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International Aspects of Central Banking: Diplomacy and Coordination*

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I. Introduction

In this paper, we discuss the evolution of central bank interactions since the early 1970s following the breakdown of the managed exchange-rate system that was negotiated at Bretton Woods. We focus not only on how central banks interact with one another in normal times, but also on how they behave during times of crisis. Today, central banks have more forums in which they interact without finance ministries than they did in earlier times, reflecting the fact that the focus of interactions has shifted away from managing exchange rates and toward monitoring and regulating the international financial system, global financial institutions, and cross-border capital flows.[1] At the same time, the rise in statutory independence has given central banks more authority to shape the response to events, and the rise of new powers and their integration in markets has resulted in the broadening out of the prominent coordinative groupings to include countries outside the historically traditional major powers. Within this context, our main conclusion is that the relationship-building that is inherent in multilateral interaction has provided a springboard for coordination in times of stress or crisis.[2] Moreover, crises matter in that they can be turning points in terms of the actions taken and the countries included in the dialogue; thus, the groupings themselves are to some extent endogenous to events.[3]

Even in the relatively short period during which central banks have been an institutional mainstay of society, there have been dramatic shifts in how central banks have interacted. During the gold standard and the Bretton Woods period, central bank coordination was typically bilateral and involved the provision of liquidity to support the convertibility of currencies and maintenance of the exchange-rate system.[4] Following the end of managed exchange rates in 1973, central banks shifted their focus to achieving price stability and, during the 1990s, began to orient their monetary policies around inflation targeting—a framework which did not require

[1] A major theme in Bergsten and Henning (1996) is the increasing role that central banks have played over time.

[2] In our view, relationships are a necessary condition for action during a crisis; of course, this point cannot be proven definitively because we are not able to observe the outcomes that would arise in the absence of such relationships.

[3] This framing is similar to what Krasner (1984) terms "punctuated equilibrium," in which new institutions or structures arise during times of crisis and the "dynamics associated with a crisis of the old order and the creation of a new one are different from those involved in the perpetuation of established state institutions" (p. 240). The theory of punctuated equilibrium comes from evolutionary biology and has been applied in many different disciplines.

[4] There are many histories that discuss central bank coordination during the fixed exchange rate period; see, for example, Eichengreen (2011) and Flandreau (1997).

cooperation *per se* (although central banks continued to meet and discuss their policies and objectives).[5] By the end of the 1990s, inflation targeting had been adopted not only by advanced economies but by many developing and emerging market countries as well. Over the same period, with the increase in financial liberalization and capital flows, central bank cooperation was expanded to include the codification of standards and rules aimed at ensuring the safety and soundness of the international financial system. Since the global financial crisis that began in 2007, much more talk among central banks has been dedicated to discussions of financial stability.[6]

It is perhaps no surprise that we have seen such large historical shifts in central bank interactions. How scholars have interpreted these interactions has changed over time. Papers on multilateral interactions typically differentiate the types of those interactions into categories, with no two studies using an identical taxonomy. For example, Bergsten and Henning (1996, p. 13) distinguish between cooperation and coordination, where the former refers to "all collaborative activities among governments" and the latter is the subset of cooperative activities that involves the "mutual adjustment of national economic policies." Cooper (2006) defines central bank cooperation as having six facets: sharing information; standardizing concepts; exchanging views on global economic developments and the objectives of central bank policy; discussing the economic outlook; standardizing concepts with a possible adjustment of regulations; and agreeing to joint actions. James (2013) sees the progression from collaboration (pure information exchange); to discursive cooperation (discussion of policy objectives or technical issues); to instrumental cooperation (actions that are made more credible because they are undertaken jointly); to coordination (an extreme form of instrumental cooperation in which the action would not have been undertaken in ordinary circumstances but supports a shared longer-term goal).

In our view, the activities specified by the various taxonomies can be broadly classified into two types: relationship-building and joint actions.[7] Relationship-building, which we term

[5] For a description of the inflation targeting framework, see Bernanke and Mishkin (1997).
[6] Balls, Howat, and Stansbury (forthcoming) discuss the implications of the broadening of central bank remits for institutional design and independence.
[7] Our classification is similar to the one adopted by Borio and Toniolo (2006) who distinguish between information exchange (which they term "low-key cooperation") and joint decisions or actions ("high-profile cooperation").

"diplomacy," includes all forms of public and non-public information exchange—discussions of: current economic conditions, the economic outlook, statistical models of the economy, or statistics. Diplomacy develops in international forums that build knowledge, professional relationships, and trust. We see joint actions such as standard or rule setting, foreign-exchange market intervention, and liquidity provision, as "coordination." Although coordination does not necessarily occur only in times of crisis, relationships built through diplomacy lay the ground work for coordination when a crisis occurs.

Most central bank interactions—whether they be in forums exclusive to central banks or joint with finance ministries—are an example of "minilateralism" as defined in Hampson and Heinbecker (2011). In minilateralism, "cooperation is promoted and advanced through smaller group interactions that typically involve the most powerful actors in the international system" (p. 301).[8] Our study follows this model; therefore, we focus on central banks in the advanced economies and, more recently, those in major emerging market economies. The decisions that arise from these minilateral forums can be seen as a type of "soft law" in that these forums generally have no formal rules of membership, are granted no specific authority, and have no formal decision-making processes or procedures for resolution of disputes.[9] One example of soft law is the G-5's Plaza Accord in 1985, which had no binding legal standing, but whose announcement has been interpreted as a public commitment device to lower the value of the US dollar through concerted foreign-exchange intervention.[10]

The paper is organized as follows: In the next section, we discuss the most important forums or organizations through which central banks have engaged in diplomacy. We then discuss the mobilization of coordination through diplomacy using three examples over the past 30 years: the Plaza Accord in 1985 negotiated by the G-5; the response to the Asian financial crisis in 1997-98, led by the International Monetary Fund (IMF) with heavy participation from G-7 finance

[8] Hampson and Heinbecker (2011) note that these minilateralist forums tend to be more decisive and efficient but less broadly accountable compared with large, more representative forums. "Plurilateralism" might be a better term, as the countries involved can be quite powerful and large—such forums are "mini" only in the sense that some countries have been excluded.

[9] For a discussion of hard and soft law in international governance, see Abbott and Snidal (2000).

[10] Feldstein (1988, p. 10) argues that the system of government matters in that the separation of powers in the United States limits the authority of the US Treasury Secretary in international macroeconomic policy coordination relative to finance ministers from countries with parliamentary systems, particularly with respect to federal spending or taxes.

ministries and central banks; and the response to the global financial crisis that began in 2007. In each of these examples, we provide the economic circumstances at the time, discuss how the response was mobilized, and evaluate its success. An important take-away is that the major diplomacy bodies have tended to evolve in the aftermath of crises. In the concluding section, we use the lens of diplomacy and coordination to trace out the path for central bank diplomacy going forward.

II. Diplomacy

"Diplomacy is the art of telling people to go to hell in such a way that they ask for directions." (Winston Churchill)

There are a multitude of international forums in which central banks participate, some of them high-profile (for example, G-7 or G-20 meetings of finance ministers and central bank governors) and others that are more private and less subject to public scrutiny (meetings at the Bank for International Settlements, for instance). Despite advances in openness and transparency of central banks over the past two decades, the volume of central bank interactions and the multitude of forums is greatly underappreciated.

In a recent speech, Ben Bernanke recounted the extensive consultations among central banks during the time he served as Chairman of the Federal Reserve, including meetings with about 50 central bank governors six times a year at the Bank for International Settlements (BIS). He noted that these meetings were "of sufficient importance to the Fed that FOMC meetings are rescheduled to make sure they don't conflict."[11] In addition to meetings at the BIS, there were "international meetings that involve both central bank governors and finance ministers, including the G-20, which meets all around the world several times a year, G-7, the other Gs, and also, of course, the IMF meetings typically here in Washington and sometimes elsewhere, where you gather together the policymakers from the finance ministries and central banks from around the world" as well as "many other forms of consultation, calls, conference calls, bilateral calls, bilateral meetings, staff meetings, and the like." Not only were these consultations extensive, but they also included a discussion of prospective policies, not just of actions already taken, so that "policies are not made in isolation"—a point that may not be entirely clear to the general public.

[11] Bernanke (2015b).

Our aim here is to provide an overview of the forums to which Bernanke alludes, those that historically have been or today are the most important for international dialogue involving central banks. We leave aside the various regional groupings such as the Centro de Estudios Monetarios Latinamericos (CEMLA), founded in 1952 to promote policy dialogue and training in Latin America and the Caribbean; and the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP), founded in 1991, which in addition to the traditional information exchange has several bodies devoted to the discussion of crisis management, financial stability, and supervisory issues.[12] (Given the importance and idiosyncratic nature of Asian regional cooperation, we address that topic in a later section.) While these regional groupings are important, particularly for establishing regional solidarity and providing a counterweight to international institutions and the world's most influential central banks, they have not operated at the helm of crisis response and resolution to date.

Working Party Three and the Group of Ten

Working Party Three (WP3), a subcommittee of the Economic Policy Committee (EPC) at the Organization for Economic Cooperation and Development (OECD) is one of the oldest forums for finance ministry and central bank dialogue. The OECD, established in September 1961 as the successor to the Organization for European Economic Cooperation, is an international institution with 34 member countries that provides economic analysis and a venue for meetings of government officials. WP3 was founded to analyze "international payments of monetary, fiscal and other policy measures" and consult "on policy measures, both national and international, as they relate to international payments equilibrium."[13] From its inaugural meeting in 1961, WP3 was a macroeconomic talk-shop for representatives of finance ministries and central banks from 10 industrial countries—the most important forum of its kind until the mid-1970s.[14] In 1962, the members of WP3 met separately as the G-10 to establish the General

[12] CEMLA is the oldest regional association of central banks; current membership includes 49 central banks. There are 11 member central banks in EMEAP, including the People's Bank of China.

[13] See OECD, http://www.oecd.org/general/2504075.pdf, p. 39.

[14] The original G-10 included: Belgium, Canada, France, West Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, and United States. Switzerland became part of the group in 1964, although the grouping kept its name as "G-10." See Bergsten and Henning (1996) for a history of WP3. WP3 is still considered an important talk-shop; for example, the current Federal Reserve Board Vice Chair heads the WP3, and other U.S. participants include the U.S. Treasury Under Secretary for International Affairs, a member of the Council of Economic Advisers, and a Federal Reserve Board Governor.

Arrangements to Borrow (GAB), a set of bilateral standing arrangements that provided the IMF with additional resources to lend (initially only to countries in the G-10) in extraordinary circumstances.[15] The BIS hosted that meeting of the G-10 and, according to Borio and Toniolo (2008, pp. 43-44), central bank governors were already meeting regularly in Basel and the BIS provided technical and staff support for "an increasing number of official and semi-official 'groups,' sometimes made up of both government and central bank officials" from the 1950s onward. Baker (2006) reports that finance ministries and central banks of G-10 countries met regularly from the early 1960s until the collapse of the Bretton Woods system in 1973.

Other G-groupings[16]

The origin of the G-5 and later G-7 groupings dates to the spring of 1973 when the U.S. Treasury Secretary met together with the finance ministers of France, West Germany, and the United Kingdom in the library of the White House to discuss the international financial system after the collapse of the Bretton Woods system of fixed exchange rates. In calling together the "Library Group," the U.S. was seeking a more candid and informal grouping less dominated by European countries than the G-10; at another meeting in the fall of 1973, which included the Japanese finance minister, the G-5 finance ministers agreed to meet regularly. Federal Reserve Chairman Arthur Burns attended the next meeting and set a precedent for the inclusion of central bank governors. According to Baker (2006, pp. 24-25), "the beginnings of the G-5 (later to become the G-7) process were heavily informal, somewhat ad hoc and had an incremental and evolutionary dynamic" that relied on "personal networks and shared understandings." The group issued no communiqués after its meetings until 1985—indeed, its meetings were held in secret. Although the meetings of heads of state or government—known as "leaders' level" summits—had expanded to include Canada and Italy by 1975, the grouping of finance ministers and central bank governors did not meet as the G-7 until 1986.

A process to expand the club of finance ministers and central bank governors to include a broader set of countries began in the late 1990s at the behest of APEC leaders and President

[15] Bergsten and Henning (1996) regard the formation of the G-10 as a victory for the Europeans who viewed the IMF as a US-dominated institution; extensions under the GAB were not an IMF decision. Switzerland did not join the GAB until 1964 (http://www.imf.org/external/np/exr/facts/groups.htm#G10).
[16] For background on the assorted G-groupings, see Baker (2013).

Clinton amid a financial crisis in Asia.[17] In 1998, ministers and governors convened a meeting of the G-22 (initially known as the "Willard Group" because their first meeting took place in the Willard Hotel in Washington, D.C.) to discuss prospective reforms to the architecture of the international financial system.[18] Over the course of 1998 and 1999, the G-22 and its various working groups made a number of proposals, including the creation of a Financial Stability Forum (FSF). The FSF was established by the G-7 in early 1999 "to ensure that national and international authorities and relevant international supervisory bodies and expert groupings can more effectively foster and coordinate their respective responsibilities to promote international financial stability, improve the functioning of the markets and reduce systemic risk" and, although initially convened at the G-7 level, was intended to become more inclusive over time.[19] The FSF comprised representatives from not only finance ministries and central banks but also supervisory authorities and other financial authorities; a small secretariat for the FSF was housed at the BIS in Basel.

In addition, the G-7 tasked a somewhat larger group of countries with reviewing some of the G-22's proposals and this G-33 met twice in the spring of 1999.[20] Kharas and Lombardi (2012) report that efforts then began to transform the G-33 into a smaller, more manageable, and less Asian grouping that would, at the same time, satisfy the need for a forum broader than the seven industrial powers.[21] This was achieved in September 1999 when the G-7 finance ministers and central bank governors announced the formation of the G-20,[22] with their communiqué stating that this new forum would "broaden the discussions on key economic and financial policy issues among systemically significant economies and promote cooperation to achieve stable and

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[17] The G-7 leaders' summit expanded to eight members with Russia in the mid-1990s, but the grouping of finance ministers and central bank governors remained unchanged.

[18] The G-22 added 15 countries to the G-7: Argentina, Australia, Brazil, China, Hong Kong, India, Indonesia, South Korea, Malaysia, Mexico, Poland, Russia, Singapore, South Africa, and Thailand. The G-22 was intended from the start to be a temporary forum (http://www.imf.org/external/np/exr/facts/groups.htm#G22).

[19] Communiqué (1999). See Langdon and Promisel (2013) for a history of the FSF and its work.

[20] The G-33 added 11 countries to the G-22: Belgium, Chile, Côte d'Ivoire, Egypt, India, Morocco, Netherlands, Saudi Arabia, Spain, Sweden, and Turkey.

[21] There is a rich and interesting debate about global governance surrounding the G-22, G-33, and G-20 groupings. See Kharas and Lombardi (2012) and the references therein.

[22] The G-20 comprised 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, and United States) and a representative of the European Union.

sustainable world economic growth that benefits all."[23] However, from the start, some were skeptical about whether the G-7 was using the G-20 to legitimate its discussions.[24]

After quiet initial years, the G-20 finance and central bank forum began to coordinate more closely beginning in the fall of 2007 as signs of what was to become the global financial crisis began to emerge. We defer the discussion of these actions to the next section, but note that as the importance of the G-20 grew, it began meeting at the leaders' level in fall 2008 and assumed a central role in the policy response that unfolded over the course of several summit meetings.

The Bank for International Settlements

The BIS is the oldest multilateral central banking institution, unusual in both its history and the fact that its members are central banks, not governments. Founded in 1930 as part of the Young Plan, the BIS was established to administer Germany's World War I reparations payments consistent with the statutory objective to act as a trustee or agent for international financial payments.[25] In this capacity, the BIS acts as a bank for central banks.[26] However, another statutory objective directs it "to promote the cooperation of central banks and to provide additional facilities for international financial operations." Cooper (2008, pp. 82-83) writes that this "convening function was exercised at once, as governors of the equity-holding central banks gathered once a year, and their representatives gathered almost monthly from the opening of the BIS in April 1930."

The BIS has a fascinating early history that is worthy of a brief review. Americans played a central role in the committee that negotiated the Young Plan and established the BIS, but the U.S. government was officially opposed to linking Germany's reparations payments and the Allied war debt owed to the United States.[27] Prominent private financiers—including J.P.

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[23] Canada (1999).

[24] Kirton (1999) writes: "One doubt arises from the view of some who see the G20 as part of the 'G7-ization' of the world. In this view, the G20 was born to legitimate G7 initiatives to the wider world, by securing a broader consensus for G7-generated ideas. The G20's eleven non-G7 members are thus destined to affect issues merely on the margin, to be informed of G7 initiatives, and to be given some semblance of participation. The G20 underscores the fact that the G7 does not want to leave the reform of the international financial system to the IMF or World Bank, where developing countries have an institutionalized role."

[25] See Article 3 of the statutes: https://www.bis.org/about/statutes-en.pdf.

[26] Simmons (1993) notes that Montagu Norman, governor of the Bank of England at the time of the BIS' founding, referred to it repeatedly as a "club for central bankers" (p. 390).

[27] The Committee of Experts on Reparations—the so-called Young Committee, headed by American businessman Owen Young—met in 1929 to work out the rescheduling of Germany's reparations debt. The Young Committee

Morgan—and the Federal Reserve represented U.S. interests in the negotiations. Although seven countries were involved in the negotiations, only six central banks held equity when the new institution was created—Belgium, France, Germany, Italy, Japan, and the United Kingdom. The U.S. government would not permit the Federal Reserve System to occupy its seats on the BIS's Board of Directors, so the shares were held by a consortium of private banks.[28] (The Federal Reserve System did not take up its seats until 1994.)

The reparations function of the BIS did not last long. The onset of the Great Depression in late 1929 was followed by a breakdown in international trade (spurred by passage of the American Smoot-Hawley Tariff Act), and a prolonged period of nationalism and isolation. In 1931, President Hoover issued a moratorium on the payment of World War I reparations and debts, which were permanently suspended in 1932. Although the BIS adopted a "neutral" stance during the Second World War, it facilitated the transfer of gold from the Czech central bank to the Reichsbank[29] and accepted looted Belgian, Dutch, and "victim" gold deposits in the Reichsbank's account. At the Bretton Woods conference in 1944, a recommendation called for "liquidation" of the BIS "at the earliest possible date."[30]. Even though this recommendation was included in the Bretton Woods agreement, it proved impossible to carry forward. Despite the desire of Americans Harry Dexter White and Henry Morgenthau to dissolve the BIS, strong support from the central banks in Europe and John Maynard Keynes prevailed, and the BIS survived.

Since that time, the BIS has facilitated central bank operations and provided the forum for a wide range of technical discussions about central banking issues. In the 1950s, the BIS acted as agent for the clearing and settling of intra-European payments in the European Payments Union

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proposed creating an international bank to "commercialize" the reparations payments. See Simmons (1993) and Toniolo (2005, chapter 2) for detailed accounts. By commercializing the payments, reparations would be separated from politics, something that appealed to private bankers. Simmons (1993, p. 393) writes that "The United States government opposed any bank that would simply be a funnel for German reparations to pay off American war loans." Toniolo (2005) explains that although there was no formal link between Germany's reparations payments and the debt the Allied countries owed the United States, a linkage might create a "united European front" that could demand a reduction or repudiate the debt.

[28] The first two Chairmen of the BIS's Board of Directors were American (Gates McGarrah and Leon Fraser). The head of the Federal Reserve Bank of New York, George Harrison, favored keeping private bankers involved given that the U.S. government had blocked Federal Reserve participation in the BIS.

[29] The transfer of Czech gold occurred in March 1939 at the time of the German occupation of Czechoslovakia and prior to the outbreak of war later that year.

[30] This recommendation was submitted by the Norwegian delegation to Bretton Woods; see Toniolo (2005, p. 268).

(EPU).[31] In the 1960s, the BIS was at the center of central bank efforts to keep the price of gold in the free market trading near its official price in the Bretton Woods system, provide a line of credit to the Bank of England to prop up the pound sterling, and monitor developments in the emerging Eurocurrency market.[32] As noted earlier, it was also during those years that the central bank governors of the G-10 countries began to hold regular meetings at the BIS to review economic developments and monetary policy; the BIS also acted as agent for the G-10's GAB. In addition, in keeping with its historically European focus, the BIS played a central role in European monetary integration, initially by hosting a committee of central bank governors of the European Economic Community, starting in 1964, and later, beginning in 1993, by housing the European Monetary Institute, the precursor of the European Central Bank (ECB), which made the technical and operational plans necessary for Europe's monetary union.[33]

With the end of the Bretton Woods system in 1973, the BIS began to shift toward forums organized to address various financial-sector issues. Borio and Toniolo (2008) distinguish between crisis response, on the one hand, and work aimed at strengthening the financial system in order to make it less susceptible to crisis, on the other. The most prominent example of the latter during this period was the Basel Committee on Banking Supervision (BCBS), a standing committee established by, and originally reporting to, G-10 central bank governors.[34] The Committee first met in February 1975 following the collapse of a German bank (Bankhaus Herstatt)—an event that raised concerns about the fragility of fast-growing international financial markets. Since that time, the committee has evolved into the primary forum for central banks

[31] The EPU was the first multilateral arrangement for the clearing of payments related to international trade and was administered by the Organization of European Economic Cooperation in Paris, set up to assist the European recovery after World War II; see Triffin (1957).

[32] These are commonly known as the Gold Pool, the Sterling Group Arrangements, and the Standing Committee on the Eurocurrency Market, respectively.

[33] Siegman (1994) lists the "European character" of the BIS as one of the reasons that the United States did not assume its seat on the BIS's Board until 1994 (both the Chair of the Federal Reserve Board and the President of the Federal Reserve Bank of New York hold seats on the Board of Directors). In the early 1990s, the institution began expanding to include a number of non-European central banks. According to Siegman (p. 900), America's decision to take up representation "was made in recognition of the increasingly important role of the BIS as the principal forum for consultation, cooperation, and information exchange among central bankers and in anticipation of a broadening of that role."

[34] For a history of the BCBS's early years, see Goodhart (2011). As evidence of the limited nature of international coordination at the time, Goodhart (pp.45-46) reports that at the first meeting of the committee, none or hardly any of the participants around the table had met before.

and regulatory authorities to cooperate on banking supervisory matters.[35] Other BIS committees created during this period addressed payments and settlement systems, financial market functioning, and international banking statistics. To the extent that responsibility for these issues extended beyond central banks, the forums were opened up to other government authorities.

At times shifting from diplomacy to cooperation, these forums have yielded a number of well-known agreements on minimum capital standards for banks, core principles for banking supervision, and principles for the operation of settlement systems.[36] Borio and Toniolo (2008, pp. 64-65) point out that the codes and principles for the financial sector have relied upon "non-binding agreements reached by national authorities, implemented largely through peer-group pressure within national jurisdictions, possibly after adjustments to local law, and with the support of market forces"—that is, soft law. With regard to crisis response, the BIS has made financing commitments or carried out operations on a number of occasions to countries experiencing a financial crisis, often on behalf of the G-10 countries (examples include Mexico and Argentina during the Tequila Crisis in 1995 and Thailand in 1997, in advance of IMF lending).

Today the BIS has 60 member central banks. In terms of macroeconomic consultations, governors of 30 BIS members meet bimonthly at the Global Economy Meetings, which is supported by a smaller group of 18 governors on the Economic Consultative Committee. As noted earlier, the BIS houses the FSB and also provides facilities for international associations for insurance supervisors and deposit insurers.

III. Converting Talk into Action: Three Episodes of Coordination

"Good ideas are not adopted automatically. They must be driven into practice with courageous patience." (Hyman Rickover)

If the previous discussion lays out the institutional and legal structure of central bank coordination, what does that coordination look like in practice? We now turn to three important

[35] See BIS (2016). The Committee expanded its membership in 2009, again in 2014, and now includes 28 jurisdictions. Today the Committee reports to an oversight body composed of central bank governors and (non-central bank) heads of supervision from member countries.

[36] These were Basel I in 1988 and Basel II in 2004; the Core Principles for Effective Banking Supervision in 1997; and the Lamfalussy Report on wholesale net settlement systems in 1990.

episodes since the end of the Bretton Woods system in which relationships created through diplomacy have provided a springboard for action, streamlining our discussion to focus as much as possible on the role played by central banks.

The Plaza Accord

The economic circumstances that propelled the dollar's exchange value upward in the early 1980s are clear: A substantial tightening in monetary policy from the Volcker-led Federal Reserve beginning in fall 1979 combined with a doubling of the federal fiscal deficit as a share of GDP during the first Reagan Administration to push U.S. interest rates higher (both in level terms and relative to foreign interest rates), attracting flows of foreign capital into the United States and appreciating the dollar.[37] Between July 1980 and June 1984—the peak of the differential between U.S. and foreign interest rates—the dollar appreciated 36 percent in nominal terms relative to other major currencies (the red line in Figure 1). Thereafter, the dollar continued to rise despite a moderation in the interest differential, peaking in March 1985 at a level almost 55 percent above its value in the summer of 1980.[38] The appreciation of the price-adjusted or "real" dollar mirrored that of the nominal dollar (the blue line). Williamson (1985) estimates that by late February or early March 1985, the dollar was more than 40 percent above its fundamental equilibrium value. It is no wonder then that the U.S. current account swung from near balance in 1981 to a deficit position that reached nearly 2½ percent of GDP by 1984 (see Figure 2), or that major corporations and business organizations engaged in international trade called initially for actions to reverse the dollar's rise and later on lobbied for protectionist measures.[39]

The U.S. Treasury made clear from early 1981 that it would take a "hands-off" approach to exchange-rate policy, consistent with the free-market, noninterventionist beliefs of its Undersecretary for Monetary Affairs, Beryl Sprinkel.[40] There would be no regularized intervention in foreign-exchange markets; intervention would occur only in the event of

[37] Many studies provide detailed accounts of these economic developments; see Frankel (1994) and Bordo, Humpage, and Schwartz (2015).
[38] The rise between June 1984 and March 1985 is often viewed as a "bubble," because the movement in economic fundamentals over that period did not support the dollar's continued appreciation.
[39] See the accounts in Destler and Henning (1989) and Frankel (1994).
[40] For in-depth descriptions of the political climate in the first Reagan Administration, see Destler and Henning (1989), Frankel (1994), and Truman (2016b).

disorderly financial market conditions.[41] Furthermore, Treasury officials did not link the dollar's rise to high interest rates and the growing U.S. fiscal deficit, but rather to the favorable investment conditions created by tax and regulatory changes.[42] Although the Federal Reserve had concerns about the dollar and the twin deficits, Volcker saw exchange-rate policy as the purview of the Treasury (even though the Federal Reserve has independent legal authority for conducting foreign-exchange operations) and the Federal Reserve Chairman preferred to share his concerns privately with Secretary Regan.[43] And, as the Federal Reserve's primary focus was bringing inflation down from double-digit levels, an appreciating dollar was helpful—at least until the misalignment became extreme.[44]

In the international arena, the dollar's value and the U.S. fiscal-monetary policy mix received substantial attention. At the 1982 G-7 leaders' summit in Versailles, the French argued that foreign-exchange intervention was a useful tool for countering exchange-rate misalignment—a view quite contrary to that held by the Americans. The Germans must have concurred with the

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[41] Sprinkel formally communicated this during Congressional testimony in April 1981. According to Truman (2016a), Volcker had reviewed Sprinkel's remarks beforehand and ensured that the minimalist approach included the possibility of responding to disorderly market conditions.

[42] Other officials in the Reagan Administration took a different view. Martin Feldstein, head of the President's Council of Economic Advisers (CEA) from 1982 to 1984, linked the high interest rates and fiscal deficit to the dollar's rise and widening current account deficit—the "twin deficits" view that is widely accepted today (see Frankel, 1994). While Feldstein made his views known, he had no formal authority over budget or exchange-rate policy. Bordo, Humpage, and Schwartz (2015) observe that before 1985, there were few Administration officials who worried about the dollar's appreciation because they viewed the crowding out of exports that resulted as preferable to the traditional form of crowding out that results from an increase in the fiscal deficit. As evidence, the authors (p. 273) point to the CEA's 1984 *Economic Report of the President* as suggesting "that the investment sector contributed more to potential economic growth than the traded-goods sector, and that higher potential growth eased inflationary conditions."

[43] See Volcker and Gyohten (1992), pp. 238-239; Truman (2016a), p. 19; Truman (2016b), p. 143. Destler and Henning (1989) argue that Volcker was reluctant to criticize the Treasury publicly because the Federal Reserve was being attacked for running a very stringent monetary policy. Bordo, Humpage, and Schwartz (2015, pp. 278-279) claim that Volcker "briefly considered, but rejected, intervening without the Treasury's participation," fearing a political backlash. The account in Volcker and Gyohten (1992) casts doubt on that view and suggests that Volcker would have been extremely reluctant to intervene without Treasury participation (see pp. 234-235). The legal authority for conducting foreign-exchange operations is in Section 14(1) of the Federal Reserve Act, which authorizes Federal Reserve Banks to buy and sell cable transfers in the open market; in its annual Authorization for Foreign Currency Operations, paragraph 1(A), the Federal Open Market Committee authorizes and directs the purchase and sale of "foreign currencies in the form of cable transfers through spot or forward transactions on the open market at home and abroad, including transactions with the U.S. Treasury, with the U.S. Exchange Stabilization Fund …" (Federal Reserve, 2016). When the Federal Reserve Act was drafted in 1913, international currency transactions were carried out via cable.

[44] In his address at a conference on the Plaza Accord, Volcker indicated that by the time the Accord was agreed, he thought a "sizable realignment" of the dollar was necessary and that he wanted to avoid a "free fall," which could be abrupt and disorderly. See Green (2016).

French because, by this time, the Bundesbank had been intervening heavily to stem the fall in the German mark.[45] The leaders agreed to establish an inter-governmental working group to study the effectiveness of intervention; the report produced by the group, known as the Jurgensen report, was presented at the leaders' summit meeting in Williamsburg the following year.[46]

According to Truman (2016b), the working group, which was composed of finance ministry and central bank representatives, met 10 times and produced more than a dozen studies on foreign-exchange intervention—many of them written at the Federal Reserve.[47] A key question concerned the effectiveness of sterilized intervention—that is, intervention that does not alter the monetary base.[48] The working group's studies provided evidence that sterilized intervention can have small, transitory effects on exchange rates and that coordinated intervention was more powerful than intervention by a single country. Bordo, Humpage, and Schwartz (2015, pp. 277) write that around the time of the Jurgensen report, "the weight of the evidence [from the working group's studies as well as other research] did not rule out sterilized intervention, but it appeared to shift against a portfolio-balance channel and toward a narrowly defined signaling channel; that is, intervention as a signal of future monetary-policy changes."[49] Truman (2016b, pp. 140-143) sees the Jurgensen report as having "contributed to a better understanding in official circles of the distinction between sterilized and unsterilized intervention" and set the stage for later cooperation "in particular with respect to coordinated operations and signaling official attitudes to the market."[50]

The Plaza Agreement in 1985 is widely regarded as a success in terms of cooperation—Paul Volcker writes that it was the "most aggressive and persistent effort to guide exchange rates on

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[45] According to Bordo, Humpage, and Schwartz (2015), "many countries" had been using nonsterilized intervention to put upward pressure on their currencies vis a vis the dollar.
[46] The *Report of the Working Group 1983* was written by the Working Group on Exchange Market Intervention, whose chair, Philippe Jurgensen, was a French Treasury official.
[47] Eight of the studies were written by economists in the Federal Reserve System. See Henderson and Sampson, (1983).
[48] This was an important issue because some central banks would have been opposed to unsterilized intervention, which would have altered the monetary base and had implications for inflation—for example, selling dollars and buying foreign currencies would have increased the U.S. monetary base and put upward pressure on inflation at a time when the Federal Reserve was trying to reduce it.
[49] See Dominguez (2008) for a discussion of sterilization and a more recent review of the efficacy of sterilized intervention; see also Frankel (2016).
[50] Frankel (2016, p. 56) says the Jurgensen Report was "not quite as supportive of intervention as the other countries had hoped."

both a transatlantic and transpacific scale since floating had begun more than a decade earlier"—even if there is some controversy about whether or by how much the announcement contributed to the dollar's decline.[51] Most detailed accounts see the Plaza Agreement as the culmination of a process that began earlier in the year, following the change in leadership at the U.S. Treasury.[52] The new Secretary, James Baker, in his confirmation hearing before the Congress in January 1985, signaled a possible change in attitude toward foreign-exchange intervention, saying that the Administration's posture was "obviously something that should be looked at because some will argue that that [intervention] could have a dramatic effect on the value of the dollar" (quoted in Destler and Henning, 1989, p. 42). Even before the formal change in Treasury personnel, however, G-5 finance ministers and central bank governors met and released a statement indicating their willingness "to undertake coordinated intervention in the markets as necessary."[53] Some coordinated intervention followed from mid-January through early March, with the German and Japanese central banks selling dollars and the Federal Reserve buying marks, yen, and sterling.[54] Frankel (1994) sees the Bundesbank's large sales of dollars over two days in late February as having been the trigger for the dollar's reversal, while others see the intervention—which on the whole was relatively small—as not having been particularly noteworthy.[55] Whatever the case, the dollar peaked in late February and began to depreciate fairly steadily, falling nearly 11 percent in nominal terms before the Plaza meeting.[56]

The road to the Plaza Accord had begun over the summer, with the deputies in the G-5 finance ministries and central banks holding several secret meetings in the run-up to September 22. In

[51] Volcker and Gyohten (1992), p. 229.
[52] See Frankel (1994). Frankel (2016, p. 57) writes, "my view is that it is appropriate to use the term [Plaza Accord] to include all the elements of the shift in dollar policy that occurred when Baker became Treasury Secretary, including other meetings, public statements, perceptions, and—especially—foreign exchange market intervention."
[53] The G-5 met on January 17.
[54] The Federal Reserve generally intervened only in German marks and Japanese yen (the Open Market Desk at the Federal Reserve Bank of New York undertakes all U.S. intervention operations on behalf of the Treasury and Federal Reserve). Changes in the dollar-mark exchange rate had ramifications for other currencies—such as the French franc—that were linked to the mark through the Exchange Rate Mechanism of the European Monetary System. Bordo, Humpage, and Schwartz (2015) characterize the intervention in sterling as a political gesture prior to Margaret Thatcher's official visit to the United States.
[55] See Bordo, Humpage, and Schwartz (2015). Truman (2016a) terms the intervention "substantial," but does not see it as the trigger for the dollar's reversal.
[56] Frankel (1994, p. 303) writes that "German authorities could claim credit for the reversal of [intervention] policy," but that Baker got all the credit instead. It should be noted that the dollar did reverse course and appreciated from late August until the time of the Plaza meeting in September.

recent remarks, James Baker referred to the "serious protectionist fever burning in Congress" as the impetus for the discussions and indicated that, at the beginning of the secret meetings, the other G-5 governments expressed "predictable skepticism" (Baker, 2016). But Truman (2016b) reports that by the summer of 1985, Secretary Baker had the support of the U.S. Secretary of State and officials of the other G-5 governments to take action to bring the dollar down.[57] The communiqué issued at the end of the meeting stated:[58]

> "The Ministers and Governors agreed that exchange rates should play a role in adjusting external imbalances. In order to do this, exchange rates should better reflect fundamental economic conditions than has been the case. They believe that agreed policy actions must be implemented and reinforced to improve the fundamentals further, and that in view of the present and prospective changes in fundamentals, some further orderly appreciation of the main non-dollar currencies against the dollar is desirable. They stand ready to cooperate more closely to encourage this when to do so would be helpful."

The dollar fell sharply upon the Plaza announcement[59] but, by early October, had returned to the pace of steady, gradual depreciation that it had followed earlier in the year. Judged in terms of politics and coordination, the Plaza was a great success. If you view the entire year of 1985 as a "Plaza period," as Frankel does, then the sea-change in U.S. attitudes and subsequent coordinated actions that put the dollar on a downward path also make the Plaza a success. But for those who are skeptical that sterilized intervention can have lasting effects and who view the Plaza as a one-time event in September, then it is more difficult to see that the agreement produced more than a hiccup in the dollar's decline.[60]

Let's turn now to the Plaza Agreement as an example of coordination built through diplomatic relationships, and the role of central banks in it. First, there is no doubt that getting to Plaza required coordination and a working network of G-5 relationships. Obviously, the change in U.S. attitudes at the start of 1985 was fundamental; also fundamental was the extent of the dollar's overvaluation and the protectionist climate that it brought out. Second, as a result of Plaza, the diplomatic grouping of finance ministers and central bank governors was expanded in

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[57] Volcker reports that he was "not in on the ground floor" but "was brought into the discussions only in August, when the ideas were becoming more operational." See Volcker and Gyohten (1992), p. 242.
[58] Announcement (1985). According to Funabashi (1988) and Frankel (1994), the deputies agreed to a "nonpaper" that specified a 10-12 percent depreciation of the dollar (with up to $18 billion in intervention).
[59] The weighted-average dollar fell 4 percent on the day after the Plaza announcement.
[60] For the skeptical view of Plaza's effects, see Feldstein (1988); Bordo, Humpage, and Schwartz (2015); and Taylor (2015).

1986 to include Italy and Canada. Baker (2006, pp. 25-26) links the expansion of the G-5 grouping to the formal announcement of and publicity surrounding the Plaza Accord, which resulted in pressure to align the membership with that of the leaders' grouping.[61] Thus, the Plaza produced an evolution—albeit a small one—in a major diplomatic forum, a point that is central to our view that the forums are elastic to events.

Finally, central banks played a critical role in this episode through their contributions to the Jurgensen report and the execution of intervention operations, but their involvement in and support for the Plaza Agreement itself is more equivocal. Truman (2016b) reports that central banks were brought into the secret discussions late—around the time the deputies began discussing the operational issues associated with the planned intervention.[62] As a result, "the Federal Reserve, along with other central banks, did not have ownership of, and therefore commitment to, the substance of the Plaza Accord."[63] There was no doubt some tension between independent central banks concerned with price stability (notably the Bundesbank and Federal Reserve) and finance ministries with other objectives—particularly the U.S. Treasury that favored coordinated interest rate cuts to fuel economic growth.[64] Volcker and Karl Otto Pöhl were both concerned that the dollar's decline could be rapid and unruly, and so insisted on the insertion of "orderly" in the Plaza announcement.[65] Destler and Henning (1989, p. 50) write that the "consensus over the desired direction of exchange rate movement evaporated" well

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[61] Until 1985, the G-5 meetings of finance ministers and central banks governors were not made public or covered by the press. The January 17, 1985 meeting marked the first issuance of a statement. Historical information is also provided in Bergsten and Henning (1996), Kharas and Lombardi (2012).

[62] Funabashi (1988) reports that the very early discussions were done on a bilateral basis between the U.S. Treasury and the finance ministries of Japan and Germany.

[63] Truman (2016b), p. 148.

[64] Indeed, at the bottom of the statement, each country listed several goals. France, Germany, the United Kingdom, and United States specified stable prices, disinflation, or price stability as an objective, while Japan specified "the flexible management of monetary policy with due attention to the yen rate."

[65] See Funabashi (1988) and Truman (2016a). In Green (2016), Volcker indicates that he had not been "an enthusiastic proponent" of the Plaza Agreement; he thought the dollar would depreciate on its own and wanted "to avoid a free fall."

before the end of 1985.[66] Secretary Baker continued to pursue an activist agenda of international coordination during Reagan's second term.[67]

Asian Financial Crisis and the Road to the G-20

The growing power of emerging markets during the 1990s created enormous strains for the guardians of the world's economic architecture. Globalization, combined with the rapid growth of international financial markets, brought new financial actors to the table and made diplomacy and coordination with those actors far more complex and consequential. Further, at times of crisis, these new rising powers would need to be part of the coordinated international response. In particular, financial rescue packages for countries in trouble were growing in scale and becoming increasingly likely to outstrip the capacity of the IMF, acting alone, to address. These developments created new pressures on central banks to broaden their horizons and engage in new forms of diplomacy. Notably, Truman (2016a) argues that it was primarily the Federal Reserve's involvement in external financial crises during the decade—first Mexico in 1994 and then the Asia crisis—that led the Federal Reserve to become increasingly engaged with countries and their central banks outside of the traditional circle of the G-10 plus Mexico.[68] In the early 1990s, the G-7 was the primary forum where emerging market issues were discussed. Still, the importance of bringing the major emerging market countries more fully to the table was increasingly recognized, and there were occasional efforts by the leading central banks to reach out to their emerging market counterparts. The focal point of outreach was Asia, where rapid growth was raising expectations that the region was set to play a leading role in the global

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[66] Pöhl was quoted in the *Wall Street Journal* two weeks after the Plaza Accord as saying that the level of the dollar was "acceptable to us" (Destler and Henning, 1989, p. 50). Volcker was quoted in the Washington Post around the same time as saying "one could have too much of a good thing" (Truman, 2016b, p. 154).

[67] Secretary Baker wanted other major countries to stimulate their economies through monetary and/or fiscal policy, thereby increasing demand for U.S. exports and reducing the trade and current account deficits; an alternative to stimulative macroeconomic policies was a further depreciation of the dollar. From 1986, Baker pursued various other initiatives aimed at policy coordination. These included a set of objective macro indicators announced at the May 1986 G-7 leaders' summit (with the intention of setting goals for the indicator variables); the Baker-Miyazawa agreement announced later in 1986 (to stabilize the yen-dollar rate as a quid pro quo for Japanese fiscal expansion); the Louvre Accord in February 1987 intended to stabilize exchange rates near then-current levels (and that reportedly included target zones that were agreed but not announced). See Funabashi (1988), Destler and Henning (1989), and Frankel (1994).

[68] The Federal Reserve facilitated the operation of the Exchange Stabilization Fund as part of the 1995 U.S. Treasury- and IMF-backed rescue package for Mexico, which also led to a rethink of the international financial architecture that played an important role in the central bank's response to the Asia crisis.

economy. Still, prior to the onset of the Asia crisis, the primary forums for central bank communication and diplomacy remained dominated by the industrial countries.

Among Asian central banks, there was a parallel effort during this period to strengthen regional cooperation, but the overall effect in terms of developing a regional voice was limited prior to the crisis. In addition to regional integration efforts oriented around the Association of South East Asian Nations (ASEAN)[69] and the ASEAN countries together with China, Japan, and South Korea (a grouping known as ASEAN+3), central bank cooperation was primarily conducted through three bodies: Executives' Meeting of East Asian-Pacific Central Banks (EMEAP),[70] the South East Asian Central Banks Research and Training Center (SEACEN),[71] and Central Banks of Southeast Asia, New Zealand, and Australia (SEANZA).[72] While leaders provided repeated political support for these initiatives, by the mid-1990s there was a broad consensus that efforts at regional integration had run out of steam and were inadequate to meaningfully address regional economic dislocations. Further, the existence of overlapping groups, with different country memberships and similar but at times competing mandates, underscored the difficulty of achieving effective coordination within the region.

Against this backdrop, the Asian financial crisis was a dramatic challenge to global policymakers' capacity to coordinate their responses to crises. The onset of the crisis is traditionally dated as July 2, 1997, when the Thai government abandoned its peg of the baht against the U.S. dollar.[73] As shocking and unexpected as that move was, in retrospect it is clear

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[69] At its founding in 1967, ASEAN was composed of Indonesia, Malaysia, the Philippines, Singapore, and Thailand; by the time of the Asian financial crisis, there were four additional members—Brunei, Laos, Myanmar, and Vietnam; Cambodia joined in 1999. Economic integration through ASEAN was based on trade integration, but in 1977 was extended to include liquidity provision when the central banks of Indonesia, the Philippines, Malaysia, Thailand, and Singapore created the first regional swap arrangement (ASEAN Swap Arrangements or ASA). Originally for $100 million, it was expanded to $200 million in 1978 and was activated five times in the late 1970s and early 1980s. See Henning (2002), pp. 14-15.

[70] EMEAP was founded in 1991 and consists of Australia, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, and Thailand.

[71] SEACEN began as an informal annual meeting of seven regional central bank governors in 1966 (Laos, Malaysia, the Philippines, Singapore, Sri Lanka, Thailand, and Vietnam) and commenced holding training programs in 1972; in 1982, agreement was reached formally creating the South East Asian Central Banks Research and Training Center. It now has 20 members, including notably from outside of the founding countries of ASEAN, China, Korea, and India.

[72] Created in 1956, SEANZA includes central banks of Southeast Asia, New Zealand, and Australia, is composed of 20 countries, and focuses primarily on information exchange and training events hosted by member countries on a rotating basis. In 1984, the SEANZA Forum of Banking Supervisors was established.

[73] The baht closed the day down nearly 17 percent against the U.S. dollar in offshore trading.

that warning signs had been apparent for some time not only in Thailand but throughout the region. A private sector-led investment boom during the 1990s fueled large increases in current account deficits, rising debt levels (much of it in foreign currencies and of short duration), and real appreciations that over time raised growing concerns about sustainability.[74] Most of the region had exchange rates that were effectively—even if not formally—fixed or semi-fixed. This meant that as sentiment turned in late 1996 and early 1997, and capital flows began to reverse, exchange rates came under pressure (see Figure 3). Further, close ties between banks and the firms that they lent to and expectations of state support further distorted incentives.[75]

Among policymakers, concerns were raised, though not with the strength and focus needed to mobilize action. Boughton (2012, chapter 11) argues that, beginning in 1995 and intensifying in late 1996-97, IMF management expressed their concerns privately to Asian policymakers and, in general terms, in a number of speeches. But such concerns, while often expressed, were not with the urgency needed to break through. It has often been noted that Asian policymakers saw little reason for concern. Decades of high growth rates had bred strong conviction in the success and stability of the "Asian economic miracle," and without the need for IMF resources there was a deep resistance throughout Asia to adopting IMF recipes.[76]

Investors began to turn against these countries in the summer of 1996, and the outflows of private capital intensified in September 1996, when Moody's Investors Service downgraded its rating on Thailand's short-term external debt.[77] Following the decision by Thailand to borrow from the IMF and float its currency in 1997, shockwaves spread quickly through the region, and Indonesia and the Philippines also had to turn to the IMF for financial assistance in the following months. As Truman (2013) aptly comments, "few anticipated that a crisis in Thailand would be as severe as it proved to be or the extent to which other countries in Asia had their own vulnerabilities and were susceptible to a change in investor appetites."[78]

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[74] For example, see Camdessus (1997).
[75] In contrast with most developing country debt crises of the 1970s and 1980s, public sector deficits were not the primary problem in Asia. See, for example, Roubini and Setser (2004).
[76] See World Bank (1993); for a post-crisis assessment from the IMF, see Kato (2004).
[77] See Boughton (2012), chapter 11, and Blustein (2001). See also the Nukul Commission report (1998), p. 43.
[78] Truman (2013), p. 187.

In the early stages of the crisis, central bank efforts focused on supporting the development of adjustment programs and the mobilization of financial support for those programs. The first line of defense within the region came from financing packages from governments and central banks intended to complement funds from the IMF and other multilateral sources. An August 1997 "Friends of Thailand" meeting organized by Japan's Ministry of Finance resulted in $9 billion in support from governments in the region plus financing from a number of central banks including the People's Bank of China. For Indonesia, a group of central banks (China, Japan, and the United States, as well as some regional central banks) agreed to a "second line" of assistance should unexpected adverse developments occur.[79] In addition, in the early days of the program, the central banks of Indonesia, Japan, and Singapore conducted large-scale, foreign exchange intervention to support the rupiah.

In contrast, throughout the crisis, existing Asian central bank emergency swap lines were not activated, as the amounts available under the programs were small and the pressure to put together large, internationally supported packages led lending countries to rely on other approaches. Further, to some extent regional policymakers were overwhelmed by the scale of the crisis confronting them, making policy coordination challenging on a regional basis.

The next important step forward in central bank diplomacy took place in December 1997, with an extraordinary effort to coordinate a rollover of loans made by banks around the world to banks in Korea. The Korean crisis had built slowly over the summer as economic performance deteriorated and markets became extremely skittish over Korea's mounting foreign debt and large current account deficit, but it intensified following the floating of the Taiwan dollar and sharp sell-off in the Hong Kong stock market in mid-October. By the end of October, Korean equities were down 40 percent from early August, and the won was falling sharply against the dollar. The rout was on.[80]

An initial IMF program, totaling $21 billion over three years, was announced on December 7, and the announcement stressed that, with bilateral assistance, the package would total $55 billion. Still, the initial disbursement was small—$5.6 billion—and questions were immediately raised about the overall adequacy of financing; a tightly contested election campaign in Korea

[79] That commitment never materialized, as financing needs were met multilaterally.
[80] See Boughton (2012), pp. 544-545.

raised questions about the durability of the program. The Korean central bank's reserves were falling by nearly $1 billion per day, a pace that would exhaust them by month-end. In drawing up a replacement program (eventually approved on December 30, 1997), policymakers decided that the official community was unwilling to finance the continued rapid outflow of capital.

On December 23, 1997, after a conference call of IMF management with the deputies of the G-7 finance ministers and central bank governors, it was decided that a standstill of commercial bank lines would need to be attempted.[81] According to Boughton (2012), the subsequent public announcement indicated that "central banks would coordinate the debt rollovers internationally and make sure that aggregate exposure was being maintained." In the following days, U.S. Treasury Secretary Robert Rubin telephoned the heads of the major international banks,[82] and IMF and U.S. government officials met with the banks in a meeting organized and hosted by the Federal Reserve Bank of New York. This publicized and carefully orchestrated campaign sent a clear signal of the importance that the official community placed on the success of the operation.

Through the initial set of meetings, central banks largely remained in the shadows, concerned about their regulatory role and how such an explicit effort at moral suasion would be received. But the operation of the rollover was the responsibility of central banks, which coordinated their efforts to press commercial banks in their jurisdiction to maintain exposure. The IMF's role in the standstill was to help the Bank of Korea develop a real-time monitoring system to track the amount of debt that was maturing each day, along with the amount that was being rolled over. Once that data was collected and analyzed, a daily conference call took place to brief central bank representatives. While the initial data was suspect, within a week the data was strong enough to support a substantial central bank moral suasion effort, and capital flows quickly stabilized and rollover rates rose steadily over the next few months.[83] In addition, the substantial package of economic measures that the Korean government undertook contributed to the restoration of confidence, paving the way for an agreement converting $22 billion in short-term interbank claims into bonds with maturities of one to three years, which were fully guaranteed by

[81] In this situation, a standstill involved convincing banks outside Korea to roll over maturing lines of credit to Korean banks.
[82] Blustein (2001), Rubin and Weisberg (2003).
[83] Based on Robert Kahn's recollection of events from his experience as an IMF staffer who helped to develop the real-time monitoring system. See also Boughton (2012), pp. 564-565, and Blustein (2001).

the Korean government. The exchange normalized Korea's debt and allowed the country to return to the debt market in April 1998.

Although we leave aside examples from other regions, Asian efforts at regional cooperation have been highly visible and important; the crisis catalyzed a significant effort among Asian central banks to expand regional diplomacy. This impetus reflected a number of factors. Within Asia, there was a belief that a strong regional response was needed to avoid the sort of contagion that had been experienced during the Asian financial crisis and ensure that Asian countries "never again" would need to turn to the IMF for emergency support. The crisis had created a new appreciation that shocks affecting one country could spill over quickly to others in the region. Increased dependence on foreign capital and bank loans, as well as underdeveloped domestic financial markets, were seen as creating unique regional vulnerabilities from global swings in capital flows. At the same time, the strengthening of regionalism around the world, including the launch of the euro in 1999 and trade integration in the Americas, reinforced the acceptability of regional arrangements.

This pressure for regional solutions was reflected in a number of dimensions. In the fall of 1997, Japan's Vice Minister for International Finance, Eisuke Sakakibara, proposed the creation of an Asian Monetary Fund (AMF) with an initial $100 billion to provide trade finance and balance of payments support to the Asian economies.[84] This represented an attempt by Japan to take the lead in creating a new regional financial institution that would not, at least initially, include the United States. But the effort was poorly prepared and ran into strong opposition particularly from the United States, which was concerned that the new agency would undermine the influence of the IMF, and from Germany, which was concerned about the moral hazard created if financing to avoid balance of payments adjustment was too readily available.

Following the failure of this effort, subsequent regional coordination initiatives were more carefully designed to be complementary to, rather than competitive with, existing international bodies. At a November 18-19, 1997, meeting of Asian-Pacific finance ministry and central bank deputies,[85] agreement was reached on the "Manila Framework" that explicitly acknowledged the

[84] This occurred shortly after the "Friends of Thailand" meeting and with the group's support. See Kawai (2015).
[85] Fourteen countries attended, including from outside Asia the United States, Canada, Australia, and New Zealand.

central role of the IMF.[86] This was to serve as the basis for regional central bank cooperation following the crisis, including the establishment of regional liquidity support arrangements through the Chiang Mai Initiative (CMI), the formation of the Asian Bond Fund (ABF), and the progress toward creation of an Asian Bond Market Initiative (ABMI).[87] These initiatives were developed and moved forward primarily through regional financial forums, with a central role for ASEAN+3 and EMEAP.

The ASEAN+3 finance ministers endorsed the creation of the CMI at their May 2000 meeting, held on the margins of the ADB annual meeting in Chiang Mai, Thailand.[88] In addition to a commitment to strengthened policy dialogue and regional cooperation in general, the proposal envisaged an expanded ASEAN swap arrangement consisting of a network of bilateral swap and repurchase agreement facilities among ASEAN+3 countries; the exchange of "consistent and timely data and information on capital flows"; creation of a regional financing arrangement to supplement IMF and other official lending arrangements; and creation of an early warning system to identify sources of financial instability on a timely basis.[89] The CMI remains the most controversial of the Asian regional initiatives.

The initial swap lines were small,[90] and cognizant of the controversy over the Asian Monetary Fund, only 10 percent of the amount could be drawn without an IMF review.[91] This requirement limited the perceived value for addressing pure liquidity crises, but reflected the judgment that the CMI lacked the ability to perform independent and credible surveillance and monitoring. At the same time, an increase in the resources available to the IMF and new flexibility in its lending

[86] The Manila Framework proposed three areas for regional cooperation: (1) a regional surveillance mechanism; (2) technical cooperation to improve domestic regulations and financial systems; and (3) a financing mechanism called the Cooperative Financing Arrangement (CFA).

[87] See Jung (2008). The development of regional financial markets, which were seen as backward and inefficient and leading to dependence on funding from abroad, was the focus of EMEAP and ASEAN+3 initiatives. While there has been rapid growth in these markets in subsequent years, some have questioned how much credit should be given to these efforts.

[88] See Henning (2002), chapter 3, for details.

[89] Joint Ministerial Statement (2000).

[90] Henning (2002, p. 13) notes that, "With ASEAN and South Korea, the total reserves of the "10 plus 3" countries were $729 billion, which did not include Hong Kong or Taiwan's foreign exchange reserves, nor ASEAN+3's noncurrency reserves, such as gold, Special Drawing Rights (SDRs), and reserve positions in the IMF." Table 3.1 indicates that the size of each bilateral currency swap ranged from $1 to $3 billion.

[91] The amount that can be drawn without IMF review has now been increased to 30 percent.

rules[92] further reduced the need for the facility. In the end, the CMI has not been drawn upon but remains as a central element of the regional crisis response mechanism.[93]

In sum, the Asia crisis resulted in a number of innovations in the way that central banks communicated and coordinated. First, it brought to the surface growing pressures from emerging market countries to have a greater voice in policymaking, and as noted earlier, ultimately led to the creation of the G-20 grouping of finance ministers and central bank governors. The Korea program led to an unprecedented use of moral suasion by central banks in a coordinated effort to stem capital outflows. Furthermore, the CMI, while ultimately ineffective, was an early exercise in creating a swap network and remains a potential base for future central bank diplomacy in Asia. In each of these cases, the job of furthering regional cooperation fell primarily to the central banks, albeit with strong political support from their sovereigns.

The Global Financial Crisis

Much as has been written about the global financial crisis (GFC), yet the origins of and lessons to be drawn from the deepest crisis the global economy has seen since the Great Depression are still being debated. For the purposes of this paper, one point on which there is agreement is that the policy response required an extraordinary degree of central bank coordination, brought forth a comprehensive rewrite of the playbook for dealing with financial crises, and will have implications for how central banks operate (and relate to each other) for generations to come.

The onset of the GFC began in summer 2007, when a collapse in confidence by investors in the value of sub-prime mortgages led to a credit crunch and liquidity crisis in global capital markets.[94] As the crisis deepened and spread—reflecting the unwinding of a credit boom combined with excessive leverage, underpricing of risks, and insufficient risk management—central banks responded with increasing urgency, providing liquidity, slashing interest rates, and

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[92] In 2002, the IMF introduced “exceptional access” rules allowing lending in excess of normal lending limits subject to conditions.

[93] Since its creation in 2000, the CMI has been enlarged and converted into a multilateral facility: it was multilateralized—that is, converted into a reserve pooling arrangement known as the CMIM, with $120 billion in resources. In 2012, CMIM resources were increased to $240 billion and members are now permitted to draw up to 30 percent of quota without an IMF program.

[94] Many date the start of crisis from August 9, 2007, when interbank markets seized up following BNP Paribas’ announcement that it was suspending redemptions in three of its investment funds because of a collapse in the liquidity of subprime mortgage assets.

undertaking asset purchase programs in order to stabilize financial conditions, restore market functioning, and stimulate economic activity.[95] In this account, we separate the discussion into conventional monetary policy actions, actions related to market functioning and liquidity provision, and unconventional policies; we find the functional approach in this case to be more informative than the chronological narrative we used for outlining the two previous coordination episodes.

The onset of the GFC quickly led central banks to recognize that cooperation and coordination among central banks around the world was necessary and needed new impetus. In terms of policy, actions in early days included a conventional monetary policy response—a rapid reduction in interest rates by the major central banks as they sought to offset the shortfall in demand and tightening of financial conditions. While there is little doubt that there was extensive consultation and communication among central banks, the early response to the crisis is best described as diplomacy: Central banks exchanged information and analysis resulting in parallel—but not coordinated—cuts in policy interest rates in response to signs of simultaneous economic slowing.[96] Many central banks began cutting policy rates in August 2007,[97] which at the time was seen as unusual and preemptive given that growth was just beginning to falter and inflation in many countries was running above target.[98] The pace of rate cuts accelerated and continued through the end of 2008 as the crisis gathered momentum.

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[95] See Bernanke (2008), Duke (2012).

[96] See Committee on the Global Financial System (2008, p. 8): "The financial market turmoil prompted central banks to have much more frequent and detailed discussions about market developments and the technical aspects of their market operations, both bilaterally and collectively. Such enhanced cooperation took place both at the Governors level and at the experts' level. The Bank for International Settlements served as a forum in this respect. Communication across central banks intensified as the turbulent episode evolved over time." Bernanke (2008) also discusses this diplomacy.

[97] On August 17, 2007, the Federal Reserve cut the discount rate 50 basis points, narrowing the spread between the discount rate and the federal funds rate target; in September, the Fed announced a further cut of 50 basis points in both the discount rate and the fed funds target, bringing those rates to 5¼ percent and 4¾ percent, respectively. Prior to the collapse of Lehman Brothers in September 2008, the Fed cut the funds rate target six more times bringing the cumulative easing to 325 basis points; central banks in Canada, New Zealand, and the United Kingdom also reduced policy rates by 150, 75, and 75 basis points, respectively, over this period. In contrast, the ECB kept policy rates on hold after June 2007 and increased them by 25 basis points in July 2008 to counter rising inflation; the ECB began a sequence of rate cuts on October 8, 2008, when it reduced its rates on the deposit and marginal lending facilities by 50 basis points. See Chailloux et al. (2008) and Committee on the Global Financial System (2008) for additional details.

[98] For example, the start of the recession in the United States is dated as December 2007, by which point the Federal Reserve had already reduced its target for the federal funds rate by 100 basis points.

Central banks moved from the realm of diplomacy to coordination in October 2008 when, three weeks after the collapse of Lehman Brothers, six major central banks—the Bank of Canada, Bank of England, ECB, Federal Reserve, Sveriges Riksbank, and Swiss National Bank (SNB)—jointly announced a reduction in their policy rates of 50 basis points.[99] Such a coordinated monetary policy action is highly unusual. Amid a simultaneous economic slowdown, the coordinated action was meant to send a strong signal to global financial markets of policymakers' intent to mitigate the effects of the crisis. Similar language was used by the central banks in their announcements to reinforce the sense of shared purpose in the policy decisions.[100] At the same time, and encouraged by this move, central banks in major emerging market countries also cut policy interest rates, and many—notably China—took other measures to boost credit growth. These latter actions did not come as a total shock to financial markets, but the timing was a surprise and the cuts were not fully priced in.

In addition to reducing policy rates, the Federal Reserve and other central banks took measures to deal with liquidity shortages that were developing, providing funding first to banks and later to other financial institutions—actions consistent with their role as lenders of last resort. The first coordinated action of this sort took place in December 2007 when the central banks of Canada, the euro area, Switzerland, the United Kingdom, and the United States jointly announced measures intended to address elevated pressures in short-term funding markets.[101] In addition to efforts to address domestic liquidity shortages, other measures were needed to address dollar funding shortages arising from the foreign-currency exposure on the balance sheets of financial institutions outside the United States—exposure that had been rising with globalization. These

[99] The Bank of Japan expressed its support, and China informally joined in the easing, lowering reserve requirements by 50 basis points; benchmark lending and deposit rates also were reduced by 27 basis points.

[100] Notably, both the Federal Reserve and the ECB began their statements with, "Throughout the current financial crisis, central banks have engaged in continuous close consultation and have cooperated in unprecedented joint actions such as the provision of liquidity to reduce strains in financial markets." See Federal Reserve (2008a) and European Central Bank (2008).

[101] The Federal Reserve announced the establishment of its Term Auction Facility (TAF), which made dollar funding available to depository institutions operating in the United States, and of temporary currency swap lines with the ECB and SNB; the ECB announced actions to provide dollar liquidity to Eurosystem counterparties in connection with the TAF. See ECB (2007) and Federal Reserve (2007). In 2008, the Federal Reserve established a number of other facilities to provide liquidity to key financial market actors and markets—two examples are the Money Market Investor Funding Facility and the Commercial Paper Funding Facility (http://www.federalreserve.gov/monetarypolicy/bst_archive.htm). The communiqué from the November 2007 meeting of G-20 ministers and governors had acknowledged that "an orderly unwinding of global imbalances, while sustaining global growth, is a shared responsibility."

dollar funding shortages added concerns about currency mismatches on the balance sheets of major financial institutions and led to "a more internationally coordinated approach among central banks to the lender-of-last-resort function."[102]

The dollar funding strains led to a significant step forward in central bank coordination with the creation of a network of bilateral currency swap arrangements.[103] Led by the Federal Reserve, the arrangements began with two major central banks in December 2007 (the ECB and SNB), and by the end of October 2008 had been expanded to encompass 12 more.[104] As Duke (2012) details, "Under these swap arrangements, in exchange for their own currencies, foreign central banks obtained dollars from the Federal Reserve to lend to financial institutions in their jurisdictions. These swap arrangements pose essentially no risk to the Federal Reserve: They are unwound (with a fee paid by the central bank drawing on the swap arrangement to the Federal Reserve) at the exact same exchange rate that applied to the original transaction, they are conducted with major central banks with track records of prudent decision-making, and they are secured by the foreign currency provided by those central banks."[105] The swap lines were renewed on several occasions, becoming a core element of central bank liquidity support. In December 2008, usage of the Fed's swaps by foreign central banks peaked at nearly $600 billion.[106]

The success of the swap lines in mitigating funding pressures and reducing interbank borrowing rates is considered one of the major successes from central bank coordination during the crisis.

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[102] Bernanke (2008), p. 3.

[103] See Fleming and Klagge (2010) and Bordo, Humpage, and Schwartz (2015), pp. 352-356, for a detailed descriptions of these swap arrangements. The establishment of such swap arrangements was not unprecedented—the Federal Reserve had set up similar arrangements after the terrorist attacks on September 11, 2001.

[104] These were the central banks in Australia, Brazil, Canada, Denmark, Japan, Mexico, New Zealand, Norway, Singapore, South Korea, Sweden, and the United Kingdom. In addition, in fall 2008, the ECB established a euro swap arrangement with the Danish central bank and euro repurchase agreements with central banks in Hungary and Poland; the SNB established Swiss franc swap arrangements with the ECB and National Bank of Poland. For details on these liquidity arrangements, see Ho and Michaud (2008).

[105] Duke (2012), pp. 3-4. Caruana (2012, p. 3) notes that "The extension of such swaps in unlimited amounts represents a turn in central bank cooperation that the founders of the BIS would have found unimaginable." Bernanke (2015a) reflects on the political sensitivities of instituting the swap arrangements (p. 163), noting that "The ECB, in particular, was sensitive to any aspects of a currency swap arrangement that might imply that the Fed was riding to the rescue of European markets. We, in turn, wanted to avoid an incorrect inference that we were lending to potentially risky foreign private banks rather than creditworthy central banks." Broz (2014) discusses the Federal Reserve's choice of swap counterparty countries and the congressional response to the arrangements.

[106] Mersch (2010); see Chart 4 in Fleming and Klagge (2010).

In addition to easing funding shortages, these swaps also contributed to an alleviation of market fears and sent a strong signal that central banks were prepared to move outside of their comfort zone to address financial stress. In this regard, it is worth noting that three emerging market central banks participated in these arrangements (Brazil, Korea, and Singapore). Notably, Korea drew on its swap line with the Federal Reserve but not on its CMI swap line. It is generally believed that the existence of the lines helped prevent stresses that could have otherwise developed.[107] As the financial crisis receded, the swap lines were allowed to expire in February 2010. However, in May 2010, in response to "the reemergence of strains in U.S. dollar short-term funding markets in Europe,"[108] the Federal Reserve announced that it had reopened temporary swap lines with the Bank of Canada, the Bank of England, the Bank of Japan, the ECB, and the SNB; in November 2011, these same central banks announced enhancements to the swap arrangements.

By the time financial markets had begun to stabilize, interest rates in much of the advanced world were at or quite near zero (at the time, zero was considered the lower bound on policy rates[109]). Central banks then began to turn to unconventional monetary policies—large scale asset purchases and forward guidance about expected future policy rates—in order to provide additional easing in broader financial conditions. The first asset purchase program during the GFC, announced by the Federal Reserve in November 2008, was motivated by the desire to provide direct support to the housing sector.[110] While central banks have established a number of subsequent programs targeted to specific sectors of the economy, most programs have involved purchases of government securities with the more general objective of easing monetary conditions and restoring monetary transmission to stimulate economic recovery and expansion.[111] In some countries, asset purchase programs were combined with strong

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[107] See Duke (2012).

[108] Federal Reserve (2010a), "FOMC statement: Federal Reserve, European Central Bank, Bank of Canada, Bank of England, and Swiss National Bank announce reestablishment of temporary U.S. dollar liquidity swap facilities," May 9; Federal Reserve (2010b), "FOMC statement: FOMC authorizes re-establishment of temporary U.S. dollar liquidity swap arrangement with the Bank of Japan," May 10.

[109] Beginning in 2012, several central banks (in Denmark, the euro area, Japan, Sweden, and Switzerland) have begun to experiment with negative policy rates.

[110] In announcing the program, the Fed said: "This action is being taken to reduce the cost and increase the availability of credit for the purchase of houses, which in turn should support housing markets and foster improved conditions in financial markets more generally." See Federal Reserve (2008b).

[111] See Habermeier and Mancini Griffoli (2013) and IMF (2013a, 2013b) for discussion of these programs and their effects.

communication about the expected path of policy interest rates (known as forward guidance).[112] Although central banks have not directly coordinated these unconventional policy actions, they have continued to rely on diplomacy to inform and discuss these actions in international forums.

Throughout the exploration and expansion of unconventional policies, there was extensive press coverage of central bank diplomacy, including central bank meetings, and reporting that highlighted the close communication among central bank governors and senior staff, and the efforts at the BIS and elsewhere to draw common lessons for the conduct of monetary policy (for example, on issues such as lending against collateral and the use of forward guidance). Newspaper articles highlighted the shared backgrounds and academic training of many central bank heads.[113]

Extensive asset purchase programs did cause strains among central banks, particularly in the emerging markets. The most outspoken critic of the effects of unconventional monetary policies, both during the implementation of the asset purchase programs and as the time to end them neared, was Bank of India governor Raghuram Rajan, who captured the concern of many emerging market governments that central banks in advanced economies were not taking adequate account of the extra-national effects of their policies.[114]

Although financial supervision and regulation are dealt with elsewhere in this volume, it is important to note here that there were extensive efforts during this period—including at the BIS, the FSB, and the Financial Action Task Force—to coordinate on central bank rescues of financial institutions and the creation of a new architecture that, among other things, would improve the provisions for orderly liquidation of banks.

As we noted earlier, the G-20 forum for finance ministers and central bank governors garnered a greater role in policymaking beginning in the fall of 2007 as signs of what was to become the global financial crisis began to emerge. Paul Martin had lobbied for the original creation of the G-20 in the late 1990s when he was Minister of Finance in Canada, and had been a long-time advocate of raising the group to the leaders' level and giving it a prominent role in crisis governance. There was debate over whether some new grouping could be created, but the

[112] Canada and the United States are notable examples.
[113] For example, see Hilsenrath (2012), Hilsenrath and Blackstone (2012).
[114] Rajan (2013).

politics of deciding who was in and who was out soon proved intractable. Further, the G-20, with its established "troika structure,"[115] provided the needed infrastructure for bringing together leaders of the major countries quickly, at a time of crisis. Consequently, following a request from French President Nicolas Sarkozy and British Prime Minister Gordon Brown to U.S. President George W. Bush, the G-20 met for the first time at the leaders' level in Washington in November 2008.[116] While concerns were expressed at the time that the summit could fail to deliver on heightened expectations, it was subsequently seen as successful in establishing an agenda for dealing with the GFC and assumed a central role in the policy response that unfolded over the course of several summit meetings. And, in spring 2009, the leaders established the Financial Stability Board (the successor institution to the FSF) tasked with promoting reform of international financial regulation and whose membership included all G-20 members.[117]

IV. Looking Ahead

"In this complex and interdependent world there is, and will continue to be, a clear need for structured, institutionalised central bank cooperation… [To] be effective and legitimate, such cooperation must continuously evolve and adapt to an evolving international monetary and financial environment, with financial and economic crises serving as catalysts for change. Put differently, the evolution of central bank cooperation is inherently linked to the challenges presented by the evolution of the international monetary and financial environment, changes in institutional frameworks and advances in economic thought." (Jaime Caruana)

The case studies presented in this paper—the Plaza Accord, the Asian financial crisis, and the Global Financial Crisis—demonstrate clearly that while central bank thinking evolves and adapts over time to changing global circumstances, financial and economic crises serve as, in Caruana's words, "as catalysts for change." Repeatedly during the post-war period, crises have led to

[115] Leadership of the G-20 rotates among countries, and the staff from the prior-, current-, and next-year host countries form a secretariat that prepares for the ministerial meetings.
[116] Some credit that first G-20 leaders' summit as the impetus behind the coordinated interest rate cuts. Angeloni and Pisani-Ferry (2012, pp. 15-16) write that the communiqué conveyed "a sense of urgency, focus, and concreteness that could not be found in the traditional G7/G8 declarations. Instead of broad, often nebulous, open-ended political declarations encompassing a wide range of topics, it reads like what it is—an extremely focused action plan… the language is precise, even technical—specialised institutions in charge of carrying out work… are named and they are given strict deadlines for implementation."
[117] Langdon and Promisel (2013) discuss the transition from the FSF to the Financial Stability Board.

changes in how central banks communicate and act, changes that can have long lasting effects on the global financial architecture.

There are a number of reasons that this is likely to remain the case. First, at a time of crisis, there often is a compelling reason that the appropriate central bank policies are significantly different from what policymakers would choose if they were acting independently, due to perceived gains from policy coordination.[118] Second, when a crisis does hit, central banks need to move fast to stay ahead of rapidly developing events in financial markets.[119] Further, statutory independence often affords central banks the capacity to move ahead of their governments. Maintaining a balance between moving quickly and being accountable to the public requires that central banks both have appropriate powers and instruments, and be able to explain their actions to the public.

Getting that balance right has, if anything, become more challenging in recent years. As noted earlier, central banks were drawn into a wider range of activities during and in the aftermath of the GFC, some of which had a quasi-fiscal character or involved unconventional policies that were introduced when policy interest rates neared zero. As a consequence, central banks have arguably acquired a wider range of powers in the areas of unconventional monetary policy, crisis response, and financial stability. These wider powers have challenged conventional wisdom about how central banks should operate and, in some countries, resulted in political backlash.[120]

While it is a fool's errand to try and predict the next crisis, there is accumulating evidence that we are now more interconnected, that financial channels transmit shocks across national borders more widely and with more power than in the past, and that as a consequence the spillovers from shocks abroad will become even more consequential.[121] This has implications for financial

[118] See Obstfeld and Rogoff (2002) for the argument that when credible central banks are following optimal policies, the gains from policy coordination are small, and Taylor (2013) for why unconventional monetary policies arising from the GFC have created the potential for additional coordination gains.
[119] A good example is the response to the 2016 British referendum—Brexit—that produced a majority vote in favor of exiting the European Union. Following the vote on June 23, central banks moved quickly and in a clearly coordinated fashion. Bank of England Governor Mark Carney signaled to financial markets the Bank's willingness to "take all necessary steps to meet its responsibilities for monetary and financial stability" and hinted at possible future monetary easing (see www.bankofengland.co.uk/publications/Pages/calendar/default.aspx). The SNB and a number of emerging market central banks reportedly intervened in foreign exchange markets. Other leading central banks including the Bank of Japan, ECB, and Federal Reserve signaled that they were closely monitoring developments in global financial markets and were prepared to address liquidity needs.
[120] See Balls et al. (2016) for a comprehensive review.
[121] For example, a recent IMF (2016, chapter 2) report finds, unsurprisingly, that trade and financial integration of emerging market economies into the global economy and financial system has increased significantly over the past

regulation, which is dealt with elsewhere in this volume. But it also has important implications for monetary policy at the leading central banks and suggests a potentially more significant role for central bank diplomacy in the years to come.

two decades, and that the financial spillovers to industrial countries from shocks in emerging market (particularly China) are more substantial and complex than previously understood.

Figure 1. Trade-weighted U.S. Dollar Index

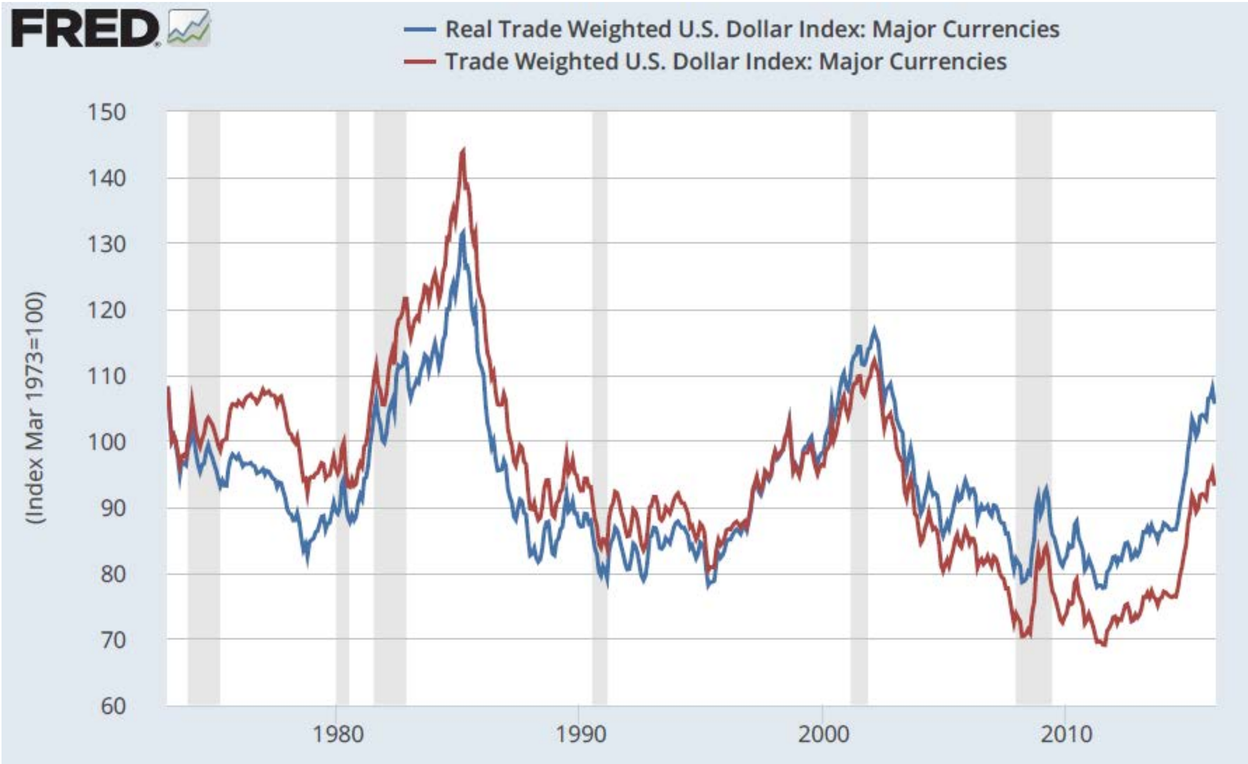


Figure 2. The Twin Deficits

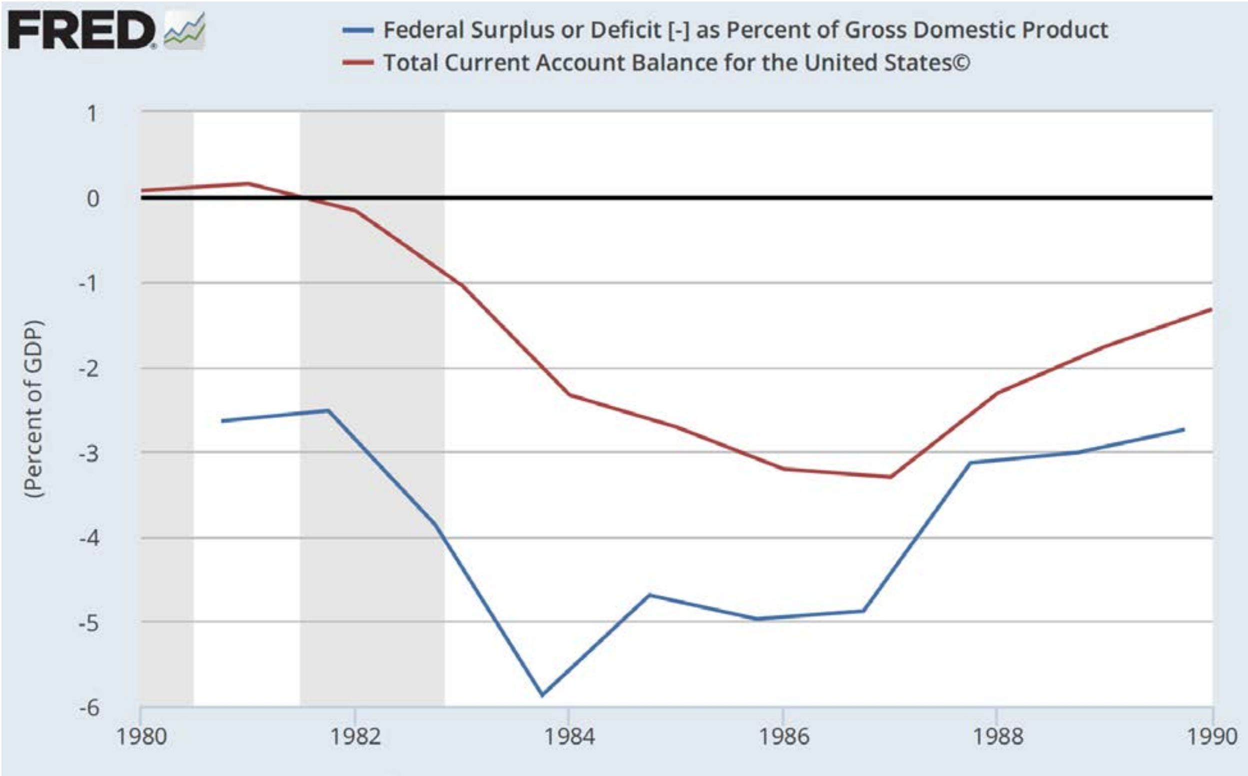
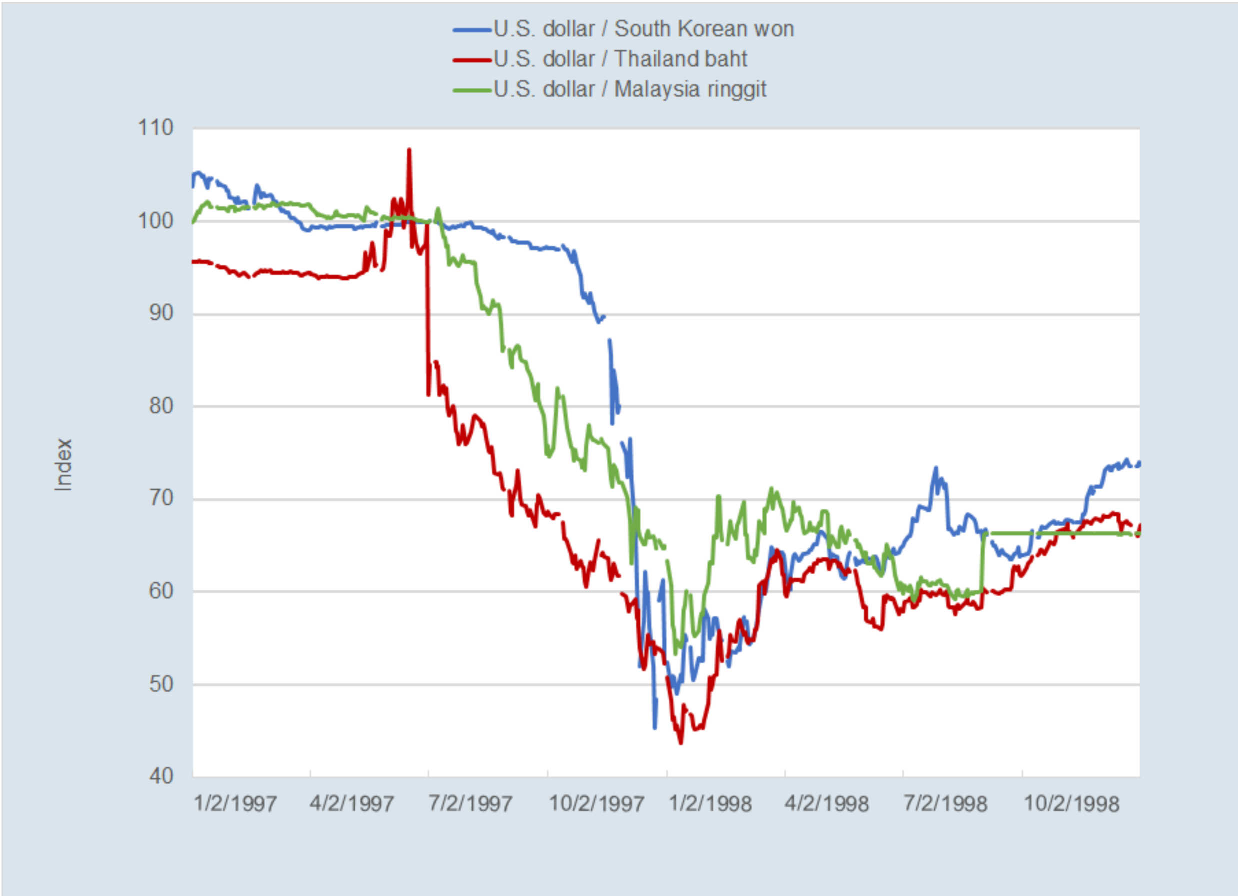


Figure 3. Asian Financial Crisis, Selected Exchange Rates (index=100 on July 1, 1997)



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