

Monetary Policy Cooperation and Coordination

*An Historical Perspective on the
Importance of Rules*

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1. Introduction

Events since the financial crisis of 2007–2008 have led to renewed interest in monetary policy cooperation and coordination (Frankel 2015). While the reintroduction of the Federal Reserve’s swap lines with major advanced country central banks in September 2008 and coordinated policy rate cuts announced at the G20 Summit in October 2008 attracted praise, claims of ‘currency wars’ by central bankers from emerging countries following quantitative easing by the Fed and later by the Bank of Japan and the European Central Bank (ECB) have led to calls for monetary policymakers to take coordinated action to reduce the international spillover from their domestic actions (Eichengreen 2013b). An alternative view argues that the externalities from recent monetary policy actions reflects the deviation from rules-based monetary policy (Taylor 2013; Ahrend 2010; Bordo and Landon-Lane 2012). By a rules-based policy what is meant is that the central bank sets its policy instrument (in the United States, the federal funds rate) in a predictable way in reaction to its primary policy goals: the deviation of real growth from potential and the deviation of inflation from its target. In this

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view, a return to rules-based monetary policy and a rolling back of the “global great deviation” by each country’s central bank would lead to a beneficial global outcome without the need for policy coordination.

This paper reviews the issue of monetary policy cooperation and coordination from an historical perspective. We examine the experiences of cooperation and coordination since the late nineteenth century among advanced countries across several exchange rate regimes: the classical gold standard, 1880 to 1914; the interwar gold exchange standard, 1924 to 1936; the Bretton Woods system, 1944 to 1973; and the Managed Float, 1973 to the present. We distinguish between cooperation and coordination, although the distinction in reality is pretty murky. By cooperation we mean the sharing of information and techniques of central banking, the discussion of common problems and occasional/ad hoc emergency lending or other operations between central banks in periods of financial crisis. By coordination we mean policy actions formally agreed upon and taken by groups of policymakers (including finance ministers and central bankers) aimed at achieving beneficial outcomes for the international system as a whole. Such actions may conflict with domestic policy goals. To conserve on space, we limit ourselves to monetary policy actions, including some cases of lender of last resort. We also avoid the vast example of monetary policy cooperation and coordination leading to the creation of the European Monetary Union, and we only tangentially discuss the growing role of the emerging countries, especially China, in the international monetary system.

In this paper we argue that, in monetary regimes that are rules based (in the sense of the modern literature on rules versus discretion), cooperation was most successful and less so in regimes based on discretion or poorly grounded rules. We find less success for more elaborate schemes of coordination.

2. The classical gold standard, 1880 to 1914

The classical gold standard was the original rules-based monetary policy regime (Bordo and Kydland 1995). The basic rule for each monetary authority was to maintain convertibility of its paper currency in terms of gold at the official nominal price (or as a fixed number of ounces of gold). This required subsuming domestic policy goals to the dictates of external balance (except in the case of a banking panic). In fact, monetary authorities with credibility had some limited flexibility to attend to domestic stability goals within the gold points that bounded the official parity (Bordo and Macdonald 2005).

The gold standard was a rule in the modern (Kydland and Prescott 1977) sense. Adhering to the convertibility rule was a credible commitment mechanism to prevent the monetary authorities from following time inconsistent discretionary policies. The gold standard rule was also a contingent rule. Convertibility could be suspended in the event of well understood emergencies such as a major war or a financial crisis not of the domestic authority's own making (Bordo and Kydland 1995). In such circumstances the monetary authority could issue fiat money on the understanding that it would be retired once the war had ended. In the event of a financial crisis, a temporary suspension could allow the authority to provide lender of last resort liquidity.

Central banks in advanced countries before 1914 did consistently follow the convertibility rule. They also were supposed to adhere to the “rules of the game”—rules of thumb that they would use their discount rates to speed up the adjustment to external imbalances. In actual fact some countries did not strictly follow these “rules of the game” but engaged in sterilization and gold policy (policies to widen the gold export point) (Bordo 1981).¹

1. A prominent example of which was France. See Bazot, Bordo, and Monnet (2016). As discussed in Bloomfield (1959), many other countries also violated the “Rules”.

Cooperation during the gold standard was quite limited. To the extent that central banks adhered to the gold standard, they implicitly cooperated. Even the minor violations of the gold points that occurred were never sufficient to threaten the international monetary system. There is evidence that in the face of several large financial crises (for example, 1890 and 1907), the Banque de France, which had very large gold reserves, lent gold on commercial terms to the Bank of England to allow it to avoid suspending convertibility. Some argue that that this cooperation was essential to the survival of the gold standard (Borio and Toniolo 2005; Eichengreen 1992), but the evidence suggests otherwise (Flandreau 1997; Bordo and Schwartz 1999). The Bank of England held a “thin film of gold” because it had a long record of credibility, which ensured that capital flows would be stabilizing. Moreover, in financial crises that did not involve rescue loans, the Bank of England requested a “Treasury Letter” allowing it to temporarily suspend convertibility. When this happened, as in 1825 and 1847, the panic ended.

Several early unsuccessful attempts at international monetary coordination occurred at a number of conferences held to try to standardize gold coins across the major countries. In conferences held in Paris in 1867 and 1878, France tried to convince Great Britain and the United States to change the weights of their standard gold sovereign and gold eagle into that of the five franc gold coin. The idea was that having similar coins across the gold standard would reduce the transactions costs of international trade. The adjustments in weights for each currency were very minor, but the British and American opposition to such an infringement on their monetary sovereignty was overwhelming (Eichengreen 2013a; James 2016). Later in the century, at the height of the Free Silver movement, a number of international conferences were held in the United States to promote global bimetallism. Nothing came out of them.

The gold standard was successful because it was rules based and each member voluntarily adhered to the convertibility rule. Many

authors have argued that gold standard adherence was not enough to maintain the gold standard (see Bordo 1984). They argued that it was durable because it was managed by Great Britain, the leading commercial power. London was the center of the global financial system, and it housed the leading financial markets and commodity markets, and many international banks had headquarters there, or at least branches. The traditional view is that the Bank of England could draw “money from the moon” by raising its discount rate. Moreover, it was backed by the safe assets of the British Empire whose sovereign debt was guaranteed by the British government (Ferguson and Schularick 2012). Others argue that France and Germany were also key players in the gold standard and that implicit cooperation between them guaranteed the safety of the system (Tullio and Walters 1996).

Despite its success as a rules-based system, the gold standard collapsed because World War I completely unraveled the global financial system and virtually bankrupted all of the European belligerents. Had the war not happened, it could have lasted longer.

3. The interwar gold exchange standard, 1924 to 1936

After World War I, Great Britain, France, and other countries expressed a strong desire to restore the gold standard. The United States had never left gold; it just imposed an embargo on gold exports for two years after it entered the war in April 1917. All of the belligerents had financed their war efforts with a combination of taxes, debt, and seigniorage. All had large debt overhangs and high inflation. In Great Britain the price level more than doubled, in the United States it inflated somewhat less, in France it tripled, and in Germany it increased considerably more than that. The debt overhang and high inflation meant that it would be difficult for most countries to go back to the gold standard at the prewar parities, and most experts believed that it would take major international

cooperation and coordination to restore it. Two important conferences in Brussels (1920) and Genoa (1922) set the stage for the restoration of the gold standard. Because of a predicted gold shortage (the real price of gold had been vastly deflated by the global wartime inflation), it was to be a gold exchange standard under which members would hold both foreign exchange and gold as international reserves. Great Britain and the United States were to be the center countries of the new international monetary system, and they were to hold their international reserves in gold valued at the prewar parities.

Extensive international cooperation was required to stabilize the central European countries that had run hyperinflations. The stabilization packages were imposed by the League of Nations and private sector lenders such as JP Morgan in return for the loans required to build up the reserves needed to restore convertibility, which involved massive disinflation and budget balance. To facilitate Great Britain's return to gold in 1925, the New York Fed established a \$200 million line of credit for the Bank of England in New York (Bordo, Humpage, and Schwartz 2015, ch. 2). The Fed also kept its policy looser than would otherwise have been the case (Friedman and Schwartz 1963).

The interwar gold standard was based on the convertibility rule, as was its prewar ancestor, but the rule was more fragile and less credible. One key difference between the gold exchange standard and the classical gold standard was that few countries were perceived to be willing to maintain external balance at the expense of domestic policy goals. Because of the extension of the franchise in most countries, the growth of organized labor, and the fresh responsibilities of governments for the economic and social welfare of their populations after the terrible experience of war, more emphasis was placed on domestic output, employment, and price stability. Central banks began to focus more on stabilizing the business cycle in support of expansionary economic policy targets

for employment and growth (Polanyi 1944; Eichengreen 1992). In addition, many of the post–World War I parities were misaligned, reflecting miscalculation of equilibrium exchange rates and political pressures, together with some expectation that if the parity were changed it could be changed again, which expectation meant that a changed parity reduced credibility (Eichengreen 1992, ch. 6). Sterling was pegged to gold at an overvalued (prewar) parity in April 1925 while France went back in 1926 after an 80% devaluation, at a greatly undervalued parity. This meant that the adjustment mechanism of the gold standard was destined to malfunction (Meltzer 2003). The Bank of England had to continually tighten monetary policy to protect its gold reserves in the face of persistent balance of payments deficits, which continually deflated the British economy (Keynes 1925). At the same time, France ran persistent balance of payments surpluses, which should have led to an expansion in the money supply and inflation but instead were continuously sterilized. This meant that France was absorbing a larger and larger amount of the world's gold reserves (Irwin 2013). The United States kept sterilizing its surpluses, joining France in sucking gold from the rest of the world. In addition to the maldistribution of gold, the system was further weakened by failing confidence in sterling as a reserve currency. Declining gold reserves at the Bank of England and Federal Reserve sterilization policies prompted countries to shift their foreign exchange reserves from sterling to dollars (Eichengreen et al. 2017).

Against this background of flawed rules, considerable central bank cooperation was required just to prop up the system. Much of the cooperation was personal; between Montagu Norman, governor of the Bank of England, Benjamin Strong, governor of the Federal Reserve Bank of New York, Hjalmar Schacht, president of the Reichsbank, and Emile Moreau, president of the Banque de France (Clarke 1967; Ahamed 2009; James 2016). Norman and Strong worked tirelessly to get the gold standard working. Once

underway, the perennial problem of sterling's weakness came to the fore. It was aggravated by the Banque de France's pro-gold policy of converting sterling bills into gold. In July 1927 Strong organized a clandestine meeting between the four governors at the house of Undersecretary of the Treasury Ogden Mills on Long Island. At this meeting one of the classic monetary policy coordinations of all time was worked out to protect sterling. The New York Fed agreed to cut its discount rate and to conduct expansionary open market operations while the Banque de France (and the Reichsbank) agreed to shift their gold purchases from London to New York. The meeting was organized by Strong, and only one member of the Federal Reserve Board in Washington was present. Sterling was saved for another day, but the fallout from the meeting in the United States kept spreading. In 1931 at the peak of the Great Contraction, Adolph Miller, a governor of the Federal Reserve Board, blamed Strong's actions for fueling the Wall Street boom that burst in October 1929 and for creating the Great Contraction. His criticism was picked up by Parker Willis and Carter Glass and later by Herbert Hoover in his memoirs (Meltzer 2003). The episode eventually led to a major reform in the Banking Act of 1933, which stripped the New York Fed (and any other Federal Reserve bank) of any role in international monetary policy and gave full responsibility to the Federal Reserve Board. Moreover, Strong's actions bailing out Britain on two occasions may have encouraged moral hazard by discouraging the British from learning to adjust (Meltzer 2003). After Strong's death in 1928 and Schacht's departure from the Reichsbank, Norman pushed hard to institutionalize monetary policy cooperation, which came to fruition with the creation of the Bank for International Settlements (BIS) in Basel in 1930.

The initial operational purpose for the BIS was to manage German reparations after the Young Plan, but its more fundamental function was to promote central bank cooperation. It was a venue

for sharing information and provided a confidential forum for central bankers to meet on a regular basis as well as providing services for central banks (for example, gold swaps, deposits, and lines of credit) (Toniolo and Clement 2005; Borio and Toniolo 2005). But its early attempts at cooperation were not successful (James 2016). The BIS was involved in two failed attempts in spring and summer of 1931 to rescue the Austrian schilling and the German mark. Its resources were too small, and the rescues did not have the political backing of France.

The architecture of the interwar gold standard emphasized the importance of central banks for the exercise of monetary policy. The delegates at the Genoa International Economic Conference in 1922 explicitly stated that central bank cooperation was a vital aspect of a prospective new gold standard and that this should be institutionalized in a convention or “entente” (Schenk and Straumann 2016; James 2016). Montagu Norman promoted a network of central banks modeled on the Bank of England that could cooperate to deliver “orthodox” policies aimed at monetary and exchange rate stability. His vision was supported by the Financial Committee of the League of Nations, which sent missions to a range of central European states in the mid-1920s as part of creating a coordinated international monetary system. Sir Otto Niemeyer and others from the Bank of England toured emerging markets to advise on monetary policy, “sound money,” and to promote the establishment or reform of central banks. His advice was sometimes controversial, as, for example, in Australia where his recommendations of austerity to restore exchange rate stability were greeted with indignation (Attard 1992, 82). Many Western Hemisphere states looked to the United States; Edwin Kemmerer of the Federal Reserve Bank toured a number of countries from 1917 to 1931 advising on the organization of central banks, including Colombia, Chile, Ecuador, Bolivia, and Peru (Singleton 2011, 60). With the increased prominence of central banks and the establishment of the Bank for

International Settlements, the interwar gold standard (while itself a failure of cooperation and coordination) set the foundations for central bank cooperation for the next century.

The gold exchange standard collapsed amid the shocks of the Great Depression. Many argue that adherence to the gold standard caused the Great Depression because of “golden fetters”—due to the gold constraint, countries could not follow lender of last resort policies (Temin 1989; Eichengreen 1992), and because of the collapse of the global money supply gold multiplier (Bernanke 1995). Others argue that the Depression was caused by inappropriate Federal Reserve monetary policy (Friedman and Schwartz 1963; Meltzer 2003). The collapse in the US money supply was then transmitted to the rest of the world by the fixed exchange rate gold standard.

Two major attempts at monetary policy coordination were undertaken in the 1930s as the gold exchange standard collapsed, one a disaster and one quite successful. The League of Nations sponsored the London Monetary and Economic Conference in June 1933 to try to stabilize exchange rates and achieve concessions on trade restrictions. The planning for the summit was already in place when the United States abandoned its gold peg in April 1933, and the timing meant that there was little prospect for a successful outcome. The French were adamant about a return to gold but would not agree to reflate their economy to support the targets in Britain and the United States for recovery of prices, or to relax French trade restrictions (Eichengreen 1992). In the wake of this now traditional French unwillingness to cooperate, the British and American administrations opted firmly to prioritize their domestic goals for price stability. The United Kingdom turned to monetary and trade cooperation with the sterling bloc of countries pegged to the pound, the gold bloc centered on France bolstered its defenses, and the United States embarked on its own independent path.

Three years later, the timing was more propitious for successful cooperation under the Tripartite Agreement of 1936 between the United States, the United Kingdom, and France as the French position had become untenable when the dollar and sterling depreciated against gold. France needed a coordinated devaluation to prevent a free fall in the franc, and the United States and United Kingdom also had an interest in an orderly depreciation of the franc. With this coincidence of interest, it was possible to agree to a common strategy not to manipulate exchange rates for national advantage. Each country's Exchange Stabilization Fund (ESF) engaged in daily coordinated exchange market intervention to produce an orderly devaluation of the French franc. It ended at the outbreak of World War II (Bordo, Humpage, and Schwartz 2015, ch. 3).

Monetary policy cooperation and coordination certainly contributed to the interwar gold exchange standard's problems by propping up a flawed system and possibly even helping fuel the 1920s asset price boom. Central bankers were later blamed for the Great Depression and had their powers and independence stripped, with important consequences for the postwar period. Unlike the pre-war gold standard, although the gold exchange standard was rules based, the circumstances and implementation of the rules were flawed from the beginning. Central bank monetary policy cooperation and coordination did not function well in this environment.

4. The Bretton Woods international monetary system, 1944 to 1973

During the World War II, the Great Depression was characterized as a failure of coordination in international trade (protectionism) and also international monetary policy; US monetary policy mistakes spilled over to European economies, increasing the fragility of the global financial system. Thus, many have argued that destabilizing international short-term capital flows fueled competitive

devaluations and “currency wars” in the 1930s that led to further disintegration of the global economy via protectionist trade barriers and capital controls (Nurkse 1944; Kindleberger 1986). A key goal of the postwar period was therefore to create a framework for cooperation and coordination underpinned by credible rules to ensure a lasting and prosperous peace (Giovannini 1993). For monetary policy, the rules were to maintain pegged exchange rates within narrow bands (plus or minus 1%) supported by controls on short-term capital flows and access to short-term credit (from the International Monetary Fund) to cover temporary balance of payments imbalances. Unlike the interwar system, member countries could adjust their parities in the event of a “fundamental disequilibrium” (which was never defined). The gold convertibility rule was preserved through fixing the gold price of the US dollar at \$35 per ounce. Gold parities for other currencies were identified through the dollar. The cornerstone of the classical gold standard—convertibility—was restricted to current account transactions to promote multilateral trade and payments. Short-term capital flows were considered disruptive to cooperation and coordination and were sacrificed to enhance domestic monetary policy sovereignty in this solution to the Mundell-Fleming trilemma.

The history of the design of the Bretton Woods system is remarkable for the strong consensus that a return to a pegged exchange rate rule (and freer trade) was the best way to recapture the benefits of the nineteenth-century era of globalization under the gold standard. The general agreement on the appropriateness and effectiveness of the rule should have boded well for the success and credibility of the system, if every participant shared roughly the same tolerance for unemployment and inflation. But almost as soon as it started to operate as designed, it began to founder, requiring a series of repairs to keep it afloat.

In the immediate aftermath of the war, other systems of coordination were formed to allow multilateral trade without full con-

vertibility: the European Payments Union (EPU) and the Sterling Area were the two most prominent examples. The EPU provided monthly clearing for European trade payments from 1950 to 1958, with settlement increasingly in dollars and gold. The Sterling Area (the United Kingdom, the British Commonwealth—except Canada—all British colonies, and several Middle Eastern states) operated exchange controls in concert against the dollar, denominated most of their foreign exchange reserves in sterling, and enjoyed freer international capital flows from 1945 to 1958 (thereafter the coordination eroded) (Schenk 2010). These interim solutions allowed trade liberalization to fuel growth, and current account convertibility was finally introduced by most countries at the end of 1958.

But the convertibility rule proved inconsistent with domestic priorities of full employment and growth once international capital markets could no longer be contained. Offshore markets in London and current account convertibility in the 1960s tested the credibility of adherence to the exchange rate rule, and there were repeated parity adjustments that undermined the system as a whole. The pegged rate rule was operated too inflexibly, so, instead of small and frequent adjustments, there were repeated speculative rushes on the deutsche mark, franc, and pound sterling, in particular, through the 1960s. By the end of the 1960s, these attacks had spread to the dollar at the heart of the system, and the gold convertibility rule was effectively abandoned in March 1968.

The Bretton Woods system is an example of an elaborate effort at institutionalized coordination that failed because of fundamental flaws in the rules underpinning the system (Schenk 2016). Instead, a set of cooperative initiatives were deployed to prop the system up on an ad hoc basis until the convertibility and exchange rate rules finally gave way in 1973. This cooperation among leading industrial economies (promoted in part by Cold War ideology) allowed the global economy to reap the benefits of freer trade and

technological innovation during the first 30 years after the end of World War II so that the Bretton Woods era was characterized by low inflation and rapid growth (Bordo 1993).

The most serious vulnerability in the Bretton Woods rules arose from the use of the dollar as an international reserve currency, and therefore reliance on US monetary policy. The role of the dollar gradually polarized the main actors in the system and crystallized their distinctive competing interests, undermining efforts at coordination and eroding credibility in the system's rules. After European states declared current account convertibility at the end of 1958, Robert Triffin (1960) warned that, once outstanding dollar reserves held by the rest of the world surpassed the US monetary gold stock, this would increase the possibility of a run on the dollar and a collapse of the system. Thinking in terms of the interwar experience, Triffin worried that US monetary authorities would tighten policy, leading to a world depression. For him, the solution was the creation of an alternative reserve asset subject to coordinated management, like Keynes's (1943) proposed *bancor*. Closely related to the Triffin paradox was the critique that the United States gained an exorbitant privilege from the dollar's position in the system. Since the dollar was an international reserve currency, the United States did not have to adjust to balance of payments deficits and could promote outward direct investment (acquiring foreign assets), and the US government could borrow at lower rates than otherwise because of the global appetite for dollar-denominated assets. The French in particular resented this and periodically pressed for the world to return to the classical gold standard (with disruptive effects [Rueff 1961]). Recent efforts to measure the "privilege" accorded to the United States find it to be very small (McCauley 2015). Meanwhile, West Germans viewed the US deficits as inflationary, which ran counter to Germany's strong preference for stable prices and inhibited the Bundesbank from adjusting the *deutsche mark* or reducing persistent German balance of pay-

ments surpluses (Emminger 1967). Nevertheless, the dollar persisted at the core of the system because of its desirable properties as a vehicle currency and the unrivalled breadth and depth of US financial markets. At the time, Despres, Kindleberger and Salant (1966) argued that the United States acted as a financial intermediary borrowing short-term deposits and lending long-term foreign investment. In this view, as long as the Fed followed credible monetary policy, the dollar standard could persist.

As the Bretton Woods system crumbled through the second half of the 1960s, enormous energy was put into efforts to renew the framework for international policy coordination, with little tangible outcome. An army of international civil servants toured the world on behalf of the G10 industrialized countries, the OECD, the IMF, the Committee of 20 and the Group of 24 developing countries seeking to reform the system through schemes such as replacing the US dollar as primary reserve asset or broadening exchange rate bands (Solomon 1982; Williamson 1977). These efforts were plagued by a lack of consensus about the problem to be solved (too little international liquidity or too much) and the proliferation of interests that made a coherent focus more difficult to achieve as problems of unequal growth and development became more prominent during the 1960s. US Treasury Secretary Henry Fowler's call for a new World Monetary Conference in July 1965 fell on deaf ears as the prospects for a successful public meeting were too slim to risk the subsequent shock to confidence from a failure (Schenk 2010, 259). Even where a reform was achieved, in the case of the SDR (Special Drawing Rights) in 1967–68, there was no fundamental consensus about its purpose or operation, and it has remained for most of its life mainly a unit of account rather than an effective international monetary instrument (Schenk 2010). Prolonged discussions to make it more useful through a substitution account to supplement the US dollar during the 1970s failed (McCauley and Schenk 2015). Meanwhile,

the credibility of the exchange rate rules evaporated with multiple adjustments, currency crises, and the end of consensus either on the diagnosis of the problems in the international monetary system or the solution.

The General Arrangements to Borrow (GAB) in 1961 created a line of credit at the IMF sufficient to satisfy a speculative attack on a large country like the United States. Its lasting importance is perhaps less through its direct effect and more from the creation of a new tier of leadership in the global system. The Group of 10 countries involved in the GAB became an alternative to the IMF Executive Board as leaders of reform and as a forum for cooperation, challenging the broader constituency of the IMF and the interests of emerging market economies.² The G10 as a coordinating forum was further reinforced, since the G10 central bank governors formed the governing board of the Bank for International Settlements.

In addition to these ambitious efforts at renewed coordination through the IMF, there was the increased intensity of central bank cooperation through the auspices of the Bank for International Settlements. The monthly meetings of G10 central bank governors, supported by a technocratic secretariat and a set of topic-based expert standing committees (Goodhart 2011; Toniolo and Clement 2005) provided an opportunity for “soft” cooperation through a sharing of ideas, policies, and instruments as well as flexible, simple, and effective responses such as coordinated lines of credit and swaps.

The meetings were private and secret, with no formal minutes, and this promoted a frank exchange of views. The monthly meetings of G10 central bank governors and their staffs in Basel did not attract political attention or require parliamentary oversight

2. The Group of 10 were Canada, the United Kingdom, the United States, Italy, France, Belgium, Netherlands, Japan, Sweden, and West Germany. Switzerland also participated in multilateral activities through the BIS. Luxembourg also joined for the Basel Committee.

in the way that IMF meetings and edicts did. The BIS, therefore, became a preferred venue for cooperation for countries such as the United Kingdom, which struggled to maintain the sterling exchange rate through the 1960s until it floated in June 1972 (Schenk 2010; Schenk 2016).

There were three main cooperative efforts among central banks to support the gold and exchange rate rules of the Bretton Woods system: the Gold Pool, multilateral Group Arrangements, and bilateral Fed swaps.

The Gold Pool began as an intergovernmental initiative from the US Treasury secretary in September 1961 to keep the market gold price at the official price. It was thrust upon the G10 central bank governors in November 1961; only the Bundesbank was an enthusiastic supporter from the outset (Toniolo and Clement 2005, 376–77). Each central bank pledged a set amount for gold sales to the pool, and the US Fed matched the amounts of the other members to a total of \$270 million. On the other side, the Bank of England intervened to buy gold when this would not raise the gold price. Part of the proceeds from these operations (\$30 million) was kept to fund sales, thus saving the formal Gold Pool for times when there was a sustained upward pressure on the gold price, which started from 1965.³ The Gold Pool operated reasonably well until sterling was devalued by 14.3% in November 1967. This prompted a fatal loss of confidence in the gold value of the dollar and the market rate of gold was finally allowed to rise after a run in March 1968, although central banks and the IMF agreed to continue to trade at the official rate of \$35 per ounce. At this point, it became clear that the resources of central banks could not “buck” the market for any length of time. From this date, the gold convertibility rule of the Bretton Woods system was essentially over and the entire system’s days were numbered.

3. Canada, Japan, and Sweden joined in 1964, creating the G10 Gold and Foreign Exchange Committee, the precursor to the current Markets Committee.

A second (and less well-known) support was the arrangement of coordinated lines of credit among the G10 central bank governors at the BIS starting in 1960 (Schenk 2010; Toniolo and Clement 2005). A spike in the London gold price to \$40.00 in October 1960 on fears that John F. Kennedy would follow an inflationary policy if elected led to a flurry of attempts at cooperation (including gold swaps) between the ESF and a range of European central banks, a \$1 billion credit line of gold from the BIS, and finally revaluation of the deutsche mark and Dutch guilder in March 1961.

In this context of dollar fragility, the British convinced the G10 that supporting sterling was a vital bulwark for the continuation of the Bretton Woods system and thereby garnered multilateral support. The Italian lira received significant support but sterling was the main beneficiary, repeatedly arranging emergency short-term lines of credit: \$904 million in 1961, \$250 million in March 1963, \$1 billion in September 1964, \$3 billion in November 1964. To put this in perspective, \$3 billion in 1964 is equivalent to \$37.7 billion in 1997, which is close to the value of the \$40 billion rescue package arranged for Mexico in 1997 by the IMF, the World Bank, BIS, and bilateral swaps combined—and much more than the \$10 billion pledged to Mexico by the G10 central banks through the BIS. Even for the 1997 Korean Crisis, the 13 contributors to the coordinated rescue package only pledged \$20 billion.

From 1965 the Bank of England began to negotiate a longer-term solution to the retirement of sterling as a reserve asset, culminating in the First Group Arrangement in 1966, for up to \$1 billion in support to be activated by a specific fall in global sterling reserves (Schenk 2010). As with the other lines of credit, the First Group Arrangement was not fully drawn, partly because its very presence improved confidence. Only \$75 million of the BIS's own pledge was used, and the facility was renewed without much discussion in March 1967. However, the credit was completely exhausted by the time of the sterling devaluation of November 1967, as well as a

further line of credit of \$250 million organized by the BIS. But this was not the end of the G10 central bankers' cooperation to support the decline of sterling.

In the midst of a run on the dollar and the collapse of the Gold Pool in March 1968, the Bank of England tried unsuccessfully to get a new package of \$5 billion in credit. Instead, central banks pledged \$1.175 billion, almost half from extending the Fed's UK swap facility from \$1.5 billion to \$2 billion. Soon after, the BIS began to plan a Second Group Arrangement to retire sterling, supported by a \$2 billion line of credit (equivalent to \$38 billion today). This time, the United Kingdom was forced to negotiate bilateral agreements with each individual country that held substantial sterling reserves (34 in all) to limit the diversification of their reserves.⁴ This Second Group Arrangement was finally concluded in September 1968, popularly known as the Basel Agreement. It was renewed several times (despite the depreciation of the dollar in 1971 and the float of sterling in 1972).

A third defense for the dollar was the Federal Reserve's series of bilateral swap lines between the US and major currencies begun in 1962. The swaps were covered short-term loan facilities between the Fed and other central banks, usually for three months, and served two purposes. Countries outside the United States drew dollars to intervene in foreign exchange markets to support their currencies (the Bank of England drew \$8.65 billion from 1962 to 1971. On the other side, the Fed drew on the swaps to support the dollar price of gold. These swaps provided a short-term exchange value guarantee and thereby discouraged central banks from converting their unwanted or "excess" dollars to gold. The Fed drew \$11.6 billion in foreign currencies from 1962 to 1971 (Bordo, Humpage, Schwartz 2014). These swap lines were sometimes retired with foreign exchange or Roosa bonds (US Treasury

4. In 1968, 23 countries held over half of their reserves in sterling.

securities denominated in foreign currencies) (Bordo, Humpage, and Schwartz 2015, ch. 4). The swap network expanded from less than a billion dollars in 1962, when the first swap was made with France, to close to \$12 billion by August 1971 and \$20 billion by in mid-1974, by which time the network included 14 central banks (including the BIS).

These tools and rescue packages all worked in the short run to head off the “*crise du jour*,” but the system was no longer consistent with US domestic policy goals. By the spring of 1971 the French and British threatened to convert their outstanding dollar holdings into gold (Garber 1993; Bordo 1993), and in August 1971 President Nixon closed the US gold window on the advice of Treasury Secretary Connolly. The Bretton Woods system did not collapse into deflation as Triffin prophesized; rather the problem was inflation. The United States followed the key gold standard rule of keeping inflation low until 1965, but from then on the Fed followed expansionary monetary policy to help finance the Vietnam War and Lyndon B. Johnson’s Great Society. It thus broke the basic rule of the Bretton Woods system, and the Europeans became increasingly critical of US inflation (Bordo 1993).

Like the interwar system, Bretton Woods was a rules-based system, but the rules were both analytically flawed and incompatible with the political economy environment of the time. In each case the exchange rate rule was formally set (and in Bretton Woods there was an elaborate institutional framework to promote coordination), but there was no underpinning domestic policy rule to support the system. Policymakers at the time had an incomplete understanding of the role and effect of monetary policy, and they prioritized the pursuit of full employment over price stability (to varying degrees). To top this off, the United States as center country broke the key rule of the system by running an inflationary policy. That the Bretton Woods system lasted as long as it did was due in a significant way to effective central bank cooperation encouraged by

a deep fear of floating exchange rates and of the impact on the global economy of a collapse of the exchange rate rules. This cooperation transcended the collapse of the system that it was supposed to defend.

5. The transition to floating, 1968 to 1973

Although most currencies abandoned their dollar pegs in the early 1970s (starting with sterling in June 1972, followed by the deutsche mark and yen in a rush in February–March 1973), there was still a reluctance to abandon the pegged exchange rate rule (Schenk and Singleton 2011). Most developing and emerging markets retained some form of peg either to the dollar, sterling, SDR, or a trade-weighted basket. Most Western European countries took deliberate steps toward narrower exchange rate margins through the “snake” and plans for economic and monetary union (Mourlon-Druol 2012). During the 1960s, the trade integration of the European economies during the creation of the common market increased the cost of exchange rate fluctuations and led them down an exceptional path to monetary union, which we leave to others to discuss. Meanwhile, the US economy had more to gain from floating (or sinking) the dollar exchange rate while Europe and Japan had more to lose through uncontrolled appreciation of their currencies. The extraordinary tenacity of the appeal of a system based on a pegged exchange rate rule was clearly demonstrated in the ill-fated Smithsonian Agreement of 1971.

In August 1971 President Nixon finally ended the charade of the gold convertibility rule by closing the gold window, abruptly calling time on the efforts to resolve persistent imbalances by threatening a trade war and shifting the responsibility for adjustment to surplus countries. Within the US Treasury and Fed, there was increasing support for jettisoning the exchange rate peg as well, but the interim goal was for greater flexibility at an adjusted rate. The Nixon

Shock also belatedly woke the G10 and the rest of the world to the importance of Japan as a crucial player in coordination. Where the focus during the 1960s had been mainly on German surpluses, Japan was the main target of US pressure for adjustment in the negotiations in 1971. The Smithsonian Agreement rebuilt the pegged exchange rate system at new parities with wider bands, but the credibility of the system quickly evaporated in repeated runs on the dollar, until most countries had abandoned their dollar pegs by the spring of 1973.

As in the 1930s, the system was pulled apart by persistent imbalances, partly caused by two oil price shocks in 1973–74 and 1979. The end of the era of rapid growth with relatively low inflation prompted a loss of confidence among policymakers, and they mostly abandoned efforts at cooperation and coordination in an attempt to shore up their domestic economies. The seemingly endless circus of panels and meetings to reform the international monetary system continued throughout the 1970s in Paris, London, Washington, and Bonn, but there was little consensus on how to achieve stable monetary policy and no rules to underpin efforts at monetary cooperation and coordination.

Instead, the focus turned to how to correct persistent global imbalances through rules to force countries in surplus to adjust their exchange rates (a direct reversal of the burden of adjustment under the Bretton Woods system). Investigations had begun during the Bretton Woods era in the US Treasury as a way to redress the US deficit as well as to introduce greater exchange rate flexibility into the system, drawing on ideas from Richard Cooper (1970) and others (Schenk 2016). The so-called Plan X emerged from a special policy group led by Paul Volcker from 1969. By 1972 (before sterling floated), the proposal was for a set of indicators including the size of reserves to prompt multilateral pressure on a country to adjust its exchange rate. Although not initially gathering support from European states such as France, which were averse to floating

exchange rates, the concept retained its attractions and versions re-emerged in the mid-1980s and again in the 2000s as a way to discourage the accumulation of global imbalances. The key lesson from this period was the difficulty of reviving an international rules-based system when domestic policy priorities diverged.

6. Managed floating, 1973 to the present

6.1. 1973 to 1980

The international monetary system switched to a managed floating regime in 1973. Milton Friedman (1953) argued that floating rates had the advantages of insulating the domestic economy from external monetary shocks and giving monetary authorities the independence of conducting monetary policy to satisfy domestic goals without imposing capital controls. According to Friedman, independence from the constraint of pegged exchange rates required monetary authorities to follow stable rules-based monetary policies. His preferred rule was for the Fed to follow a constant money growth rate equal to the growth rate of real GDP adjusted for the trend growth rate of velocity. Otherwise, monetary instability, in addition to producing instability in prices and real income, would also lead to instability in the nominal exchange rate.

It took close to two decades for the Federal Reserve and other central banks (with the principal exceptions of the Bundesbank and the Swiss National Bank) to learn this lesson. The 1970s was a decade of monetary instability manifest in high and variable inflation. This was reflected in exchange rate volatility. There is an extensive literature on the Great Inflation (Bordo and Orphanides 2013). Many attribute it to flawed monetary policy by central banks trying to manipulate the Phillips Curve trade-off to achieve full employment. Others attribute it to the accommodation of supply shocks (Blinder and Rudd 2013). Inflation began to rise in the mid-

1960s and, as mentioned above, contributed greatly to the collapse of the Bretton Woods system.

Monetary authorities engaged in extensive intervention to stem the perceived volatility of exchange rates. The Fed and other central banks believed that foreign exchange markets were inherently unstable and that exchange market intervention was required to keep exchange rates close to their fundamentals and to reduce unexplained volatility (Bordo, Humpage, and Schwartz 2015, ch. 5). It was not until the next decade that the Fed and other central banks learned that stable domestic monetary policy geared to low inflation would reduce instability in nominal exchange rates.

Two of the props designed for the Bretton Woods system were retained through the 1970s. Even though sterling was meant to be floating, the G10 central banks were reluctantly convinced to launch a Third Group Arrangement in February 1977 of \$3 billion (equivalent to \$28.7 billion today) to finally kill off sterling's residual reserve role (Schenk 2010). This time the coordinated support was contingent on the IMF conditionality from the 1976 stand-by; the G10 had shifted their monitoring responsibilities to the IMF. The prolonged support for the orderly retirement of sterling from 1960 to 1978 was an important example of coordination among central banks to try to avoid a crisis in the global monetary system and manage an orderly transition.

The Fed's central bank swap system also continued, although the exchange rate cover offered to foreign central banks was removed, and as a consequence no G10 foreign central bank drew on the swaps from 1973 to 1980. The Fed, however, increasingly drew on the swap system to support their intervention to stabilize the dollar. By 1978, total facilities totaled \$29.4 billion, although, at its highest point (in 1978), outstanding Fed swap obligations amounted to only \$5.5 billion. The publicized ceilings had a largely representational purpose to demonstrate the commitment of the partners (Bordo, Humpage, and Schwartz 2014).

Against the background of rising inflation and with the dollar depreciating against the deutsche mark and yen and other currencies, the Federal Reserve engaged in frequent and massive sterilized exchange market intervention. Many of the sales of deutsche marks and yen were financed by borrowing via swap lines with the Bundesbank and other central banks until 1980. Some of the Fed interventions were coordinated with similar operations by the Bank of Japan, Bundesbank, and other central banks. After December 1975, the Fed cooperated closely with other central banks, keeping them informed daily of their actions, although all of the operations in this period were covert. Empirical evidence suggests that much of the intervention had very small and possibly very temporary effects in reversing exchange rate movements. Bordo, Humpage, and Schwartz (2015, 236) concluded that for the 1974 to 1977 period “only 49 per cent of the active interventions to support the dollar and only 64 per cent of the passive interventions to acquire German marks appear successful.”

The situation worsened in the next three years. In 1978 the dollar went into a free fall reflecting the Fed’s lack of success in arresting inflation. On November 1, 1978, the Carter administration (along with the Fed) announced a massive dollar defense package consisting of a one percentage point increase in the discount rate to 9½%, a \$30 billion increase in foreign resources, and closer cooperation with Germany, Japan, and Switzerland. The foreign currency package included a \$47.6 billion increase in the Fed’s swap lines with these countries. The Treasury also would issue up to \$10 billion in German mark and Swiss franc denominated securities, called Carter bonds (Bordo, Humpage, and Schwartz 2015, 243). Massive coordinated exchange market interventions with the Bundesbank and other central banks followed in the next two months. In reaction to these actions, the dollar began appreciating against the mark.

But the evidence for the period September 1977 to October 5 1979 suggests that “despite the changes in amounts, frequency,

objectives, and openness, US operations were no more effective than the earlier operations. As in the pre-1977 period, they demonstrated some tendency to moderate exchange rate movements” (Bordo, Humpage, and Schwartz 2015, 247).

In reaction to the volatility in the dollar and the public’s reaction to rising inflation and inflation expectations, President Carter appointed Paul Volcker as chairman of the Federal Reserve Board in October 1979 with the mandate to end the inflation. The Volcker shock of October 5, 1979, when the Fed shifted to a tight monetarist-type monetary (nonborrowed reserves) targeting strategy, raised the discount rate, imposed reserve requirements, and allowed interest rates to rise dramatically, eventually broke the back of inflation and inflationary expectations and reversed the decline of the dollar. Similar policies were followed in other countries.

The 1970s was a low point for the IMF as the official hub of international monetary coordination. It was only in 1976 that the IMF finally recognized the legitimacy of flexible or floating exchange rates, and from this time the IMF, seeking a role to replace the one it had lost, turned more resolutely to focus on the interests of developing economies rather than governance of the international monetary system. This effort also brought mixed success as the gap between rich and poor countries widened and many economies accumulated unsustainable amounts of debt, which erupted in the 1982 sovereign debt crisis.

Instead, the mid-1970s gave rise to the G- summits, starting with the G6 at Rambouillet in 1975 and adding Canada in 1976 and then Russia in 1998 to form the G8. These were annual meetings of political leaders supported by finance ministers’ meetings and meetings of central bankers. For central banks, of course, the summits supplemented the regular monthly meetings among G10 central bank governors at Basel. The summits generally resulted in rather mundane and repetitive public statements committing the participants to ensuring stable markets, but they also provided an op-

portunity for sharing of ideas and approaches to global economic challenges informally. The 1975 G7 Summit pledged members to “closer international cooperation and constructive dialogue among all countries” to combat inflation and unemployment, and members resolved that “our monetary authorities will act to counter disorderly market conditions, or erratic fluctuations, in exchange rates.” Very similar language is used in the joint declarations ever since, usually with reference to working in conjunction with the IMF. A more ambitious initiative at the Bonn Summit of 1978 saw each government explicitly committed to specific goals of growth, low inflation, and/or fiscal policy “to bring about a better pattern of world payments balances and lead to greater stability in international exchange markets”; it was dubbed “the locomotive.” But these efforts were derailed by the second oil crisis so that the next summit at Tokyo in 1979 focused instead on targets to cut oil imports and consumption.

Monetary cooperation via coordinated exchange market intervention (EMI) and other strategies did not work in this period. This was because most central banks did not follow a rules-based policy of keeping domestic inflation low, consistent with being on a floating exchange rate.

6.2. The 1980s

The 1980s saw a return to a consensus in monetary theory and policy. Paul Volcker’s success in stemming inflation in the United States was applauded by central bankers and governments across the developed world. An examination of the minutes of the monthly meetings of the G10 central bank governors shows that in the 1970s they shared their common frustrations with their governments’ inability to be consistent in their policy guidance and with the ensuing lack of credibility of monetary policy. They wriggled under their lack of independence when orders came from ministries to

reverse tight money to promote growth targets at the expense of higher inflation. Through these regular meetings at the BIS, the G10 central bank governors created an epistemic community with shared goals for inflation but also a general commitment to avoiding destabilizing short-term exchange rate changes. As the operational arm for coordination, this forum was important for sharing information, debate, and forming opinion even though they lacked policy independence. This observation goes beyond Eichengreen's (2013a) identification of the Basel Committee on Banking Supervision as an epistemic community to include the formative development of common approaches to monetary policy.

Volcker's policy shift was apparently taken with almost no external consultation (there was advance notice for the Bundesbank) so it cannot be classified as an example of cooperation or coordination. Instead, it set the stage for a new domestic based rule for monetary policy. During the 1970s central bankers had complained to each other at their monthly meetings in Basel about inconsistent ministers and treasury officials, the conflict between inflation and employment targets, and the lack of credibility of their monetary policy in this political environment. Volcker's "unconventional" monetary policy in 1979 was therefore applauded at the subsequent BIS governors' meeting, and Volcker's colleagues asked what they could do to help make the policy effective. Their enthusiasm was tempered by interest rate instability and perceived spillover effects through 1980 and 1981, but they continued to accommodate US monetary policy, and the communication at the monthly Basel meetings no doubt enhanced that process of cooperation through the sharing of information. At the same time, the system of swaps and coordinated short-term intervention to smooth foreign exchange market volatility that had been developed in the 1960s was continued.

The ability to follow a monetary rule was dramatically reinforced by innovations in smaller countries. New Zealand's exper-

iment with central bank independence and transparent inflation targeting set the model for the transformation of the credibility of monetary rules, just as economic theory and understanding of monetary policy was enhanced by the identification of the Taylor rule. By the end of the 1980s, therefore, we had returned to a rules-based system founded on domestic monetary policy actions by independent central banks acting in their own countries' interests, which seemed to generate a lasting period of moderate inflation. But the lingering ambitions for more elaborate coordination had much less success.

While central bankers moved closer to a common understanding on monetary policy, governments and Treasury bureaucrats continued to seek exchange rate stability or at least the "orderly exchange markets" described as the agreed goal in the revised IMF statutes. Exchange rate volatility continued as central banks learned to adopt and operate the new set of domestic monetary rules, and the 1980s witnessed a series of grand-gesture summitry to coordinate exchange rate and fiscal policy that produced mixed results.

The Volcker shock and three years of tight monetary policy led to a decline in inflation from a peak of 15% in 1979 to 3% by the mid-1980s. This led to a marked appreciation in the dollar to advanced countries—by 55% on a trade weighted basis. By 1985 Germany and other countries were complaining about the imbalances, and the Bundesbank had been intervening to offset the depreciating mark. More important, the strong dollar was harming the exports of US manufactured goods and this led to threats in the Congress to raise tariffs. The incoming secretary of the Treasury, James Baker, was a much bigger fan of macroeconomic policy coordination and of EMI than his predecessor, Donald Regan (under whose watch there was only limited EMI). So at the G7 Finance Ministers Summit meeting at the Plaza Hotel in New York City on September 22, 1985, ministers agreed that coordinated EMI would

be used to depreciate the dollar. They also agreed that the United States would follow expansionary monetary policy and Japan would do the opposite. Immediately upon the announcement, the dollar declined. However, it had been falling since February 1985, and the increase before the meeting was only a temporary blip. Massive coordinated intervention by the Fed, Bundesbank, and Bank of Japan lasted two weeks, but the evidence that it was successful is limited (Feldstein 1986). On the one hand, Humpage (1988) argued that monetary policy had turned looser well before the Plaza meeting and that this more likely explained the turnaround in the dollar. Bordo, Humpage, and Schwartz (2015, 304) found that the EMI did not have much effect on the exchange rate. On the other hand, Dominguez and Frankel (1993) found that coordinated EMI did have significant effects, and Frankel (2016) argued that the Plaza Accord was a success. However, the part of the agreement that urged Japan to follow tighter monetary policy than would be consistent with macro fundamentals led the Bank of Japan to keep rates higher than would be the case had it followed a Taylor rule in 1986 (IMF 2011; Taylor 2016).

The dollar declined through 1986, leading to concerns that it had fallen too far. Members at the G7 meeting at the Louvre on February 22, 1987, agreed to coordinate policies to stabilize the dollar. This meant coordinated EMI in the opposite direction than at the Plaza, and it meant that Japan would follow more expansionary monetary and fiscal policy while the United States and Germany and the others would keep their macro policies constant. As with the Plaza Accord, there is strong evidence that the EMI had little effect (Bordo, Humpage, and Schwartz 2015), but there were longer lasting effects on the Japanese economy that were devastating. After the Louvre Accord, policy rates deviated in a negative way from a rules-based policy, and many argue that this expansionary monetary policy triggered Japan's asset price boom and bust leading to a serious banking crisis, and to over a decade of stagnation.

6.3. The Great Moderation, 1985 to 2006

By the late 1980s, most advanced countries had low inflation, had adopted central bank independence, and were following rules-based monetary policy. This led to a 20-year period of stable and low inflation, and stable and rapid real growth. Most of the disturbances in the global economy arose in emerging economies rather than industrialized countries at the core of the global trade and financial system.

Beginning in the late 1980s, the Federal Reserve began to turn away from the use of exchange market intervention as a significant policy tool. An extensive debate at the FOMC and in the academy argued that sterilized EMI and credible monetary policy were conflicting goals. By 1995, Chairman Greenspan agreed, and the United States has only undertaken such actions on three occasions since. Also in this period, economists argued, based on game theory and multicountry econometric models, that central banks that pursued credible rules-based monetary policy minimized the spillovers that were believed to have necessitated coordinated policies (Taylor 1985). As it turned out, in this period there were fewer occasions when there was a call for monetary policy coordination other than the mundane statements at G7 summits. Instead, the main focus of cooperation and coordination returned to the lender of last resort role of the 1960s and 1970s.

6.4. Return to lender of last resort

While industrial countries mainly adopted floating or managed floating exchange rates, many emerging market economies with underdeveloped financial systems, and thin and shallow domestic foreign exchange markets, opted for adjustable pegged exchange rates. Through the mid-1980s, many of these economies grew quickly through export oriented industrialization, particularly

in East Asia. They were encouraged by the IMF and World Bank to liberalize their capital markets, but their institutions were not strong and this contributed to a rash of financial and currency crises in the 1990s as the dollar appreciated.⁵ These episodes were viewed as posing systemic threats via contagion to the advanced countries and prompted calls for international cooperation, with central banks serving as lenders of last resort to supplement the resources of the IMF. The pattern of support packages echoed several aspects of the Basel agreements of the 1960s and 1970s: the reluctance of debtors in crisis to submit to the IMF as a first line of defense, the insistence of creditors on an IMF seal of approval before offering coordinated bilateral support, the preference of central banks and governments to provide only contingent lines of credit that they hoped would not be drawn. But they differed significantly because the operations were bailouts rather than rescues (in the lender of last resort sense) (Bordo and Schwartz 1999, 2000), and this heightened the moral hazard.

In each case (Mexico, Thailand, Indonesia, South Korea, Brazil, Argentina, Russia), the crisis arose from overvalued currencies pegged to the US dollar, which were toppled by a sudden reversal of capital flows that prompted uncontrolled devaluation and a financial crisis. Weak financial sectors, heavy foreign-currency-denominated borrowing, government guarantees, and exuberant investors contributed to the fragility of the system (Bordo and Meissner 2016). In each case the debtor country initially sought to bypass the conditionality of the IMF and activate swaps or bilateral support (Boughton 2012). But, in line with the final coordinated support offered by the G10 to the United Kingdom in the 1970s, creditor countries insisted on an IMF “seal of approval” through a contingent (smaller) standby agreement with a letter of intent. The IMF insisted on devaluation, restructuring financial markets, and fiscal

5. In the 1990s many emerging market countries were advised to adopt firm pegs or currency boards to import credible noninflationary monetary policies.

retrenchment, with mixed success. International policy coordination was thus operated through the IMF Executive Board and then central banks and finance ministers supplemented this credit, often in larger amounts. The difference from the 1960s and 1970s was that the funds were used to bail out creditors rather than as a resource for central banks to gain a breathing space. The coordinated operations therefore created moral hazard that was only partially offset by the IMF-induced restructuring programs (more successful in some countries than others).

We judge that the coordinated response to the emerging market financial crises was not a full success. Although the crises were eventually stemmed and growth returned under more flexible exchange rates, they left a legacy of institutional problems that exposed the weaknesses of these regimes a decade later. The bail-outs did not remove the incentive of countries to accumulate substantial precautionary reserve. The fragility of the global system was increased by many countries aiming to run persistent balance of payments surpluses during the 2000s as insurance against a future sudden stop and to avoid the necessity of submitting again to the disciplines of a future rescue package.

While the currency crises of the 1990s pushed most emerging market economies to greater flexibility by 2000, the People's Republic of China became an increasingly important nonconformist. The renminbi exchange rate was not devalued in the wake of depreciations elsewhere in Asia, and this helped to support export recovery in the region as Chinese economic growth accelerated in the run-up to World Trade Organization accession in 2001. From claims that the renminbi was overvalued in the early 1990s, critics soon pointed to China's huge surpluses as proof that the renminbi was undervalued. Capital controls and consistently high growth allowed China to resist calls to appreciate its currency, but the increasingly large and persistent current account surpluses, most of which were unsterilized, came at some

cost to price stability, particularly in volatile real estate and other asset markets. At the same time, China's role in the governance of the global monetary system became more and more distant from China's importance in the global economy. In 2005, the renminbi was appreciated slightly and a more flexible regime was adopted to allow an orderly appreciation, although the results were at first somewhat disappointing. China has had a challenging history with the IMF, mainly focused around their historically small quota (and therefore small voting rights), their iconoclastic international monetary policy, and continued exchange controls (Schenk 2015).

After the global financial crisis focused even more attention on the systemic risks of persistent imbalances, China and other large emerging economies were brought more closely into networks of cooperation and coordination through the G20 from 2009, including the renminbi in the SDR in 2016 and the eventual ratification of the 2010 IMF quota enlargement at the end of 2015. But challenges persist because of the nature of the Chinese political regime and slowing growth. Without a shift to open capital markets and liberalization of the financial system (which seems a long way off), China remains a threat to global stability.

Thus the coordinated rescues during the emerging market crises of the 1990s were quite far removed from rules-based policy. First, the rescues were bailouts to countries facing insolvency and not to countries facing a temporary liquidity shortfall, hence violating a key Bagehotian principle and engendering moral hazard for future crises. Second, these countries did not follow rule-like domestic monetary policies because they had not developed sufficiently in the sense of having weak institutional structures and governance and not having deep and liquid financial markets, and in other ways. Some of these countries in recent years have adopted rule-like policies, for example, Mexico and South Korea, but not all, for example, China.

6.5. 2007 to the present

The Great Moderation ended with the subprime crisis of 2007–2008. There is a voluminous literature on the causes of the crisis. The main ones are: departures from rules-based policy fueled the housing boom bust; global imbalances; and lax supervision and regulation of the financial sector that led to the development of mortgage-backed securities and other derivatives combined with excessive leverage (Bailey and Taylor 2014).

The response to the crisis in 2007 was for the central banks individually to follow very expansionary monetary policies. By early 2008, they were worried about a commodity induced inflation and so they stopped expansionary policy. The events of the summer of 2008, leading to the collapse of Lehman Brothers, created a full-scale global financial panic reminiscent of the summer of 1931. This led to massive unprecedented lender of last resort actions (although many did not follow classical Bagehot's rules [Bordo 2014]) by the Fed, the Bank of England, and other central banks. It also led to a reactivation of the swap lines by the Federal Reserve in September 2008 to provide dollar liquidity to the ECB and other foreign central banks who faced dealing with the liquidation of the dollar denominated mortgage-backed securities and other toxic derivatives held by their banks. This cooperative policy may have averted a global panic. Indeed, something similar might have averted the international aspect of the meltdown of 1931.

In addition to the swaps, at the G20 Summit in Washington, DC in November 2008, leaders of the G20 committed themselves “to stabiliz[ing] financial markets and support[ing] economic growth,” with particular emphasis on “the importance of monetary support” as well as fiscal expansion. They also committed themselves anew to reforming the architecture of the international financial system, and the governing board of the BIS was extended to allow nine other central banks to be members.

By the end of 2008, the financial crisis had ended, but the real economy was still contracting and the federal funds rate and other central bank's policy rates had hit, or were close to, the zero lower bound. The Fed announced its policy of quantitative easing (QE1) in December 2008—the unconventional policy of large-scale open market purchases of long-term Treasury securities and agency mortgage-backed securities. In addition to the purchases, the Fed began forward guidance to manage financial markets expectations. The Bank of England similarly engaged in quantitative easing from March 2009 and forward guidance from August 2013, related to a target unemployment rate of 7%. The ECB followed in May 2009. Japan had a longer history of QE from March 2001 to 2006 and renewed its policy in October 2010. These initiatives were successful in arresting the Great Recession by June 2009 in the US, but the recovery that followed has been anemic. Further, the spillover effects have been controversial.

QE policies deployed by advanced economies were particularly criticized for adverse effects on emerging market countries, primarily through capital flows and exchange rates. Investors surged into emerging markets, increasing asset prices and appreciating currencies. These spillover effects undermined export competitiveness, increased exchange risk on debt, and threatened asset price bubbles. In May 2013, when Federal Reserve Chairman Ben Bernanke suggested that QE would be “tapered,” volatility in emerging market asset prices led to renewed calls for greater coordination. The specter of the interwar crisis returned, and (as in the interwar period) there were calls for greater monetary cooperation to avert a “currency war” (described in Eichengreen 2013b).

The extent and cause of spillover effects is disputed. Certainly, US monetary policy has global implications because of the importance of US capital markets and the role of the dollar. Spillover effects appear greatest when Fed announcements surprise the markets, and there is evidence that these effects were greater after the

global financial crisis than before it (Chen et al. 2014). However, there are structural factors in emerging market economies which can make them more resilient to spillovers—such as higher growth, stronger balance of payments, lower share of local debt held by foreigners ex-ante, and liquidity of financial markets. The evidence seems to suggest that advanced economies should avoid surprises and carefully signal their policy to the market while emerging market economies should reinforce their economic fundamentals and market liquidity to increase their resilience.

Moreover, allowing a free float of the exchange rate ensures that emerging markets can target independent monetary policy on domestic price stability (and in the short-run output stability also known as flexible inflation targeting) even in the presence of spillovers. If monetary policy is instead aimed at exchange rate stability or promoting exports, then there may well be challenges for emerging market economies to absorb spillovers (Ammer et al. 2016). Taylor (2016) argued that it is deviations from rules-based policies since 2002 that have led to the spillovers and that the solution is to return to the policies followed in the Great Moderation. The case that greater monetary cooperation is a necessary solution to spillover effects is not proven.

But there is also evidence of externalities that promote procyclicality and systemic risk in financial markets, which has prompted calls for macroprudential policymaking to increase financial stability (Claessens 2015). These policies may complicate the effective use of monetary policy dedicated to low inflation.

At the November 2008 G20 meeting (as the world clamored for a solution and villains were identified), new institutions were created to provide fora for cooperation. The IMF was tasked with monitoring spillover effects, publishing an annual report. The Financial Stability Board (2009) brings together central banks, finance ministries, and supervisory agencies to encourage “coherent implementation” of good practice and implement agreed-upon standards and

codes, undertaking peer reviews of macroprudential policy frameworks. While easily dismissed as “talking shops,” the exchange of information, ideas, and communication may bear some fruit in the long term in creating consensus around a common or agreed-upon framework of rules.

7. Conclusions

A number of conclusions follow from our survey;

1. Monetary policy cooperation generally is successful when done in a rules-based environment. This was the case under the gold standard and in the Great Moderation. Cooperation in these regimes was done for technical or lender of last resort reasons and supported the communication needed to develop a shared consensus about what rule was best.
2. Monetary policy cooperation does not work when domestic and international policy priorities are inconsistent, that is, when an international policy rule (for example, exchange rate stability) conflicts with domestic goals of price stability or full employment. Thus, the agreed-upon international rules conflicted with domestic priorities during the interwar gold exchange standard, the Bretton Woods system, and the early 1980s. Under the classical gold standard and during the Great Moderation, by contrast, the nominal anchor rules were consistent with price stability.
3. It follows that short-term efforts at international monetary policy coordination do not work when they involve a departure from domestic policy fundamentals, for example, Long Island 1927 and the Plaza and Louvre accords.
4. The coordinated rescues of the emerging countries in the financial crises of the 1990s were mainly bailouts and were not based on Bagehot’s principles. This promoted future risky behavior. Moreover, in a number of cases, the recipients did not graduate to the

monetary policy strategies of the advanced countries, leading to later instability. Recent cooperation, largely through the BIS, has helped to create an epistemic community of central banks that has learned to follow rules-based policy. This has been beneficial but will be challenged by the addition of new members to the BIS governing board and by the proliferation of multiagency groups.

5. A return to a rules-based system under floating exchange rates now that the Great Financial Crisis is long past would provide an environment conducive to stable economic growth and low inflation for the world, as was the case during the Great Moderation.

The evolution of central bank cooperation and coordination since the classical gold standard has closely followed the evolution of central bank credibility (Bordo and Siklos 2014, 2016). Under the classical gold standard, central banks had high credibility because the gold standard rule was primarily a domestic rule and the international gold standard rule followed from that (Bordo and Kydland 1995). Central bank cooperation was perfectly consistent with that arrangement. In the Great Moderation, central banks enjoyed high credibility because under floating exchange rates they learned to follow domestic rules-based policy focused on price stability and had the independence to pursue their targets consistently.

But in the intervening seven decades, central bank credibility declined because the underlying theoretical and political economy framework dramatically changed towards maintaining domestic aggregate demand and full employment along with fixed exchange rates and the gold convertibility rule—an impossible task, which became evident in the interwar and, later, the Bretton Woods era, even with capital controls. Central bank cooperation and coordination was effectively used to prop up the Bretton Woods system through short-term fixes, but ultimately these regimes were doomed by the growing inconsistency of policy goals. It took the strains of the Great Inflation to create the learning environment to

restore central bank credibility and identify a sustainable rule based on domestic monetary policy.

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DISCUSSION BY ALLAN MELTZER

Today's paper is another in the long list of excellent historical surveys by Michael Bordo and his many coauthors. This time the topic is the changing role of cooperation and coordination in international monetary arrangements as the international system evolved from the classical gold system through the gold exchange system of the 1920s to Bretton Woods and finally to floating exchange rates with areas of regionally fixed exchange rates and considerable intervention.

Although some countries suspended the standard on occasion, the classical gold standard is an example of successful rule-based market coordination of policy action. A member was obligated to increase or reduce reserves and interest rates in response to gold flows. Full-time adherents like Britain generally avoided disruptive discretionary actions. The future gold exchange rate was as certain as it could be. Once that rule-based arrangement for policy coordination ended in 1914, it was never fully restored. Subsequent arrangements never achieved the degree of cooperation that existed under the pre-World War I gold standard because they did not prevent discretionary policy action as the classical gold standard had. Bretton Woods came closest but only in the early years when the United States followed the rules. By the mid-1960s, the United States and the Europeans could not agree to cooperate by adopting a rule for adjusting the misaligned dollar exchange rate.

I liked the section on the working of the gold exchange standard because it is not often examined so thoroughly. Despite efforts by Benjamin Strong and Montagu Norman to restore much of the automaticity of gold standard rules for coordination, British responses to economic problems, French lack of cooperation, and capital flows to the New York equity market were not subject to rules for cooperation and coordination. In fact, as Bordo and Schenk report,

efforts to cooperate by assisting Britain in 1927 aroused members of Congress. Some later accused Strong of causing the Great Depression by cooperating with British efforts to maintain the gold exchange rate. This suggests the widespread ignorance about or opposition to gold standard rules.

My succinct summary of the main lesson learned from the exchange rate policies that followed the gold exchange standard is that no system of fixed or floating rates can achieve exchange rate stability as long as major countries do not adopt and follow rules for monetary policy. The most frequent violation of a monetary rule arises when governments finance expansive or contractive fiscal policies by issuing or reducing debt and expanding or contracting money growth by buying or selling government bonds or other assets. Countries' commitments to rules for cooperation and coordination are not often strong enough to counter domestic pressures to spend to reduce unemployment rates or respond to other major changes such as an oil shock.

Two very different ways of maintaining exchange rate stability have been tried since World War II.

Keynes tried to manage international coordination by getting countries to agree to a rule for fixed but adjustable exchange rates. Under the Bretton Woods system, governments could use fiscal and monetary actions for domestic economic stabilization, but their actions were limited by the fixed exchange rate. Keynes innovation was an IMF rule that allowed countries to adjust exchange rates rather than deflate, but the rule required IMF approval of the change. Early on, France violated the rule by devaluing without IMF approval. The rule was not enforced.

As Bordo and Schenk note, the United States was the more important cause of Bretton Woods's failure. The Johnson administration ran large budget deficits. By the 1960s, Chairman Martin accepted that the Federal Reserve had to keep interest rates from rising by financing administration budget deficits. By doing so, he

abandoned the principle on which the Fed was founded that barred the Fed from financing government spending and deficits.

The Martin Federal Reserve concerned itself with domestic policy, leaving the exchange rate and trade deficit to the Treasury. During the Johnson administration, each new exchange rate crisis brought new regulations and restrictions, but the actions were temporary palliatives that neither permanently changed the real exchange or enforced monetary rules. International cooperation at the time was limited.

The Nixon administration appointed Paul Volcker as Undersecretary for Monetary Affairs. Within a few weeks of taking office, Volcker wrote about the need to devalue the dollar. He proposed taking two years to reach agreement with the other members on an adjustment of the dollar exchange rate. After two years, he said, the United States would have to act unilaterally. Little more than two years later, President Nixon suspended gold payments.

Bordo and Schenk discuss the short life of the Smithsonian Agreement that devalued the dollar. The United States did not change policy to support a cooperative agreement, and other countries did not support the dollar. After the new international agreement failed, Treasury Secretary Shultz floated the dollar. The new arrangement did not restrict government monetary and fiscal policies or outlaw exchange rate intervention. Soon after, the Arab oil countries raised the oil price in an effort to recoup losses caused by dollar devaluation. The first oil shock imposed real as well as monetary changes in all countries. Countries pursued their separate interests with no coordination attempted.

The Federal Reserve and some other central banks misinterpreted the change in the relative price of oil as evidence of inflation. Contractionary policy actions introduced additional exchange rate adjustment. At the end of the 1970s, the Federal Reserve repeated the misjudgment or error by treating a second oil price increase as evidence of increased inflation. Markets efforts to find equilib-

rium exchange rates failed. No one could correctly anticipate future policy. Exchange rates reflected the prevailing uncertainty about current and future policy.

Talk of unstable floating rates, as is often done, seems misplaced. The problem is best described as absence of a policy rule guiding major countries, especially the United States, because the dollar continues to serve as the principal international currency.

Those who claim that greater exchange rate stability without a monetary rule would improve economic outcomes should look at the ECB. It has a fixed nominal exchange rate but lacks an agreed-upon rule for adjusting real exchange rates. There is no agreement among the members on a monetary rule. Principal members France and Germany follow very different, incompatible policies.

The European Central Bank has a negative interest rate to encourage expansion. President Draghi should look across the border to Switzerland, where the Swiss National Bank has a negative interest rate to discourage capital inflow. The negative rate has slowed the Swiss economy from an average of above 2% to less than 1%. The ECB and the SNB cannot both be right. I believe the data support the Swiss.

During the period from 1986 to 2002, Alan Greenspan more or less followed a Taylor rule at the Fed. This produced the best long period outcome in Federal Reserve history. Uncertainty declined, and exchange rates were relatively stable. Economists call it the Great Moderation. Stable monetary policy also reduced exchange rate variability.

Current Federal Reserve policy responds to current or recent announcements of economic data. Policy actions are ad hoc and unpredictable. The Fed gives out no information that could be used to predict its medium term actions. It probably does not have a medium-term strategy. Any cooperation with other central banks is entirely ad hoc.

To sum up, what do we learn from more than 100 years of exchange rate policy? I draw three major lessons from the more than one hundred years of history that Bordo and Schenk summarize for us. First, the way to increase exchange rate stability, whether of fixed or floating rates, is to reduce policy uncertainty. If the exchange rate floats, the central bank should adopt and follow a monetary rule. The rule should include an enforcement mechanism and restrictions on fiscal actions. Second, rules enforced by market responses, like the classical gold standard, are likely to work better than rules that leave enforcement to central banks. Domestic pressures in most countries are usually much stronger than commitments to international cooperation. Third, the Federal Reserve has not developed either a domestic strategy or decided on its responsibilities as the world's major currency.

Finally, a few words about actual current and recent exchange rate policy. After the bad prewar experience with competitive devaluation in the late 1930s, major countries agreed at Bretton Woods that they would avoid competitive devaluation, called at the time "beggar thy neighbor policy." The Bernanke Fed broke that promise and hid their action by calling it QE. The correct name was competitive currency depreciation. Japan and the ECB followed. Both called their actions QE presumptively to hide what they were doing.

As in the 1930s, competitive devaluations have not brought export growth. They have two main effects on third countries. If they expand output in the devaluing country, some third countries might experience an increase in their exports. But this effect currently seems small. All third countries experience a rise in their exchange rate when the dollar, euro, or yen depreciate. The current problems of the third world suggest they have been hurt on balance. There is no cooperation, no coordination because there is no policy rule. Restoring the agreement to rule out competitive devaluation should be high on the monetary reform agenda.

GENERAL DISCUSSION

ANDREW LEVIN: I want to follow up on something that Secretary Shultz said. He referred to this era of social media and instant communications around the world. I'm wondering, the tradition of central banks meeting in relative confidentiality or secrecy, depending on how you want to characterize it, at the Bank for International Settlements and other forums, obviously has benefits. But there are also costs. And I'm just wondering how the two of you view that. Is it time for a change? The same kind of discussions have happened about trade agreements. In the old days, those were made behind closed doors and not released until the very end. To the extent to which central banks do cooperate or coordinate, how transparent should it be?

CATHERINE SCHENK: There is obviously a tradeoff between transparency and effectiveness sometimes, and maybe it depends on what it is that you're trying to achieve. I think that the difficulties and challenges of going through the International Monetary Fund diverted a lot of energy back through the BIS, and that has its advantages and disadvantages. In the longer term, it made countries very averse to going to the IMF for support. It led to the precautionary accumulation of insurance reserves, for example after the 1990s. So there are dangers to that kind of publicity as well. I think, talking about the BIS group, looking at the minutes—and I know there are no official minutes, but the Reserve Bank of New York representatives took verbatim minutes, and they can be found in their files—there is argument, quite frank argument, amongst the central bankers. And that's partly because they're not being observed, and they don't feel they're being recorded. And there is a move towards an understanding of sharing of best practice, of operational skills, and tools and instruments, that is pos-

sible in that kind of environment, that wouldn't be if it were more public.

ALLAN MELTZER: Andy, I think the strength of congressional pressures, market pressures, the pressures of the unemployed or those who are suffering from inflation, are just too strong in democratic countries these days to be able to have coordinated policies of that kinds. So the best that we can hope for, I would think, would be that each country would follow a rule, and then you could at least, to a much greater extent than you can at present, figure out for yourself what the likely effect of that will be over the near term and over the medium term. We don't have the gold standard, not because people don't know about the gold standard, but because they do. It's a standard that maintains exchange rate cooperation. What the public wants is macroeconomic coordination.

CHRISTOPHER ERCEG: The ability of central banks to achieve their monetary policy objectives clearly depends on financial stability, and financial stability in turn depends on effective cross-border macroprudential regulation, given the potential for large financial spillovers across national borders. In this vein, I am interested in knowing if you are any more sanguine or optimistic about the possibilities for effective macroprudential policy coordination across countries, particularly in economies in Europe that would seem to face significant challenges.

MICHAEL BORDO: I'm somewhat pessimistic about that. Because of the European Union and Economic and Monetary Union, the Europeans need to do more coordination. Indeed, for Europe to succeed, it must have a banking union like we have. But for other countries, I'm not so sure. These issues are being discussed at the BIS today, and that is a good thing. Information sharing, especially, via the BIS is very helpful. But trying to constrain sovereign countries to do things that they wouldn't have done otherwise will always backfire.

CATHERINE SCHENK: And can I just add, in terms of the Basel Committee and the Basel process, Basel I, Basel II, Basel III— they were always responding to the last crisis, so it is quite a backward looking and prolonged process that incorporates the banks in developing the regulations for themselves. It's the Basel process that brought in the rating agencies; it's sort of fundamental to the credit risk weighting and that sort of thing. So I'm also quite critical, I think, of that aspect.

ALLAN MELTZER: The great problem in trying to get financial stability is to try to get market solutions to these things. I testified four times in the Dodd-Frank hearings. Eventually, I helped to write a bill with Senator David Vitter, and he was wise enough to make it a bipartisan bill by getting a Democratic liberal senator to sign on to it. But the banks, especially the New York banks, opposed it. So it never got into committee. The pressure is from the big banks to regulate to their benefit, and so, What has been the result of that? We had, not very long ago, 1,400 banks in the United States. We're now down to around 550. The middle-sized banks are going out of business. They're the people who used to do the lending to small and medium-sized startups. They didn't do it on the basis of income sheets and balance statements. They did it on the basis of being local and knowing the character of the borrowers. That part of America is rapidly disappearing because of the heavy cost of regulation under Dodd-Frank and the low interest rates, so they can't find loans to make to these people at interest rates where they want to take on the risk. So we're losing an important part of the mechanisms that created growth and new enterprises in this country.

HARALD UHLIG: I always learn important insights when I hear Mike Bordo and coauthor Catherine Schenk talk about economic history. So one thing that struck me in particular was the story that essentially the 1927 clandestine meeting on Long Island, where the New York Fed decided to help out the pound

sterling, subsequently triggered the expansion in the stock market, the subsequent stock market crash, and the subsequent depression. That's almost what it sounded like. I mean, that statement strikes me as wild, but if you say to us that it's true, I would imagine just highlighting that more and bringing it out more would be interesting. If it's really true, it sounds like you should never, ever allow central bankers across the world to meet. Right? That's such a disastrous outcome, and I'm probably happy about the forces that Allan described about domestic considerations nowadays being much more important in preventing that sort of really disastrous type of coordination. Is that the sort of conclusion you'd like to draw from the analysis? I'm just wondering, because that's how it sounded to me.

The second thing is you also emphasized that, going forward, it would be nice to go back to a rule-based regime. And that sounds all good and nice, and then I thought, What rules? Right? I think what the financial crisis has shown to us, all those Euro-bank considerations and so forth, is that all the nice rules that we used to preach and teach our students, they're kind of all out of the window. I mean, what do we do now? I can't follow the Taylor rule if there is a zero lower bound. Is the Friedman rule a good one? What rule? Where's the solution to that one coming from? I guess you're saying, we should get back to the drawing board and find some good rules that will be useful in the future.

MICHAEL BORDO: The jury is out on the 1927 meeting as a catalyst to the disasters that followed but other factors like major Fed monetary policy mistakes are more important. Liaquat Ahamed's *Lords of Finance*, nicely dramatizes this story. That said, it is not clear that Benjamin Strong's actions in 1927 were the bellows that fueled the fire, that led to the assets price boom, that led to the crash. There is some evidence, however, and Friedman and Schwartz and others discuss it, that the policy was not necessarily dictated by fundamentals and that the Fed

was following too expansionary a policy. How much? We don't know. What happened was that several years later in 1931, after Benjamin Strong's death, Carter Glass and one of the governors of the Federal Reserve, Adolph Miller, picked up on this, and, and they blamed him for all that had happened. Then Herbert Hoover in his memoirs in 1951 said that, if it hadn't been for Benjamin Strong and Montagu Norman (governor of the Bank of England), he would have stayed in office for another term. And so this is where the story comes from. But the evidence is not overwhelming that 1927 was the key cause of the Great Contraction.

With respect to the second issue, I'm thinking in terms of something like a Taylor rule, in an environment where we have already moved beyond quantitative easing and are getting back towards conditions that prevailed during the Great Moderation. What our survey tells us is that if you have a rules-based system, you tend to do better. And then going forward, the question of what rule to be picked is another question.

CHRISTOPHER MEISSNER: I thought Chris Erceg's point was really interesting, and I was going to bring up something similar, maybe something to follow up with. Two other examples of coordination or lack thereof, domestic monetary policy in the United States in the 1920s and 1930s—Gary Richardson and Billy Troost showed major disagreements about the correct response to banking panics. Does that fit your model? I don't know. And then what about European monetary system crises of the early 1990s. I didn't notice it in the paper. I only skimmed through it, but where is that situated in this idea?

CATHERINE SCHENK: I'll take the 1990s maybe. We have pushed Europe to one side. It is an exceptional story towards economic and monetary union. We've heard a little bit about it here today. I don't think it's a successful example of international monetary coordination, as we're seeing, and we'll see how long it lasts. So

the European Exchange Rate Mechanism (ERM) in the 1990s—again it follows a period where there’s a decline in average deflation rates, and there seems to be some kind of convergence during the ERM period but also a lot of disruptive departures, of course in 1992 and elsewhere.

ROBERT KAPLAN: Given that, over the last number of decades, manufacturing as a percentage of GDP by country has changed dramatically, and the nature of global trade has changed dramatically; I would think those shifts would have an impact on the issue of exchange rate policy coordination. How do you think about that? How might these shifts impact the way we think about attempts to coordinate policy?

MICHAEL BORDO: I’m not quite sure I understand why that would matter. But here’s what I think, if what you’re saying is that, because there’s been much more of a move toward services and financial services, that creates a potential for instability, which we didn’t have before. Perhaps the difference in structure matters, but I am not sure about it. I still think if you just look at the record and follow the message that comes out of our paper, which is that, if rules-based policies are followed, these problems could be dealt with regardless of the composition of output and trade. I’m just not quite sure why it would matter.

ALLAN MELTZER: I would think that the main way in which it would show up would be in the current account deficits, that is, if the short-term—certainly maybe longer-term—has effects on the current account deficit. If you’re following a monetary rule and allowing exchange rates to float, then you get at least a response. It may not be a perfect response, but you get a response to the shifts in the current account deficits.

BILL ENGLISH: I have a question for Michael. I think you use the term “rules-based policy,” but it isn’t clear to me what you mean by “rules-based policy.” Alan Greenspan in 1990 or so probably didn’t know he was following something along the lines of a

Taylor rule. He thought he was making policy from meeting to meeting. But nonetheless, I guess you view him as having been rules-based. What about Paul Volcker? I'm not sure Volcker should be seen as a rules-based policymaker. He certainly generated a lot of policy surprises. If he was rules-based, I'd be interested to know what the rule was.

ALLAN MELTZER: I don't know what Alan Greenspan had in his mind, but if you look at what he did, and compare it to what you would do if you were more or less following a Taylor rule, they look pretty similar. Now I say that because Alan Greenspan was much too wise to say publicly that he was going to commit himself to any rule. That would be a signal to all the people who didn't like what he was doing to complain about what he was doing and blame the rule. So I don't know about that. Volcker was not following a rule. Volcker was following something that the Fed, to its unbelievable mistake, paid attention to. He looked at what was happening to money and credit, and the current Fed, as I understand it pays interest on reserves so it can keep the money growth from rising.