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Problems in the History of the International
Economy since 1870: The Gold Standard

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Central to any discussion of the working of the International economy after 1870 is the question of international monetary arrangements. These have fascinated economists as objects of theorising and test-beds for changing theories, as well as subjects for reform proposals. For more than fifty years, since difficulties with and the eventual collapse of the inter-war gold standard raised the question of how its pre-war predecessor actually worked and how inter-war difficulties stemmed in part from a misreading of history on the part of those involved in the reconstruction and operation of the system after 1919, monetary historians have also subjected both the pre-war system and its inter-war successor to repeated scrutiny. The purpose of this paper is to examine the literature on both the pre-war and inter-war Systems with a view to emphasising the puzzles that remain in the literature and possible future direction for research.

At the centre of any concern with the ‘working’ of the gold standard as a set of monetary arrangements is the balance of payments adjustment mechanism. For the pre-1914 period, the outstanding characteristic of the era was the maintenance of a regime of fixed exchange rates among the major industrialized countries for almost 35 years without the support of exchange restrictions, import Controls and the like in circumstances where few countries left the standard once they adopted it and devaluations or revaluations were highly exceptional. All of this occurred while there were substantial changes in the relative economic position of the countries involved – for example, the marked relative decline of Britain and the rise of Germany and the United States – and yet only rare examples of sustained international macro-economic equilibria in individual countries.

In contrast, the inter-war gold standard system was short-lived. Only one country retained its restored post-war gold standard parity without exchange Controls throughout the 1930s – or almost, for it was devalued and pegged to the Italian lira after the Italian occupation of April 1939 – the Albanian franc (Yeager 1976, 314). Few survived a decade. Sterling lasted a week less than 77 months. During the period countries were on the standard, there were several examples of sustained, large, over and under-valuations which markedly affected countries’ macroeconomic performance and were to shape later perceptions as to examples of past mistakes to avoid.

In what follows, I will take the literature for each period separately. For the pre-war period, I will look at both long-term and short-term adjustment. The inter-war period did not last long enough for anything other than short-term adjustment to be a problem.

1870 - 1914

The outstanding puzzle of the pre-1914 gold standard is how the adjustment mechanism worked over the longer term. One knows that it worked *ex post* because countries remained on the standard. Yet, as numerous studies have shown, symptoms of longish periods of disequilibrium were absent.

There was substantial parallelism in national price behaviour (Triffin 1964; McCloskey and Zecher 1976, 1984) without numerous incidents of large declines in money wages (as evidenced by the more general indices) or sustained periods of balance-of-payments-related unemployment. For example, Britain enjoyed a rapid expansion in her exports of coal and a substantial, sustained rise in her income from overseas assets in the 40 years before 1914, not to mention a rise in her overseas investment in the last decade of peace from 2.5 per cent to 7 per cent of GNP. Yet British prices did not behave markedly differently from those of her competitors. Thus from 1903 to 1913, during that massive surge of foreign investment, Britain's cost of living rose by 12.4 per cent while four of her major competitors had an average rise of 13.6 per cent. The respective rises in national income deflators were 13.9 and 17.0 per cent (Phelps Brown and Browne 1968, Appendix 1). The only exception for the pre-war decade came with unit export values for manufactures where the British index rose 13 per cent more than his competitors between 1899 and 1913 (Maizels 1963, 205). Thus it is not immediately apparent what was going on.

It could have been, as suggested by Matthews and his colleagues (1983, 455-6) that rising coal exports, plus rising overseas invisible income, allowed Britain to maintain a higher price level than would otherwise have been the case. However, the need to transfer such large increase in overseas lending would have normally produced deflationary pressures – unless, of course, the rise in lending was largely demand determined and the transfer was appropriately effected through the interest rate mechanism crowding out the appropriate amount of domestic investment, aided, perhaps, by some variant of Brinley Thomas's Atlantic economy model (1973, esp. ch. xv, but see Edelstein 1982, ch. 9).

There is an alternative mechanism in the literature, that discussed by McCloskey and Zecher (1976, 1984), where arbitrage in goods keeps domestic price levels in line across the relevant countries, arbitrage in capital keeps interest rates in line and changes in the demand for nominal money balances determine gold flows and the international price level. Despite their evidence for strong purchasing-power-parity conditions using various published price indices and the economist's presumption in favour of the equalising effects of price competition in tradeable, this would seem only plausible as a long-term explanation rather than a short-run one as suggested by the authors. For when one looks at individual commodities, even in the modern period where markets are more integrated, there seem to be substantial price discrepancies in tradeable across countries beyond those which can be explained by tariffs and transport costs (Lipsey 1984). If these discrepancies can develop, however, then in a world of sticky money wages their elimination should show up in cross country variations in capacity utilization and employment. Thus we are back to our original problem.

Of course, the long-term and short-term adjustment processes should be related, if only because the long run is the sum of a succession of short runs. However, in looking at the short run a number

of things must be kept in mind. (In what follows, I concentrate on the British literature, if only because of its relative volume). First, one should remember that, strictly speaking, in the short run the pre-war international gold standard was not consciously managed by anybody. The Bank of England certainly took no responsibility for the process. It was not yet consciously acting as a central bank (Sayers 1976, chs. 1-3). As Thomas put it

This is not to imply that the old Lady ‘managed’ the pre-1914 international gold standard system: on the contrary, according to her lights, she minded her own business... (1973, 281).

Thus, any systematic results of the Bank’s behaviour were inadvertent by-products of its actions. Second, even as regards Britain, the Bank of England’s actions do not appear to have been guided by a conscious adherence to any ‘rules of the game’. This should not be surprising, given what we know of the pre-war Bank. Moreover, the notion of a set of ‘rules’, adherence to which would enhance systemic stability was a product of the difficulties of the inter-war years. The formal use of the term itself was an outgrowth of the deliberations of the Macmillan Committee and its report, although the notion was also implicit in many other contemporary discussions, such as those between Britain and France on balance of payments adjustment (Moggridge 1972; Jackson 1985). Rather the pre-war Bank had developed rules of thumb to enable it to meet its statutory obligation to maintain the gold convertibility of its notes which, supplemented by various *ad hoc* devices – at least up to 1907-8 – saw it through any difficulties. These rules of thumb did not produce behaviour patterns consistent with the later rules of the game (Bloomfield 1959, Dutton 1984). Yet they kept Britain on the standard.

At the centre of the discussions in the literature concerning the Bank’s behaviour and its effects are short-term interest rates and the resulting capital flows. Through its manipulation of the Bank rate, the Bank was able to tailor international capital flows to protect its reserve from disturbances that were either domestic or international in origin. (One must include the former because an increase in the domestic demand for money under the arrangements of 1844, had the same effects on the Bank’s reserve position as a balance of payments deficit.) As well, the available evidence suggests that internationally there was a clear dominance of London in any competition for funds in that the pulling power of given changes in interest rates in London greatly exceeded that of any other European centre. Below London there was a clear hierarchy of European financial centres (Lindert 1969). (The United States was something of a maverick in this literature, for without a central bank, with a relatively inelastic set of currency arrangements and with a proclivity for financial instability, it was not only a source of regular seasonal pressure on the rest of the system but also a major source of shocks). Indeed, London’s dominance was so significant that Charles Goodhart could argue on the basis of his statistical evidence that in Britain

the years of the gold standard (1890-1914) were remarkable, *not* because the system enforced discipline and fundamental international equilibrium on this country by causing variations in the money supply, but because the system allowed for the development of such large-scale, stabilising and equilibrating, short-term international capital flows, that autonomous domestic expansion was rarely disrupted by monetary or balance of payments disturbances. (1972, 219).

This does not mean that Britain could not be disrupted by overseas shocks such as the American crisis of 1907. However, if the money supply in Britain was effectively endogenous to British levels of activity, this raises questions as to the long-term stability of the gold standard system – unless, British growth was (a) more stable than growth elsewhere and (b) Britain was able to accumulate increasing short-term international liabilities without running into the Triffin-trap of 1931 or the 1960s.

It would seem from the evidence that both prices and output were more stable in Britain than in the United States during the pre-1914 era (Cooper 1982, 5). It is also likely that this was the case if one compared Britain with most other industrialized or industrialising countries (Maddison 1982, tables 3.8, 4.1, 4.2). As well Britain was able to incur substantial short-term liabilities, with her liabilities/reserve ratio in 1913 being of the same order of magnitude as on the eve of the inter-war financial crisis and with her balance of payments deficits in proportion to her reserves of the same order of magnitude as those which troubled the United States after 1958 (Lindert 1969, 40, 77). Yet, perhaps because they were unknown, these deficits and growing liabilities did not have the same effects on confidence as their successors. Thus, at least up to 1914, the central country in the system was not a source of systemic instability because of large swings in prices, incomes or confidence.

However, the pulling power of London interest rates raises another question. It implies that if Britain was subject to an external shock or internal developments that had the effect of putting her balance of payments into deficit, by raising short-term interest rates she could finance the deficit and in the process pass the strain onto other centres. A good example of such an external shock and the power of the Bank rate mechanism in countering it might be the 1907 crisis which so coloured the Bank's evidence to the National Monetary Commission and its later perceptions.

At one time, the channels through which higher interest rates in London operated were thought to be three; the terms of trade, domestic activity and capital flows. In the case of the terms of trade, high London interest rates induced a liquidation of stocks of raw materials and thus produced a fall in raw material prices and an improvement in Britain's terms of trade and, hence, her balance of payments.

Traditionally, this notion has been associated with Robert Triffin (1947; 1964) but it could as easily have been associated with Ralph Hawtrey. Generally speaking, this possible channel of balance of payments improvement has proved barren when confronted with the available institutional and empirical evidence (Moggridge 1972, 12-13; Lindert, 1969, 44-6). The link between interest rates

and domestic economic activity has also been disputed. While the damping effects of rising short-term interest rates that would accompany a rise in the money supply during an autonomously caused domestic expansion would fit well with the Goodhart story and the evidence for Britain's relative stability, the general run of evidence for the pre-1914 world is not encouraging, even if it is in need of re-working as it is now at least 30 years old. The studies of Tinbergen (1951) and Pasmazoglu (1951) covering both short and long-term interest rates confirmed the unimportance of the link between interest rates and domestic investment, although, given the stability within years or between years of long-term rates reported by Hawtrey (1938, ch. vi), it would be surprising if there were any effects at the long end. Nor were *The Economist* surveys of November 1907, surely the best time for a test over the period given both the level and recent changes of Bank rate, reported by Ford (1962) and Moggridge (1972) all that more helpful as guides as to what one might expect to happen to domestic activity as a result of Bank rate changes in normal years before 1913.

If changes in short-term interest rates had little (or no) effect on domestic activity, then the run of evidence suggests that their major effect must have been felt internationally, either as they discouraged new issues of long-term capital or as they attracted short-term funds to London. Either of these changes in flows would have overseas repercussions which would be felt down the hierarchy of overseas financial centres described by Lindert (1969). On occasion, these effects might not go all that far in that all a rise in Bank rate did was to attract the relevant balances from France, often seen as holding the secondary gold reserves for England and willing to let considerable quantities of gold go without raising interest rates. However, as was sometimes the case, rate rises in London brought defensive rate rises in other centres, then one would expect the effects to be widely diffused down the hierarchy to the weaker, less developed centres, particularly those which were currently large overseas borrowers. In other words, one might expect that the burden of adjustment to British balance of payments problems would be shifted overseas. As Barry Eichengreen recently put it (1985, 18)

It is no coincidence, then, that the convertibility crises of the period were concentrated in the periphery. From the periphery's viewpoint, the operation of the gold standard was anything but smooth.

Eichengreen's statement is merely making explicit what is implicit in many other discussions of the pre-1914 gold standard, including my own (1972, ch. 1). Yet, if this were the case, one would expect to find the history of the periphery littered with financial crises which had their origin in external shocks transmitted via the capital account or reserve flows. If one looks at the history of the periphery, the emphasis is quite different. For the Australian crisis of the 1890s, the emphasis is on internal Australian developments which determined the timing of the downturn and on internal structural imbalances that exacerbated the problem by making Australia more dependent on external

resources and unable to expand its export earnings (Butlin 1964). The evidence for New Zealand, complicated as it is by the Australian connection, is also far from conclusive (Simkin 1951). The same can be said for Canada (Rich 1984) and Sweden (Jonung 1984). Even Ford's (1962) classic study of Britain and Argentina, often taken as the proof of the shifting of the burden of adjustment to the periphery (Bordo 1984, 85-6) is ambiguous in that domestic difficulties often seem to lead (and often cause) foreign induced ones, as is that for Brazil (Fritsch 1983).

The conflict between the implicit conclusions arising from the English literature and the evidence for the periphery may be more apparent than real. The outstanding fact about the pre-1914 gold standard in England was the 'thin film of gold' it rested on. The Bank of England's reserves were extremely small, less than half the annual world output of gold and normally less than five per cent of total central bank reserves (Keynes 1983, XII, 747-8). Thus the balance of payments imbalances and resulting gold flows that would trigger changes in the Bank rate to reverse them would be a *very* small proportion of the world's stock of reserves. Thus, especially as such changes would be likely to be broadly diffused, gold flows attracted to England by a rise in Bank rate would be likely to be extremely small for the periphery as a whole, or even for individual countries on the periphery, some of whom had substantial reserves. As a result, one would not expect the effects implicit in the English literature to be substantial by themselves in normal times, if only because of the stability of the British economy and its monetary arrangements discussed above. Matters might be different if the British balance of payments were subject to substantial external shock, but even here one would expect the repercussions to be limited unless the large shock was external to the European centre of the gold standard so that several centres were acting in concert. This was the case in 1907. But in normal circumstances, one can easily see why histories of the periphery would more often than not see their macroeconomic and balance of payments problems as self-inflicted. Certainly there is room for much more research in this area.

In fact, I think it would be fair to argue that in the case of the pre-war gold standard regime as a whole we still have a lot to learn if we are going to form a consistent picture of both national experience and systemic behaviour in both the short and the long run. Other aspects of what we would like to learn will become apparent when we come to look at the inter-war period.

1919-1931

With our uncertainties as to how the gold standard 'worked' before 1914, it is difficult to argue simply by comparison why it did not work well in the late 1920s and why it collapsed in the subsequent slump. As one might expect, therefore, there are a number of competing explanations in the literature. Rather than simply take them all in turn, in what follows I propose to take the more

promising in order to help organise our thinking and to highlight possible areas for future research.

As before 1914, adherence to the standard after 1919 was a matter of independent national decisions taken, more often than not, without any consideration of their effects on the behaviour of the system as a whole. Unlike the pre-1914 regime, however, decisions to adhere to the standard were not spread over decades but were concentrated into just a few years. Those few years came soon after the massive disruptions of World War I, by far the largest shock the international economy had received in over a century, had transformed the international economic positions of the major participants.

In these disturbed circumstances, even given the best advice available, it was inevitable that the resulting pattern of exchange rates would show some initial misalignments. Moreover, the best advice was often not available. In these circumstances it was also inevitable that there should be some disagreement in the literature as to the degree of misalignment – as there was at the time. One can easily illustrate this point from the discussion of the overvaluation of sterling in 1925, an issue to which I gave something of a fillip almost 20 years ago (Moggridge 1969, 1972). Thus I suspect that, perhaps, by attempting ‘back of the envelope’ calculations, I pushed the discussion too narrowly to 1925. Perhaps, I should have paid more attention to the events of 1919 which, with a sharp drop in hours and no compensating change in wage rates, resulted in a marked fall in firms’ profitability below pre-war levels, which themselves had been flat or falling for over a decade before the war (Matthews, Feinstein and Odling-Smee 1983, 184, 196).

This sharp drop in profits was not reversed during the ensuing slump. Nor was the period of appreciation of sterling towards par an opportune occasion to restore margins. If as Matthews and his colleagues suggest (1983, 315) that the restoration of profits in the early 1920s would have involved a rise in prices relative to wages of 10 per cent, then a much larger change in the exchange rate than I suggested would have been necessary to reduce real wages and restore profits to their depressed pre-war levels, leaving aside any changes in the rate that would have been necessary to offset such changes as the sharp fall in Britain’s overseas investment income as a result of the war (Matthews, Feinstein and Odling-Smee 1983, 470-2).

The reduction in hours in 1919 was a world-wide phenomenon. Given subsequent exchange rate, wage and price movements thereafter, the reduction in profitability was not. The differential effects of 1919 thus need to be compared across the major economies if anyone is to take full account of them when discussing the appropriateness or not of the mid-1920s pattern of exchange rates. All I suggest from a preliminary glance of the literature, especially the comparative work of Phelps Brown and Browne (1968, part II) is that by the mid-1920s profitability in Britain had recovered less from the events of 1919 than elsewhere.

The discussion of 1919 and its aftermath raises another question about some of the more recent

literature. Some discussions of 1925 and the overvaluation of sterling have seen attempts to model the international sector of the British economy from various perspectives and then to suggest that on the basis of the ‘fundamentals’ the exchange rate chosen in 1925 was in some sense appropriate (Hodgson 1972; Matthews 1985). However, these models are normally estimated on 1920-38 data. Thus it would hardly be possible for them to capture the effects of the war or 1919 on the ‘fundamentals’. All they would seem to do is to confirm that, given the structure of the inter-war economy as compared with itself, the 1925 exchange rate was not significantly different from an inter-war equilibrium rate – interesting information perhaps, but not all that helpful.

One should also note, however, that other more recent work concentrating more narrowly on 1925 (Dimsdale 1981; Redmond 1984) have suggested that my 1972 estimate of sterling being *at least* 10 per cent overvalued may be a lower bound estimate, particularly if one takes formal account of not only the sterling-dollar rate, as I did, but also of the full set of multilateral exchange rate and relative price relations. In these more general circumstances, relative purchasing-power-parity estimates of the overvaluation of sterling run as high as 25 per cent. Such estimates are themselves probably lower bounds given the strong *ceteris paribus* assumptions underlying p. p. p. calculations, in particular no change in economic structure of which both Britain's loss of overseas assets and the 1919 squeeze on profits are examples.

If the inter-war gold standard system started out with large over and under-valuations as implied by more recent work, one would expect that the pressure for adjustment would be substantial. The behaviour of relative prices, rates of unemployment, reserve accumulations and rates of capacity utilization all suggest that such pressures existed. Although my earlier evidence (1972, 117-20) suggested only some slight convergence of prices and costs towards ‘equilibrium’, the recent work of Dimsdale (1981) and Redmond (1984) suggests more convergence in some areas, but given the latter's starting point it is nevertheless clear that the inter-war gold standard period was characterised by significant and sustained disequilibria. The fact that these disequilibria remained is probably the best place to begin one's examination of the inter-war gold standard. One should note in passing that this point of departure is significantly different in itself from that normally used for the pre-1914 regime.

With the existing disequilibria, the next question is how the burdens of adjustment were distributed. This question did not play an important part in any of the national decisions to return although arguments about burden-sharing were subsequently a part of international discussions. Perhaps the best place to begin is with the adherence or non-adherence of inter-war central bankers to the ‘rules of the game’. Ever since Nurkse's classic 1944 study, it has been agreed that on his activist interpretation of the rules where central banks actively reinforce the effects of reserve flows on the domestic credit base, that the inter-war norm was non-observance. In fact, non-observance was

more common during 1925-31 than during his whole sample period, although there was a declining trend (Moggridge 1987). Subsequently Bloomfield (1959) showed that the inter-war period was broadly similar to that before 1914 as regards the incidence of violations, but we lack any comparative indication as to the size of violation for the two periods. Moreover, even with a system of violations, there could be those with stabilising or destabilising implications.

Let us begin with an example of potentially stabilising violations of the rules. As I showed in some detail in 1972 (147-53) and as Barry Eichengreen (1985) claimed to ‘adequately document’ for the first time, the Bank of England violated the rules of the game. Yet it did so in a manner which I would argue was potentially stabilising. The Bank’s reactions to reserve flows typically saw it offsetting the domestic effects of most of any inflow by sales of open market assets whilst when reserve losses occurred it allowed much less offsetting and even reinforced reserve losses if they occurred in the first quarter of the year when sterling was normally seasonally strong. On average, periods of reserve loss saw a decline in the Bank’s domestic assets and rising interest rates, while periods of reserve gain saw falling interest rates and little or no change in domestic assets, although the Bank was more reluctant to lower interest rates when reserves were rising than it was to raise them when reserves fell. Such a set of responses would seem at least appropriate for a central bank managing an overvalued currency which, more often than not, was weak on exchange markets (Morgenstern 1959, Table 37). It allowed the Bank to maintain a restrictive stance and maintain generally deflationary pressure on the economy. The important question is whether the Bank’s policy should have been more restrictive even though this would, in the case of reserve inflows, involved a more substantial violation of the rules.

Then there are the cases of France and the United States. From her *de facto* stabilisation until the end of the gold standard as the normal international regime in September 1931, France’s stock of international reserves more than quadrupled. Over the same period, the Bank of France’s note issue and private deposits rose by 62 and 370 per cent respectively, but their combined total less than doubled. The explanation for these differences lies in changes in other items in the Bank’s balance sheet. The Bank’s advance to the Government fell from 36 billion francs to zero as a result of revaluation profits at the time of formal stabilisation in 1928, budget surpluses and sales of securities. The cash management policies of the savings banks and the debt management policies of the Treasury and other official agencies effectively immobilised further portions of the rise in the Bank’s liabilities. The result was the same as if the Bank had undertaken substantial open market operations to neutralise the reserve inflows but the causes of the practice were outside its immediate control. The Bank’s statutes, themselves a reflection of France’s inflationary experience up to 1926, meant that the Bank could do little to offset the ‘automatic’ neutralisation (Eichengreen 1986; Balogh 1930; Hawtrey 1932). This institutional neutralisations, in the context of a rising demand for money after the end of

the post-war inflation and rapid economic growth combined with the existence of substantial overseas balances after an earlier period of capital flight, resulted in further rises in reserves as overseas assets were realised to finance domestic activity (Balogh 1930, 449-50). The result was that France's adjustment from its undervalued exchange rate was slower than it would otherwise have been and that she became a 'reserve sink', albeit an occasionally co-operative one, with important implications for the working of the system.

During the 1920s, the United States was in such a strong International economic position that the Federal Reserve System could ignore gold movements in determining domestic monetary policy. In fact, the authorities' major concern was reducing the reserve ratio without monetary expansions. Throughout the period of the inter-war gold standard as the International system there was no relationship between gold movements and the stock of high-powered money as the authorities pursued domestic ends. Foreign considerations were rarely, if ever, important in themselves as determinants of policy except when foreign needs provided additional justifications for pursuing policies already chosen on domestic grounds (Friedman and Schwartz 1963, ch. 6; Chandler 1958; Wicker 1986; Clarke 1967; Chandler 1971). When the United States lost reserves the resulting sterilisation policies aided international adjustment, but the generally conservative stance of policy normally shifted the burden of adjustment firmly overseas, especially from early 1928 when American reserves began to rise.

The policies pursued by the Bank of France and the Federal Reserve System, coupled with the limited deflationary impact of that of the Bank of England, meant that the adjustment mechanism at the core of the system was more or less jammed for most of the inter-war gold standard period. With tendencies towards adjustment much less powerful and pervasive than would otherwise have been the case, reserve asset flows were larger than otherwise with important implications for the question of global reserve adequacy.

Table 1 presents figures for international reserves for seven European countries and the United States as well as totals of official gold holdings for the rest of the world for 1913, 1925, 1928, 1930 and 1931. Between 1913 and 1925, the changes in official gold reserves were dominated by the gold concentration policies followed by countries during and after the war. After 1925, new gold supplies were the overwhelming source of accretions to official reserves, although the figures also pick up the rise and subsequent collapse of the gold exchange standard in Western Europe.

Central banks and other official agencies in the 1920s, as before and afterwards, held reserves of internationally acceptable means of payment for a number of reasons: to finance payments imbalances, to show financial strength (including the 'backing' of currencies and banking systems) and to provide insurance against the breakdown of the existing payments system (including the traditional 'war chest') (Cooper 1970). To ascertain whether the supply of international liquidity

required to meet these general needs in the context of the inter-war gold standard was greater or less than the actual supply is more difficult than simply stating the determinants of the need for reserves. Contemporaries discussed the question extensively without reaching any agreement before the collapse of the international gold standard and the depreciations of currencies against gold so raised mine output and, along with the slump, stimulated Eastern dishoarding as to make the matter academic.

The best way to begin organising our own thinking is to look at the effects of the war and subsequent reconstruction periods on the supply of and demand for reserve assets. On the supply side, the rise in the world price level after 1914 in the face of a fixed nominal price for gold affected gold production which peaked in 1915, declined by 42 per cent between 1915 and 1922 and then stabilised at about 80 per cent of its 1915 level. Against this the removal of gold coins from circulation and the concentration of bankers' gold holdings in central bank reserves increased the proportion of current supplies available for central bank reserves, even after allowing for the increased non-monetary use of gold encouraged by its relative fall in price. In addition, the better recognition, especially after the 1922 Genoa Conference, of the reserve-increasing possibilities of the gold exchange standard offered another means of increasing reserve supplies. However, given the usual incentives for such practices that did exist, the possible additional gains here were not at all that great except in cases where the Genoa Resolutions and the activities of the Financial Committee of the League of Nations made changes in central bank statutes easier (Nurkse 1944, 17- 30-1). Finally, the rise of active central bank co-operation, increased private market stabilisation loans and, later, the creation of the Bank for International Settlements increased the availability of borrowed reserves, always a possible substitute for owned reserves.

Several factors at the same time working to increase the need, and often the demand, for international reserves. The rise in the world price level raised the size of nominal balance of payments imbalances. The post-war inflations and currency disorders resulted in an increased emphasis on 'confidence' and outside North America led to a rise in statutory cover requirements for note issues and other central bank liabilities (League of Nations 1930, Annex XIII, 96). The same experiences also raised the size of potential balance of payments imbalances by decreasing confidence in monetary institutions and exchange rates and increasing the potential for destabilising hot money movements. The increased number of separate nations and monetary authorities also raised the demand for reserves by reducing the economies of pooling and making economies less diversified. Any increased concern for domestic economic stability also increased the demand for reserves that would allow the authorities to 'buy time' and ride out potentially reversible payments difficulties without marked changes in domestic policies. As the cyclical parallelism amongst the major countries decreased after 1919 (Morgenstern 1959) the possibilities of dilemma cases where the authorities

might have to choose between internal and external balance also increased, also raising the need for reserves even if central bankers' concerns over domestic stability had not increased. All in all, the post-war changes in circumstances probably increased the need and demand for reserve assets by more than the supply, although as yet we lack any modern systematic empirical confirmation of such a hunch.

With these considerations in mind, we can return to the numbers in Table 1. The most commonly used index of reserve adequacy at both the national and international levels have been the ratio of owned reserves to imports. Such a measure has been subject to numerous theoretical objections (Niehans 1970, 58-60; Williamson 1973, 688-90), but there is also some agreement in the literature that the need for reserves would grow with the value of trade, even if there are doubts that the relationship would be strictly proportional. If one compares reserve/import ratios for the 1920s with those for 1913 using the central gold reserve figures in Table 1 as the appropriate ones for reserves, one would find that the ratio rose from 23 per cent in 1913 to an average of 28 per cent between 1925 and 1928. If one allows for the existence of the monetary gold stocks outside central banks in 1913 which had largely disappeared in the 1920s, this increase of over 20 per cent is less impressive as a substantial proportion of the increase came from reserve centralisation policies. On the other hand, the ratio of foreign exchange reserves to gold reserves rose above the pre-war level after 1925 (Lindert 1969, 13-15). Overall, the ratio of reserves to imports probably rose significantly between 1913 and the later 1920s. Assuming that reserves were adequate in 1913 - and the literature has not suggested global reserve inadequacy as a problem at the time - it is probable that stocks of international reserves were adequate in the late 1920s, even allowing for the factors which, on balance, had increased the demand for reserves.

Table 1

International Reserves – Selected Countries – 1913, 1925, 1928, 1930 and 1931^(a) – US\$ m^(b)

	1913		1925		1928		1930		1931	
	Central Gold ^(c)	Central Other ^(d)	Gold	Other ^(c)	Gold	Other ^(c)	Gold	Other ^(c)	Gold	Other ^(c)
Unites States	1290	0	3985	0	3746	0	4225	0	4092	0
United Kingdom	165	0	695	24	744	87	715	111	584	87
France	679	127	711	13	1254	1287	2099	1027	2699	842
Germany	279	115	288	243	650	126	528	182	234	0
Belgium	48	89	53	6	126	79	191	135	354	0
Netherlands	61	10	178	99	175	88	171	99	357	35
Sweden	27	45	62	54	63	105	65	105	55	13
Switzerland	33	13	90	43	103	48	138	48	388	19
Total	2582	399	6062	482	6861	1773	8132	1743	8763	996
World Total	4839		8997		10057		10844		11323	
Rest of World Total	2257		2935		3196		2812		2560	

Notes: (a) All figures for end of year;

(b) Gold valued at US\$ 20.67 per ounce;

(c) Central gold – holdings of central banks and governments;

(d) Foreign exchange and silver valued at market prices.

Source: Moggridge 1987.

Despite the improved ratio in the late 1920s there might still have been problems. Two questions I will not pursue here are likely trends in the rate of growth of such assets and the whole matter of whether the composition of assets created matched national demands. Both were potential problems in the late 1920s. However, leaving these to one side, the global level of reserves might not have seemed adequate to most members of the system if the distribution of reserves did not match perceptions of national needs (Cooper 1970, 132-5). Between 1913 and the mid-1920s the share of aggregate gold reserves held by the United States, already a high absorber before 1913 (Keynes 1983, XII, 747-9) rose by two-thirds. The rise in American gold reserves over this period exceeded world output of new gold available for monetary purposes and only the withdrawal of gold coin from circulation and other measures of gold concentration allowed others' reserves to rise. Outside the United States, reserve/import ratios fell. Between 1925 and 1928 the position of the rest of the world improved somewhat, as the U.S. gold stock fell and those of the other major creditors – Britain, the Netherlands, Sweden and Switzerland – rose by less than the American decline. This decline in creditors' absolute gold holdings, combined with the spread of the gold exchange standard, allowed a wider dispersion of reserve assets elsewhere. However, from early 1927 in terms of foreign exchange and later in the year in terms of gold France began to accumulate reserves on a large scale and after its mid-1927 difficulties in realising its sterling assets to concentrate its accruals in gold. These accruals were large in terms of new supplies of such assets. When coupled with the beginnings of large reserve flows to the United States in the second half of 1928, they began to put substantial pressure on the reserve positions of other countries. This pressure increased after the end of 1928 and they were substantial. As French gold accumulations alone exceeded supplies of new monetary gold and as Belgium, the US, the Netherlands, Switzerland and Sweden were also accumulating gold, the gold reserves of the rest of the world fell by 15.8 per cent between 1928 and 1930 and a further 24.4 per cent in 1931. It is not surprising that a revival of discussions on the adequacy of international reserves coincided with the decline, for even before there was a significant unwinding of the gold exchange standard the distribution of international liquidity was such that the majority of participants in the international monetary system could not be secure in the knowledge that their supplies were likely to be adequate in the medium term. Liquidity problems played a significant role in unleashing the deflationary forces which produced a collapse of the inter-war gold standard, even if one allows a significant independent role to the deflationary forces unleashed in the United States after the middle of 1929 and their transmission over the exchanges to the rest of the world. They were larger than anything the system had experienced in the heyday of the pre-war system and probably comparable in degree only to the deflationary pressures caused by the original spread of the standard amongst the centre countries in the 1870s. However, again there is no modern comparative research to sustain or reject this latter hypothesis.

The mention of the 1929 slump in the United States provides another candidate in standard catalogues of reasons for the collapse of the inter-war gold standard – larger or more sustained shocks to the system. Here, I think, that the discussion is somewhat imprecise. It is true, as Barry Eichengreen (1985; 24) has pointed out that we lack – and it might not be possible to devise – a metric to compare the relative sizes of shocks. Nevertheless, even before 1914, when the United States was not playing such a central role in the system, she was a significant source of disturbances, while Britain at the centre was, as I have argued above, not a major source of difficulties. Even if the American economy was no more unstable in the inter-war period than it had been before 1914 and no more a relatively high absorber of gold than before, her shifting to a central role in the system coupled with Britain's relative decline would have increased the potential instability of the system. Moreover, even if the size of pre and inter-war shocks was the same, there might have been different consequences from any shock because the robustness of the system or policy-makers' preferred trade-offs had changed. To take the robustness point first, it is far from clear, given the way that the system was operating before 1929, that it could successfully cope with severe stress. Even by that stage, the system was extremely fragile. Britain was in almost perpetual difficulties – that were so severe that on more than one occasion Governor Norman had doubts about her ability to remain on the gold standard. At the same time, Germany was heavily dependent on foreign borrowing, increasingly at short term, to pay her way internationally, the United States was primarily preoccupied with domestic matters and the gold exchange standard itself was at risk, especially as French official holdings of sterling became virtually unusable after the middle of 1927. Such economic fragility at the centre probably differs in degree from that of the pre-war world.

Moreover, policy-makers had probably altered their trade-offs between internal and external stability. It would certainly seem clear from the British documentary evidence that this was the case (Sayers 1976, I, esp. 212-3). In the United States the activities of the Federal Reserve System reflected the same shift in preferences. However, as yet, there is no comparative statistical evidence as to the exact extent of the shift in policy preferences. It is true, for example, that violations of the rules of the game were as common in the later period as in the earlier (Bloomfield 1959, 50), but no comparative study of the relative magnitude of the violations, as compared with their frequency, over the two periods has been attempted. Such a study would begin to help us to get a grip on the policy preferences issue. Yet even if preferences had changed, one must remember that despite such changes, policy-makers' willingness to impose or reinforce deflationary pressures their domestic economies for balance-of-payments reasons remained substantial. All one needs to consider British behaviour in the summer of 1931 or German policy up to the fall of Brüning. Both may not have been successful in their object – nor were the post-1931 French attempts in the same direction – but they were certainly significantly deflationary – probably more so than any deliberate policies undertaken in the same

countries before 1914 when policy-makers were supposedly more willing to make such choices.

It is probable that there was no increase in market integration between the pre-1914 and inter-war international economies (Friedman and Schwartz 1982, 290-2; Friedman 1984, 158-9), despite some suggestions to the contrary (Eichengreen 1985, 23). Indeed, one of the major concerns of policy in the 1920s was the attempt to reverse the international economic disintegration that had resulted from the War, even though, on occasion, some were beginning to make halting, and occasionally not very effective, attempts to reduce inter-market connections (Moggridge 1972, ch. 9). Nevertheless, conditions were probably more volatile. The pre-1914 gold standard world had seen examples of hot money movements, for wars, threats of war, revolutions, banking collapses and threats to the maintenance of the gold standard were not unknown (Bloomfield 1963, ch. V). The inter-war world's inhabitants had, however, lived through far more traumatic events than those whose experience had spanned the three or four decades before 1914. The effects of these wartime and early post-war experiences were certainly crucial for many countries in the 1930s. All one needs to confirm this are the role of French experience in the 1920s in shaping attitudes and policy in the 1930s (Jackson 1985) or the role of the German hyperinflation in conditioning possible responses to the difficulties after 1929 (James 1986, 389-90). Thus, for a given disturbance to 'confidence' during the inter-war gold standard period, it is likely that hot money flows would have been larger than before the war, something that Morgenstern's, albeit imperfect, indices of stress bring out clearly (1959, Ch. VII). If, as Eichengreen has pointed out (1985, 24), market makers also believed that policy-makers preferences had changed on the matter of internal versus external balance, capital flows might also have become more volatile.

Offsetting, at least to some extent, the greater fragility and volatility of the inter-war system was the rise of central bank co-operation. Before 1914, in the case of the Bank of England, 'neither Governors or officials made any visits to other countries on official business and visitors to the Bank from other countries were ordinarily paying only courtesy visits' (Sayers, 1976, I, 8). This was hardly the case during the inter-war period and by the end the practice of regular central bankers' meetings had become institutionalised with the Bank for International Settlements. Moreover, there were instances where central bank co-operation kept the system working such as the American, British, French and German meetings of 1927, the Federal Reserve's support for sterling in the summer of 1929 and the American and French support for sterling in the Fall of 1930 (Clarke 1967). Yet as time passed such co-operation became harder to achieve as the French, who had always held the view, were joined by the Americans in the belief that adjustment by deficit countries such as Britain was ultimately necessary – a view which the British were more inclined to press on others than practice themselves. Yet even in these circumstances there was the co-operative attempt to save the system in 1931. In the process, substantial support was mobilised – roughly US\$1 billion or 10 per cent of

international short-term indebtedness or just over 5 per cent of the value of world imports in 1931 (Moggridge 1982, 182). This was the first time that the international central bank community had ever managed to co-operate extensively in the face of a major crisis. Inevitably co-operation was less efficient or perfect than it might have been. Those involved were often hesitant because they were uncertain as to the extent of the problem. There were political complications, constraints imposed by the domestic financial crisis in the United States and ineptitudes such as the Bank of England's attempt to use the European crisis, when speed was of the essence, as an excuse to embark on a discussion of international monetary reform. Opinions differ as to whether the system in 1931 might (or should) have been held together by a lender of last resort (Kindleberger 1986, 289-91), but substantial co-operation did occur, even though it had its flaws.

Even though central-bank co-operation played a role in preserving the inter-war gold standard system, there is also another side to the coin. Some of the disequilibrating strains to which the system was subject were themselves products of the same co-operation. Central bank co-operation helped ease sterling back to gold – and over-valuation – in 1925. Co-operating central bankers encouraged Belgium to undervalue her exchange rate in 1926 (Meyer 1970, 37; van der Wee and Tavernier 1975, 111-12; Sayers 1976, I, 191-3) and did not strongly discourage the deliberate Italian overvaluation of 1927 (Mayer 1970, Ch. 3; Cohen 1972). Indeed, it is not clear from the evidence where on balance one would place the net effects of co-operation in the working of the inter-war gold standard.

One could go on to other explanations of reasons for the failure of the inter-war gold standard – the shift from a sterling-dominated, London-centred system to the post-1920 multi-centred system (Brown, 1940), the decline in wage and price flexibility, rising trade barriers and the like. However, most of these are either relatively minor matters of degree or actually fly in the face of contrary evidence. Moreover, it is probably more important that we should not lose the basic themes underlying much of the previous discussion. The inter-war gold standard worked less successfully than its predecessor because it had to cope with larger disequilibria – and perhaps larger shocks. These larger disequilibria were in many respects built into the system from the outset as a result of the uncoordinated, piecemeal way in which countries returned to the standard after the massive disruptions of the War and early post-war period. These disequilibria were almost certainly exacerbated by subsequent policies. The adjustment mechanism did not work very well and, as always, there were disagreements as to who should bear the burdens, these not helped by differing perceptions, often resulting from the same post-war experience, of the relative costs of various alternative policies.

Whether or not those responsible for policy in the inter-war period could have done better is another question. Of course they could have done so in theory – always available to economists – or with hindsight – always available to historians. Certainly some contemporary critics believed that

matters could have been better handled. Yet one must remember that those responsible for policy in the 1920s did not have previous experience of building or reconstructing a system. Many of their successors after the next world war had such experience. They had a clear impression of the ‘lessons of history’ (Keynes 1980, XXV, 21-3, 27-30). In the end they succeeded to a greater extent than their predecessors, even though they made mistakes and events did not proceed as foreseen. Perhaps their major difference from their predecessors was a willingness to try again. But this is another story.

In conclusion, it would be helpful to summarise the main points of discussion:

1. Despite over fifty years of worrying about the problem, we still do not know how the pre-1914 gold standard worked in practice. Obviously it was ‘successful’ in the long run but we do not know why. Even in the short to medium term, where the discussion has been more extensive, particularly as regards Britain, there are still large gaps in our knowledge and at least one common hypothesis that follows from what we do know about behaviour at the centre which seems to be inconsistent with the evidence – the shifting of the burden of adjustment to the periphery. There is certainly more work to be done in piecing the story together in the round and in national detail.
2. Because we do not fully understand how the pre-1914 gold standard worked, we have problems in explaining why the inter-war gold standard failed. Yet even where we have hypotheses, we often lack the material for anything other than impressionistic and non-quantitative comparisons. Even where we do have the quantitative basis for comparisons, they frequently tell us more about the relative frequencies of phenomena rather than their relative magnitudes. Yet without both kinds of information, systematic comparison is impossible.

Thus, despite volume of the literature and the vast increase in our knowledge over the last thirty years, there is room for several substantial research projects.

Bibliography

- Balogh, T. 1930, "The Import of Gold into France: An Analysis of the Technical Position", *Economic Journal*, 40 (September) 442-60.
- Bloomfield, A. 1959, *Monetary Policy Under the International Gold Standard, 1880-1914*, Federal Reserve Bank of New York.
- Bloomfield, A. 1963, "Short-Term Capital Movements Under the Pre-1914 Gold Standard", *Princeton Studies in International Finance*, 11.
- Bordo, M. D. 1984, "The Gold Standard: The Traditional Approach", in Bordo & Schwartz.
- Bordo, M. D. & Schwartz, A. J. (eds.) 1984, *A Retrospective on the Classical Gold Standard*, Chicago: University of Chicago Press.
- Brown, W. A. Jr. 1940, *The International Gold Standard Re-interpreted, 1914-1939*, New York: National Bureau of Economic Research.
- Butlin, N. G. 1964, *Investment in Australian Economic Development, 1861-1900*, Cambridge: Cambridge University Press.
- Chandler, L.V. 1958, *Benjamin Strong: Central Banker*, Washington: Brookings Institution.
- Chandler, L, V. 1971, *American Monetary Policy, 1928-1941*, New York: Harper and Row.
- Clarke, S. V. O. 1967, *Central Bank Cooperation, 1924-1931*, Federal Reserve Bank of New York.
- Cohen, J. S. 1972, "The 1927 Revaluation of the Lira: A Study in Political Economy", *Economic History Review*, 2nd Ser. 25 (November), 642-54.
- Cooper, R. N. 1970, "International Liquidity and Balance of Payments Adjustment in International Monetary Fund 1970.
- Cooper, R. N. 1982, "The Gold Standard: Historical Facts and Future Prospects", *Brookings Papers on Economic Activity*, 1, 1-45.
- Dimsdale, N. H. 1981, "British Monetary Policy and the Exchange Rate 1920- 1938" in W.A. Eltis and P. J. N. Sinclair (eds.) *The Money Supply and the Exchange Rate*, Oxford: Clarendon Press.
- Dutton, J. 1984, "The Bank of England and the Rules of the Game Under the International Gold Standard: New Evidence", in Bordo and Schwartz (eds.).
- Edelstein, M. 1982, *Overseas Investment in the Age of High Imperialism: The United Kingdom, 1850-1914*, New York: Columbia University Press.
- Eichengreen, B. J. (ed.) 1985, *The Gold Standard in Theory and History*, London: Methuen.
- Eichengreen, B. J. 1986, "The Bank of France and the Sterilisation of Gold, 1926-1932", *Explorations in Economic History*, 23 (January) 33-35.
- Eichengreen, B. J., Watson, M. W. and Grossman, R.S. 1985, "Bank Rate Policy Under the Interwar Gold Standard: A Dynamic Probit Model", *Economic Journal*, 95 (September), 725-45.
- Ford, A. G. 1962, *The Gold Standard, 1880-1914: Britain and Argentina*, Oxford: Clarendon Press.
- Friedman, M. 1984, "Comment on McCloskey and Zecher" in Bordo and Schwartz (eds.).
- Friedman, M. and Schwartz, A. J. 1963, *A Monetary History of the United States, 1867-1960*, Princeton: Princeton University Press.
- Friedman, M. 1982, *Monetary Trends in the United States and the United Kingdom: Their Relation to Income, Prices, and Interest Rates, 1867-1975*, Chicago: University of Chicago Press.

- Fritsch, W. "1983", *Aspects of Brazilian Economic Policy Under the First Republic, 1889-1930*, unpublished, Cambridge University Ph.D. dissertation.
- Goodhart, C. A. E. 1972, *The Business of Banking, 1891-1913*, London: Widenfeld and Nicolson.
- Hawtrey, R. G. 1932, *The Art of Central Banking*, London: Longmans.
- Hawtrey, R. G. 1938, *A Century of Bank Rate*, London: Longmans.
- Hodgson, J. S. 1972, "An Analysis of Floating Exchange Rates: The Sterling-Dollar Rate, 1919-1925", *Southern Economic Journal* 39, 249-57.
- International Monetary Fund 1970, *International Reserves: Needs and Availability*, Washington.
- Jackson, J. 1985, *The Politics of Depression in France, 1932-1936*, Cambridge: Cambridge University Press.
- James, H. 1986, *The German Slump: Politics and Economics, 1924-1936*, Oxford: Clarendon Press.
- Jonung, L. 1984, "Swedish Experience Under the Classical Gold Standard 1873-1914", in Bordo and Schwartz (eds.).
- Keynes, J. M. 1971-83, *The Collected Writings of John Maynard Keynes* (eds. E. Johnson and D. Moggridge), 29 volumes, London: Macmillan.
- Kindleberger, C. P. 1986, *The World in Depression 1919-1939*, 2nd ed., Berkeley: University of California Press.
- League of Nations 1930, Gold Delegation, *First Interim Report*, Geneva.
- Lindert, P. H. 1969, "Key Currencies and Gold 1900-1913", *Princeton Studies in International Finance*, 24.
- Lipse, R. G. 1984, "Comment on McCloskey and Zecher" in Bordo and Schwartz (eds.).
- Maddison, A. 1982, *Phases of Capitalist Development*, Oxford: Oxford University Press.
- Maizels, A. 1963, *Industrial Growth and World Trade*, Cambridge: Cambridge University Press.
- Matthews, R. C. O., Feinstein, C. H. and Odling-Smee, J. C. 1983, *British Economic Growth 1856-1973*, Stanford: Stanford University Press.
- Matthews, K. G. P., "Was Sterling Overvalued in 1925?", *Economic History Review*, 2nd Ser. 39 (November), 572-88.
- McCloskey, D. N. and Zecher, J. R. 1976, "How the Gold Standard Really Worked 1880-1913", in J. A. Frenkel and H. G. Johnson (eds.), *The Monetary Approach to the Balance of Payments*, Toronto: University of Toronto Press.
- McCloskey, D. N. and Zecher, J. R. 1984, "The Success of Purchasing-Power-Parity: Historical Evidence and its Implications for Macroeconomics", in Bordo and Schwartz (eds.).
- Meyer, R. H. 1970, *Bankers' Diplomacy: Monetary Stabilization in the Twenties*, New York: Columbia University Press.
- Moggridge, D. E. 1969, *The Return to Gold, 1925: The Formulation of Economic Policy and its Critics*, Cambridge: Cambridge University Press.
- Moggridge, D. E. 1972, *British Monetary Policy, 1924-1931: The Norman Conquest of US\$ 4.86*, Cambridge: Cambridge University Press.
- Moggridge, D. E. 1982, "Policy in the Crises of 1920 and 1929", in C. P. Kindleberger and J. P. Laffargue (eds.) *Financial Crises: Theory, History and Policy*, Cambridge: Cambridge University Press.
- Moggridge, D. E. 1987, "The Gold Standard and National Financial Policies 1919-1939" in P.

- Mathias and S. Pollard (eds.), *The Cambridge Economic History of Europe*, VIII, Cambridge: Cambridge University Press.
- Morgenstern, O. 1959, *International Financial Transactions and Business Cycles*, Princeton: Princeton University Press.
- Niehans, J. 1970, "The Need for Reserves of a Single Country" in International Monetary Fund, 1970.
- Nurkse, R. 1944, *International Currency Experience*, Princeton: League of Nations.
- Pesmazoglu, J. S. 1951, "A Note on the Cyclical Fluctuations of British Home Investment, 1870-1913", *Oxford Economic Papers*, N. S., 3 (February), 39-61.
- Phelps Brown, E. H. and Browne, M. H. 1968, *A Century of Pay*, London: Macmillan.
- Redmond, J. 1984, "The Sterling Overvaluation in 1925: A Multilateral Approach", *Economic History Review*, 2nd Ser. 37 (November), 520-32.
- Rich, G. 1984, "Canada without a Central Bank: Operation of the Price- Specie-Flow Mechanism, 1872-1913", in Bordo and Schwartz (eds.).
- Sayers, R. S. 1976, *The Bank of England, 1891-1944*, 3 vols., Cambridge: Cambridge University Press.
- Simkin, C. G. F. 1951, *The Instability of a Dependent Economy: Economic Fluctuations in New Zealand, 1840-1914*, Oxford: Clarendon Press.
- Thomas, B. 1973, *Migration and Economic Growth*, 2nd ed., Cambridge: Cambridge University Press.
- Tinbergen, J. 1951, *Business Cycles in the United Kingdom, 1870-1914*, Amsterdam: North Holland.
- Triffin, R. 1947, "National Central Banking and the International Economy" in L. G. Metzler, R. Triffin and G. Haberler, *International Monetary Policies*, Washington: Federal Reserve Board.
- Triffin, R. 1964, "The Evolution of the International Monetary System: Historical Reappraisal and Future Perspectives", *Princeton Studies in International Finance*, 12.
- Van der Wee, H. and Tavernier, K. 1975, *La Banque National de Belgique et L'Histoire Monetaire entre les Deux Guerres Mondiales*, Brussels: Banque Nationale de Belgique.
- Wicker, E. R. 1966, *Federal Reserve Monetary Policy, 1917-1933*, New York: Random House.
- Williamson, J. 1973, "International Liquidity: A Survey", *Economic Journal*, 83 (September), 668-746.
- Yeager, L. B. 1976, *International Monetary Relations: Theory, History, Policy*, 2nd ed., New York: Harper & Row.