of returning to gold at par is wiped out, whereas the effect of returning at devalued parity, although smaller than in table 3.5 (around 40 basis points now), remains significant. Being forced off of gold raised spreads by 50–60 basis points, and the effect is highly significant.

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ally had public debt levels at which, according to the authors, "markets did not inflict massive punishments." Unlike in our sample, as we have noted, those authors do find that debt raised spreads before 1914.

Table 3.6 Country Risk and the Gold Standard, 1925–31

	OLS	AR(1)
N	160	137
Adjusted R^2	0.93	0.93
Mean of dependent variable	0.94	0.88
Standard error of dependent variable	1.21	1.15
Standard error of estimate	0.33	0.30
Durbin-Watson statistic	1.77	1.71
GSPAR	–0.02 (0.15)	0.04 (0.13)
GSDEV	–0.45 (0.18)	–0.37 (0.17)
GSOFF	0.53 (0.17)	0.58 (0.17)
PUBDGDP($t-1$)	1.08 (0.43)	1.41 (0.42)
INFL($t-1$)	0.14 (0.08)	0.04 (0.10)
ρ	—	0.40 (0.05)

Sources: See table 3.5.
Notes: GSOFF denotes gold standard suspension after interwar resumption.

These results are not surprising. Primary exporting countries such as Argentina, Australia, and Uruguay returned to gold at par only to be forced off in 1929–30 amid sharply higher external borrowing costs. The significant negative coefficient on GSPAR in table 3.5 mainly reflects the fact that these countries enjoyed lower external borrowing costs before the onset of the Depression. (For the same reason, estimating over the truncated period 1925–30 attenuates the effect of GSPAR.) Both the Drazen-Masson effect and the importance of public debt remain, however, in table 3.6, so these may be regarded as robust features of the interwar capital market.

In Obstfeld and Taylor (forthcoming), we explore a different specification, but our main conclusions do not change very much. Accounts of the Great Depression (such as Kindleberger 1986) emphasize the role of adverse terms of trade shocks in forcing primary exporters to leave gold prior to Great Britain's own 1931 departure. Thus, we add the terms of trade as an explanatory variable in our equation but omit GSOFF. We also allow for the spread effects of countries' default statuses. The most notable change from the preceding results is a decline in the prewar "good housekeeping" effect to roughly −25 basis points, an estimate that remains highly statistically significant. The terms of trade are a significant determinant of spreads between the wars but not prior to 1914.

To recapitulate: Unlike Bordo, Edelstein, and Rockoff (1999), we find very different behavior of bond spreads in relation to the gold standard over the interwar period 1925–31 as compared to the pre-1914 period. This may be ascribed mainly to differences in concept (use of around-secondary-market bond yields in London versus new issues in New York) and differences in macroeconomic control variables (government debt rather than deficit). Of these features in our empirical approach, the first, at least, seems

necessary if we are to make comparisons on an equal footing with Bordo and Rockoff (1996).

Before 1914, we find that the gold standard did indeed confer a "seal of approval," with macrofundamentals such as public debt and inflation mattering little. For the interwar period, a return to gold after devaluation (as in the case of France) seemed more credible, notwithstanding the arguments that led Great Britain and other countries to return to gold at par; indeed, returning at par yielded small benefits at best. Moreover, for core and periphery countries alike, high public debts were punished, suggesting that policymakers' room for maneuver was further curtailed.

Our results both on the drop in spreads associated with going on gold, and on markets' differential response to public debt prewar versus interwar, suggest that the interwar gold standard was indeed seen as different and less credible than its pre-1914 predecessor. It remains fully to reconcile these results with findings such as those of Hallwood, MacDonald, and Marsh (1996) that indicate a highly credible gold standard during the late 1920s, at least in the short term. Perhaps the bond markets adopted a longer perspective under which protracted adherence to unchanging gold parities seemed less probable than short-term adherence.

3.3.2 The Upturn

After the immediate post–World War II dislocations, the world economy began to reconstitute its severed linkages, a process both promoting and promoted by the return of some degree of durable prosperity and peace. Postwar policymakers, through the IMF, successive multilateral trade liberalization rounds, current account currency convertibility, and other measures, successfully promoted growing world trade. By the late 1960s, the very success of these initiatives in forging trading linkages among countries simultaneously made capital flows across borders ever more difficult to contain. As a result, the trilemma reemerged with full force, and on a global scale, in the early 1970s. The Bretton Woods system, initially designed for a world of tightly controlled capital movements, blew apart. The major industrial countries retreated to floating exchange rates.

While initially viewed as a temporary expedient, floating rates have remained a durable feature of the international financial landscape. Floating rates helped reconcile the social demand for domestic macroeconomic stabilization with the interest of the business community for open markets in goods and assets. Some episodes of exchange rate misalignment have prompted calls for renewed protection and even capital account restrictions. Some of these calls have been accommodated, but usually not in the form of across-the-board restrictions on international transactions.

Other forces have also helped to promote liberalization. In Europe, the political and economic rationales for a large single market have prompted ongoing financial liberalization; at the same time, the political (and, some argue, economic) imperative of stable exchange rates has pushed toward the

logical conclusion of a single currency, the euro. Other regions, likewise, have opted for fixed exchange rates, either by some form of ultrahard peg or outright dollarization, in either case bending to the trilemma by giving up monetary policy autonomy.

Since the late 1980s, the drive toward capital account liberalization in the developing world is probably the most striking pattern in the evolution of global capital markets. Clearly one element has been the widespread failure in the periphery of populist policies adopted in the 1980s and earlier. Reactions to those failures gave free-market ideologies a greater influence. On a larger scale, the collapse of the Soviet empire in the late 1980s also highlighted the advantages of the capitalist model. The resulting decline in Cold War tensions certainly held out the promise of greater fluidity in private international capital. Whether exchange rates float or are fixed, there is much greater openness to private financial flows on the periphery than in the 1980s. In part a reflection of U.S. business interests, American administrations have pushed developing economies to liberalize on capital account; in some cases, liberalization ran far ahead of domestic financial systems' absorptive capacities, and clashed with national exchange rate policies. The resulting contradictions helped spark the developing-country currency crises of the latter 1990s. To attract productive capital from the industrial world remains a prime goal on the periphery, however, and that requires market-oriented reforms, stable macropolicies, and transparency in governance and legal systems.

There is, however, one critical dimension in which pre-1914 international capital flows differ sharply in nature from what we see today, with important implications for the periphery; to see this we return to the distinction between net and gross international asset stocks. A cursory glance at the data reveals that this problem is very serious in recent decades but was relatively unimportant in the pre-1914 era of globalization. The reason is simple: In the late nineteenth century the principal flows were long-term investment capital, and virtually unidirectional at that. There was one notable exception, the United States, where both inflows and outflows were large. But in most cases key creditor nations, principally Great Britain but also France and Germany, engaged in the financing of other countries' capital accumulation, and in doing so, developed enormous one-way positions in their portfolios.

For example, circa 1914 the scale of Argentine assets in Great Britain's portfolio was very large, but the converse holding of British assets by Argentines was trivial by comparison. Thus, the nineteenth century was an era of one-way asset shifts, leading to great portfolio diversification by the principal creditor-outflow nations like Great Britain, but relatively little diversification by the debtor-inflow nations. To a first approximation, the gross asset and liability positions were very close to net in that distant era. The 1980s and 1990s are obviously very different: For example, the United States became in this period the world's largest net debtor nation. While ac-

counting for the biggest national stock of gross foreign liabilities, however, the United States also held the largest stock of gross foreign assets.

Our earlier discussion of the gross stock data, and our inferences concerning the recovery of foreign assets and liabilities in the world economy after 1980, therefore need considerable modification to take into account this problem. Indeed, it is a significant problem for all of the countries concerned: The ranking of countries by foreign assets in the IMF data is very highly correlated with the ranking by foreign liabilities. Countries such as Great Britain, Japan, Canada, Germany, and the Netherlands are all big holders of both foreign assets and liabilities. Strikingly, when we net out the data the result is that, since 1980, the net foreign asset position (or liability) positions in the world economy have remained very low indeed, as indicated by figure 3.9. Unlike the gross stocks, the net stocks have increased little, and if we trust the asset data rather more (arguably more of the net asset data are collected in richer industrial countries with better accounting methods), then the picture is one of relative decline in the size of net foreign capital stocks relative to GDP.

Thus, for all the suggestion that we have returned to the pre-1914 type of global capital market, here is one major qualitative difference between then and now. Today's foreign asset distribution is much more about asset swap-

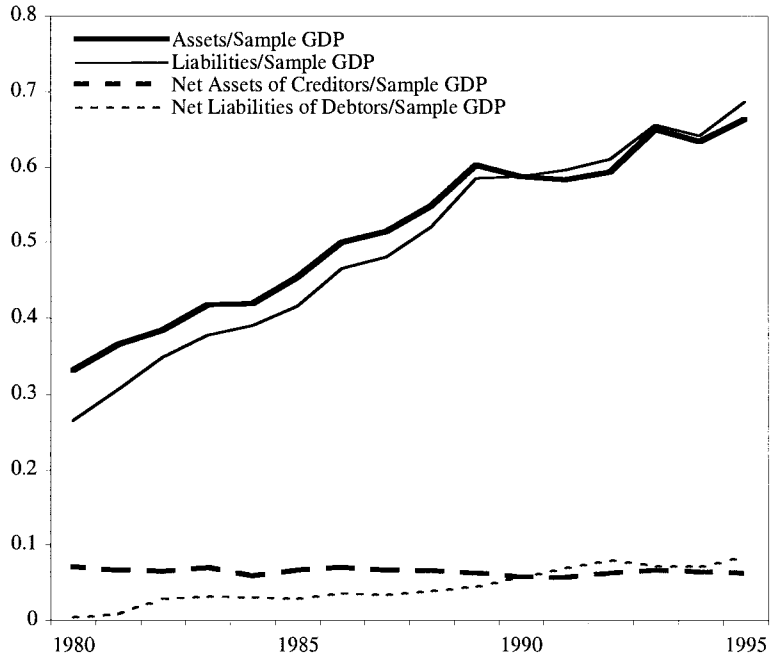

Fig. 3.9 Foreign capital stocks: Net versus gross
Source: IMF.

ping by rich countries—diversification—than it is about the accumulation of large one-way positions—a critical component of the development process in poorer countries in standard textbook treatments. It is therefore more about hedging and risk sharing than it is about long-term finance and the mediation of saving supply and investment demand between countries. In the latter sense, we have never come close to recapturing the heady times of the pre-1914 era, when a creditor like Great Britain could persist for years in satisfying half of its accumulation of assets with foreign capital, or a debtor like Argentina could similarly go on for years generating liabilities of which one-half were taken up by foreigners. Instead, still to a very great extent today, a country's net wealth will depend, for accumulation, on the provision of financing from domestic rather than foreign sources (Feldstein and Horioka 1980).

An interesting, and closely related, insight also follows from looking at the share of less developed countries (LDCs) in global liabilities. This is now at an all-time low. In 1900, LDCs in Asia, Latin America, and Africa accounted for 33 percent of global liabilities; in the 1990s, only 11 percent (fig. 3.3). The global capital market of the nineteenth century centered on Europe, especially London, extended relatively more credit to LDCs than does today's global capital market. Is this surprising? There are various interpretations for this observation. One is that capital markets are biased now, or were biased in the past; for example, did Great Britain, as an imperial power, favor LDCs within her orbit with finance? Or, today, does the global capital market fail in the sense that there are insufficient capital flows to LDCs, and an excess of flows among developed countries? These are hard claims to prove, as market failure could be a cause, as could a host of other factors including institutions and policies affecting the marginal product of capital in different locations. Of course, this result just follows from the fact that many of the top asset holders also figure in the top liability holders, and most of them are developed OECD countries.

Figure 3.10 illustrates both the periphery's need to draw on industrial country savings, and an important dimension in which the globalization of capital markets remains behind the level attained under the classical gold standard. In the last great era of globalization, the most striking characteristic is that foreign capital had its biggest impact (relative to receiving region GDP) in capital-scarce poor countries, although it also moved to some richer countries. The richer countries were the settler economies where capital was attracted by abundant land, and the poor countries were places where capital was attracted by abundant labor.[65]

Globalized capital markets are back, but with a difference: Capital transactions seem to be mostly a rich-rich affair, a process of "diversification finance" rather than "development finance." The high-impact creditor-

65. On the broad distribution of foreign capital then, see Twomey (2000).

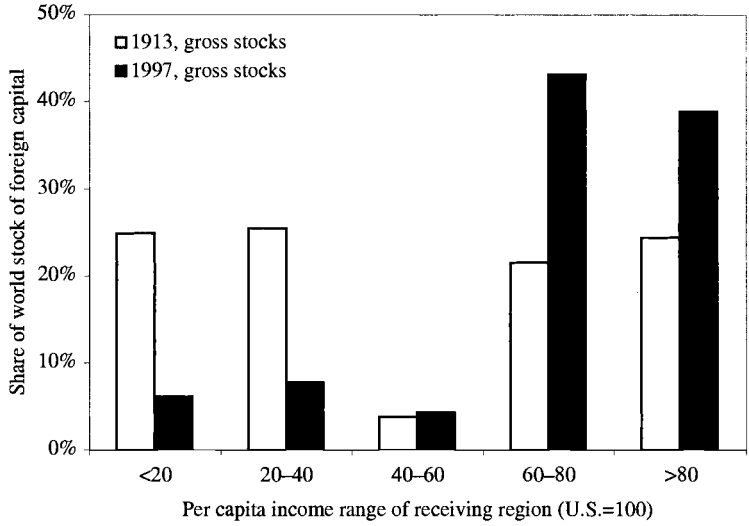

Fig. 3.10 Did capital flow to poor countries? 1913 versus 1997

Sources: The 1913 stock data are from Woodruff (1967) and Royal Institute of International Affairs (1937); incomes are from Maddison (1995). The 1997 data are from Lane and Milesi-Ferretti (2001), based on the stocks of inward direct investment and portfolio equity liabilities.

debtor country pairs involved are more rich-rich than rich-poor, and today's foreign investment in the poorest developing countries lags far behind the levels attained at the start of the last century. In other words, we see again the paradox noted by Lucas (1990), of capital failing to flow to capital-poor countries, places where we would presume the marginal product of capital to be very high. The figure may also understate the failure in some ways: A century ago, world income and productivity levels were far less divergent than they are today, so it is all the more remarkable that so much capital was directed to countries at or below the 20 percent and 40 percent income levels (relative to the United States). Today, a much larger fraction of the world's output and population is located in such low-productivity regions, but a much smaller share of global foreign investment reaches them.[66]

As we have noted, capital is discouraged from entering poorer countries by a host of factors, and some of these were less relevant a century ago. Capital controls persist in many regions. The risks of investment may be perceived differently after a century of exchange risks, expropriations, and defaults. Domestic policies that distort prices, especially of investment goods, may result in returns too low to attract any capital. These conditions make

66. See Clemens and Williamson (2000) for a detailed analysis of the determinants of British capital export before 1914.

a difficult situation much worse. Poorer countries must draw on foreign capital to a greater extent than they do at present if they are to achieve an acceptable growth in living standards. This is a fundamental reason that reform and liberalization in the developing world, despite the setbacks of the late 1990s, are likely to continue, albeit hopefully with due regard to the painful lessons learned in the recent past.

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Comment Richard Portes

The key assertion of this paper is that the extent of globalization or integration of capital markets since the second half of the nineteenth century has followed a clear pattern: a remarkable rise of capital market globalization from (say) 1860 to 1914, then a sharp fall in World War I, followed by a trough lasting over fifty years, then a strong new upsurge to the present day. The paper offers a hypothesis to explain this pattern: the "trilemma" and national policy responses to it. A subsidiary theme is the shift from cap-

Richard Portes is professor of economics at the London Business School, president of the Centre for Economic Policy Research, and a research associate of the National Bureau of Economic Research.

ital flows as development finance in the first period of globalization to capital flows as portfolio diversification across industrial countries in the second globalization era.

There is no attempt to test the trilemma hypothesis, even to confront it with alternatives. The main effort is to assemble wide-ranging evidence that the pattern itself was very general and observable in both quantities (cross-border capital flows) and prices (interest rates, equity returns).

There are alternative drivers of capital mobility that may suggest at least some qualifications to the trilemma hypothesis. It is not clear whether some are consistent with the historically observed oscillation that is documented here, nor whether they are truly exogenous, as the trilemma-based forces could claim to be.

Consider first information and communications technology (ICT). Many regard that as the primary force behind the global integration of capital markets in the past two decades. One could say this recent ICT revolution has only one parallel historically, the invention of the telegraph and then the telephone pre-1914—with no such impetus in the interwar period, but on the other hand, no breakdown of the technology either. So that might get us somewhere in explaining the two waves of globalization, but it does not have anything to say about the interwar trough. The same could be said of financial market technology itself—there was a remarkable development of financial instruments in the first wave of globalization, and again in the past two decades, but of course no "technological regress" that could be responsible for the interwar period.

The enforcement of international contracts is essential for financial integration. Pre-1914, this was ensured by imperial structures and gunboat diplomacy. They offered a political and legal framework sufficient to support development finance from rich to poor countries and the accumulation of large net foreign asset positions in unreliable environments. That framework disintegrated in the First World War, and only from the late 1960s onward did we get adequate substitutes: the Paris Club, the London Club, IMF conditionality, and overall U.S. geopolitical hegemony that often exerted pressure on debtors to meet their contractual obligations.

International financial instability—in particular, volatility and wide swings in exchange rates—is a deterrent to financial integration. Indeed, many would say that the first era of globalization was underpinned by the gold standard and British hegemony. Yet although the dollar peg, gold exchange standard established at Bretton Woods was instrumental in maintaining monetary discipline and low inflation, and American hegemony replaced the British role, the period 1945–70 nevertheless did not see a major advance in international financial integration. Financial globalization took off again after the Bretton Woods exchange rate mechanism broke down. And in view of the crises of 1982, 1995, 1997, and 1998, it is hard to see the IMF as the guarantor of stability. This may help, however, to explain why

the major cross-border financial flows have been between advanced countries rather than between them and the emerging market countries.

We might regard the globalization of production and of financial institutions as a partly exogenous driver of cross-border financial flows. The imperialist system played this role pre-1914, and in recent decades it has been the large multinational firms that invest abroad and develop extensive outsourcing that also requires financial support. There were "global" investment banks such as Rothschilds and Barings pre-1914. They played a significant role in the sovereign lending boom of the 1920s, too, but only in the past decade or two have we seen real financial power accrue to Goldman Sachs and the other "bulge-bracket" banks. Again, there is some relation to the historically observed pattern of financial globalization, but perhaps not a dominant explanation.

A final hypothesis presents itself: that current accounts—or savings-investment imbalances—are the primary drivers of capital accounts. The interwar trough for financial globalization corresponds to a period in which current account surpluses and deficits were severely constrained by major disturbances to international trade.

We see, therefore, that there is a wide variety of alternatives to the authors' fundamental hypothesis. The observed pattern could have been driven by exogenous common shocks rather than common national policy responses to the trilemma. In that case, the appropriate structural break came in 1930, rather than in World War I, and the trough is also not as long-lasting—say, until the late 1950s. There is evidence that international capital markets did reopen substantially in the 1920s, with a buildup of sovereign debt that came crashing down in the defaults of 1931–33. Again, restrictions on capital movements started to break down immediately after the restoration of current account convertibility at the end of the 1950s, and it was the growing capital flows of the 1960s that led to the breakdown of the Bretton Woods exchange rate regime.

None of this in any way diminishes the tremendous achievement of the authors in developing the empirical record of financial globalization. There are many new and important stylized facts that they establish in this paper. The wealth of data, analysis, and interpretations gives a discussant ample opportunity to find interesting questions, and I shall offer only a short list of those that intrigued me.

First, the asset stock data of table 3.2 show that net holdings were close to gross holdings pre-1914, whereas net are now much lower than gross. The authors interpret this as a shift from development finance to portfolio diversification, and overall I find this convincing and illuminating. But we know that this is not so true of foreign direct investment or bank lending as it is of portfolio flows. Moreover, home bias is still very strong—is that consistent with the story? There are also some quite substantial discrepancies between total assets and total liabilities (e.g., 1960, where they differ by a

factor of 3). And it would be good to get the authors' views on why the U.K. share of total assets stayed so stable (indeed, so high) from 1960 to 1990, while the U.S. share fell by three-fifths to a level only slightly above that of Great Britain.

The discussion in the text now resolves two puzzles that appear from the covered interest parity data (see fig. 3.4): the apparently systematic positive interest rate gap in favor of New York pre-1914, and the surprisingly large size of the pre-1914 differentials. In fact, they conclude, there was an extraordinarily high degree of integration among the core money markets pre-1914, and I find this convincing.

I am less convinced by the results of tables 3.4 and 3.5 on real interest parity. For example, in table 3.4, with their preferred filter (linear detrend), the Great Britain "band of inaction" widens monotonically from 1890 to 1974. All bands but that of France are much wider post-1973 than in the interwar period. Can we really believe that transaction frictions were greater? Why should the bands be explained entirely by frictions in goods trade—do capital market frictions not also impair the ability to arbitrage in a way that hinders real exchange rate convergence? I therefore find it hard to give great weight to table 3.5.

Interesting questions arise from the discussion of equity and bond returns. Gross equity portfolio flows did not become important until the late 1980s and are still less than cross-border bond flows. I would therefore not expect convincing evidence of "coherence of the returns in G7 equity markets" over a long historical period, nor of the U-shape hypothesis. And no matter how long I look at figure 3.5 and read the corresponding passage in the text, I do not in fact see it. The rationale given by figure 3.6 (an extension of the analysis in Eichengreen and Sachs 1985) is also not convincing: If one removes one or at most two outliers, the upward-sloping line in the right-hand panel becomes vertical. For bonds, again, the U-shape claimed by the authors in figure 3.7 does not seem obvious to me.

I conclude with a few additional problems for the trilemma story. First, the authors suggest that World War I brought political pressures for demand management, hence for independent national monetary policies, hence for restrictions on capital flows—this was the common national policy response conditioned by the trilemma. But in fact, capital mobility rose substantially in the 1920s, with the boom in sovereign lending. Second, they say that it was a common national policy choice (again, a response to the trilemma) to move away from the Bretton Woods exchange rate regime. I can accept this as a characterization of the half-hearted, ultimately unsuccessful attempts to put the system back together again in 1973–76. But I agree with the authors that it is not an explanation for the breakdown of the system—that, as they say, was due to rising capital mobility. Finally, how does 1930–45 fit in the trilemma scheme? Most countries went off gold to float their exchange rates, but at the same time capital controls multiplied.

The problem was in fact the debt defaults of 1931–33, then the approach of war.

All this makes me eager to read the authors' forthcoming book, which will expand on these and other issues in the historical development of capital markets.

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