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1. Introduction[1]

An international monetary regime can be defined as a set of rules and arrangements underpinned by expectations that provide two global public goods: international currencies and external stability (Bordo and Schwartz 1999, Dorrucci and McKay 2011). Its main function is to facilitate economic and financial integration between the nations that are part of the international monetary regime. Eichengreen (1996, p. 1) describes it as "the glue that binds national economies together." This paper deals with how this glue has bound national economies together throughout the last 200 years. Specifically, we focus on the role of central banks in shaping the broad trends from the commodity standards of the 19th century to the present mixed regime of floating and managed exchange rates. This story is not easy to capture, partly because the law usually left no formal role for central banks in the determination of exchange rate regimes. They were charged with maintaining internal price stability, issuing currency and promoting well functioning financial and money markets, but the choice of regime itself tended to be statutory and political, leaving the delivery of the exchange rate system as an adjunct to central banks' responsibility for domestic price stability. Therefore, officially, there was no major turning point in the history of the international monetary regime in which a central bank formally made a crucial difference. For example Britain's return to the gold standard in 1819 was decided by the Parliament, and it was the government that suspended the gold standard in 1914. After the war, again the government decided to bring sterling back to the pre-war parity in 1925 and suspended the gold standard again in 1931. France's decision to limit silver coinage in the 1860s was taken

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by the government, not the central bank. As in Britain, the suspension of the gold standard in 1914, the resumption of convertibility in the 1920s and the devaluation in the 1930s were all government affairs. In Germany, the decision to adopt the gold standard after the Franco-Prussian War was taken before the Reichsbank was even founded. After 1949 the Bundesbank retained a powerful stance in restraining domestic inflation, but the Snake, the European Monetary System and the Euro were the result of decisions taken by the government, in some cases against the advice of the Bundesbank. In the United States, the Federal Reserve was irrelevant when in April 1933 President Roosevelt decided to devalue the dollar. Subsequently, the main architect of the Bretton Woods system was Harry Dexter White of the Treasury, not Fed Chairman Marriner S. Eccles, and the accord was made legally effective by Congress. The timing of the end of the gold convertibility in August 1971 appears to have been mainly determined by President Nixon and his hawkish Treasury Secretary John Connally. This insight emphasizes the distinction between strategic and operational responsibilities under the different forms of international monetary system. While the strategic choice of regime may have rested with the government, the operational details and implementation of that decision was usually delegated to central bankers. This enhanced their *informal* influence even where the formal legal position may have suggested that they were mere functionaries in the system.

The subordinate role in choosing the exchange rate regime does not imply that central banks were irrelevant throughout the history of international monetary regimes. The way they managed the regime proved essential for international financial and monetary stability. Central bankers shared particular characteristics that made them the guardians of expertise about monetary matters. First, they often had the closest relationships with the constituents of the foreign exchange market in the form of banks and other financial institutions because of their roles as discounters and supervisors. Moreover, in most countries they were not subject to the political cycles of democratic regimes and so spanned government tenures in a way that lifted them above immediate political pressures. Being unaccountable directly to parliaments or voters also created opportunities for personal and private cooperation and communication, which facilitated their actions compared to democratically accountable politicians. In times of crisis, central bankers were frequently able to meet quickly and resolve obstacles expeditiously in ways that political actors were not able to achieve. The historical record also

reveals frequent episodes of conflict between central banks and governments over the priority of price stability over growth with attendant implications for the exchange rate regime.

As it is nearly impossible to capture all sides of the complex interaction between central banks and the international monetary regime, we focus on a question that appears to be particularly relevant in the wake of the recent financial crisis. We ask under what historical circumstances central banks have been successful in preserving the two main elements of an international monetary regime – international currencies and external stability – over the last 200 years. Our focus is on the history of the leading central banks in the Western Hemisphere since the end of the Napoleonic Wars and of the Bank of Japan since 1973. The choice is selective, but can be justified by the fact that these central banks were more crucial for the international regime and became models for the non-Western world, starting in the 19th century.

The most obvious answer to our question is that much depends on the personalities who lead the central banks. A famous example is the history of the Federal Reserve in the interwar years. Benjamin Strong has been said to be an able man who died too early, while Eugene Meyer did not have the grandeur to deal with the extraordinary crisis of the early 1930s (Friedman and Schwartz 1963). We take a different approach. Our main insight is that legal constraints on their powers pushed central bankers into a rather weak position so that they have had little effective influence on the crucial factors that have determined their success in managing the international monetary system during most of the past 200 years. This is not to say that personalities have not mattered at all or that no policy mistakes were made. But as a rule, central bankers acted within their mandate and in accordance with a broad consensus when making decisions. Episodes of failure are rather mistakes than a clear sign of incompetence.

The first factor that determined the influence of central banks is the type of exchange rate regime. Under a fixed exchange rate regime, central banks have fewer tools and a narrower range of operations than under a floating regime. This is particularly relevant in the event of severe financial crises. The second factor is central bank independence, which determines to what extent central banks have to be subservient to short-term domestic political interests. The more independent they are, the higher the probability that they can give priority to the international monetary regime, thus stabilizing expectations. The third factor is the degree of

economic policy divergence among the core countries. Capital controls may give central banks more time to cushion international tensions, but they do not solve underlying imbalances. The same is true for central bank cooperation. It can be useful to overcome temporary disturbances, but is to no avail if national agendas contradict the requirements of international stability.

We also observe that under a fixed exchange rate regime international economic policy divergence is by far the most important factor determining central bank performance. Regardless of the degree of their independence, central bankers fail in their attempts to preserve international monetary stability or, still worse, reinforce the collapse of the system by their actions, when core countries pursue divergent economic policies. Under a floating exchange rate regime, by contrast, central bank independence seems to be the crucial variable. Equipped with full instrument independence, central banks have the power to stabilize the international monetary system even when national economic policies diverge. Table 1 shows our argument about the role of central banks in a stylized form. The interwar gold standard and the Bretton Woods system were not sustainable, because the leading economic powers pursued divergent economic policies, and the floating exchange rate regime from 1973 to 1979 was unstable because of the lack of central bank independence to cope with the exogenous shocks of this era. By contrast, the classical gold standard and the floating exchange rate regime from 1979 to the present can be considered stable regimes, either because there was an international consensus (classical gold standard) or because central banks were independent (1979 to the present).

Table 1: Comparison of international monetary regimes

	Central bank independence	**Economic policy convergence**
Fixed exchange rate regimes		
Classical gold standard	+	+
Interwar gold standard	+	–
Bretton Woods system	–	–
Floating exchange rate regimes		
Floating exchange rate system 1973-79	–	–
Floating exchange rate system 1979 to the present	+	–

In the following sections, we will put more flesh on the bones of our argument. Section 2 describes the era of the classic gold standard, which was the first international monetary regime where central banks played an important role. Until this time, "the banks of note issue" had been secondary, since the system of "international bimetallism" (Flandreau 2004) was decentralized and based on privately owned and transacted bullion. The classic gold standard was a stable regime because it combined central bank independence and economic policy convergence. To be sure, there were attacks on the gold standard and rudiments of divergence, especially in the US, but they never became strong enough to destroy the political and institutional foundations of the international monetary system.

The next two sections deal with the interwar gold standard and the Bretton Woods system. Both systems proved inconsistent as the economic policies of the great powers diverged. The

degree of central bank independence varied throughout the period. It was quite high between the end of the First World War and the beginning of the Great Depression, while after 1945 central banks were almost everywhere subordinated to the ministry of finance or the treasury. Possibly, the Fed could have done a better job in the 1930s when large parts of the banking system were collapsing, or it would have contained inflation in the 1960s, had it been more independent. Yet, as we will argue, the systemic flaws were too fundamental to be papered over by a different monetary policy. Central bank cooperation was reinforced, but proved inadequate in the wake of growing international imbalances.

Section 5 analyses the experiences since 1973, which have been mixed. In the first period, lasting from 1973 to 1979 the system was unstable. Governments had abandoned fixed exchange rates without embracing the advantages of the floating exchange rates and giving central banks the mandate to curb inflation. The regime was also inconsistent as states wavered between ameliorating unemployment and containing inflationary expectations. Things changed after 1979 when the Fed, the British government and the members of the newly founded European Monetary System increased their determination to restrain inflation. The era of the Great Moderation promoted the reputation of independent central banks in achieving relatively full employment, sustained economic growth with price stability. In the wake of the financial crisis of 2007-2009 the record looks less impressive than before 2007. However, we will argue that even from today's perspective the glass is half full, not half empty. The chapter ends with a short conclusion.

2. Central banking under the classical gold standard

Between the end of the Napoleonic Wars (1815) and the outbreak of the First World War (1914) most Western countries had a fixed exchange rate regime based on a gold, silver or bimetallic standard. Economic historians distinguish between two eras. The first era, lasting from 1815 to 1873, was characterized by so-called international bimetallism, whereas the years between 1873 and 1914 were dominated by the classic gold standard. During the gold standard era, silver standards continued to exist only in China, India and some Central American economies, while the bimetallic standard remained only a de jure regime but was de facto abandoned.

The time between 1815 and 1914 was also the period when most industrialized countries set up a “banks of issue” (Table 2). The forerunners had been the Swedish Riksbank (1668), the Bank of England (1694) and the Banque de France (1800). An important milestone was the establishment of the Prussian Bank in 1847, which in 1876 was transformed into the Reichsbank to unify the German currency and deliver the rules of the gold standard in the German Empire. The State Bank of the Russian Empire was founded in 1860. The Bank of Japan, the first central bank outside Europe, opened in 1882, but had a rival in the Yokohama Specie Bank, which managed metallic reserves and international transactions. Japan only joined the gold standard in 1897 after a war indemnity in gold was won from the Chinese government. The USA lacked a central bank until 1913, which impeded the coherence of national monetary policy. The USA formally joined the gold standard in 1900, finally giving up the fight for silver based on the silver mines of Nevada.

Table 2: The Origins of Central Banks*

Year	Country	Name	Motivation
1668	Sweden	Sveriges Riksbank	Finance war
1694	UK	Bank of England	Finance war
1782	Spain	Banco de España	Finance war
1800	France	Banque de France	Manage public debt, generate seignorage
1811	Finland	Suomen Pankk	Monetary sovereignty
1814	Netherlands	Nederlandsche Bank	Promote economic growth
1816	Austria	Österreichische Nationalbank	Manage public debt as a

			result of war finance
1816	Norway	Norges Bank	Economic crisis in Denmark prompts monetary reform
1818	Denmark	Danmarks Nationalbank	Restore stability in aftermath of war finance
1846	Portugal	Banco de Portugal	Restore credibility to previous monetary regime
1847	Prussia	Bank of Prussia	
1850	Belgium	Banque nationale de Belgique/Nationale Bank van België	Reform prompted by banking crises
1860	Russia	State Bank of the Russian Empire	
1876	Germany	Reichsbank	Consolidation of previous note issuing authorities following unification
1882	Japan	Bank of Japan	Part of modernization of Meiji regime
1893	Italy	Banca d'Italia	Consolidation of previous note issuing authorities following unification
1907	Switzerland	Schweizerische Nationalbank/Banque nationale suisse	Elimination of note issuing authority
1911	Australia	Commonwealth Bank of	Creation of a single note

		Australia	issuing authority
1913	USA	Federal Reserve System	Creation of lender of last resort and other banking related functions

Sources: Goodhart, Capie and Schnadt (1994), Siklos (2002).

Note: * The list is confined to central banks of today's OECD countries. There were also new central banking institutions on the Netherlands Antilles (established 1828), in Indonesia (1828), Bulgaria (1879), Romania (1880) and Serbia (1883).

Central banks did not play a vital role prior to the advent of the classical gold standard. A short digression into the inner workings of the international regime before 1873 is needed in order to understand why. The regime consisted of three different groups. Britain, the heartland of the industrial revolution and the rising center of the world economy, was the head of the gold group, in association with its dominions and colonies. Outside of the British Empire only Brazil, Portugal and Turkey were also on the gold standard by the mid-19th century. It is important to note that prior to the classical gold standard the pound sterling and the London market were not yet as predominant as they would be after the 1870s (Ugolini 2010). The silver group was bigger, but had no strong financial center or lead central bank. It comprised Austria, Prussia and the other German states, the Netherlands and the Scandinavian countries. Outside of Europe, Asia was firmly on silver (China, India and Japan) while in the Americas only Mexico opted for this standard. The strong position of silver in Asia was a result of the sustained drain of American and European silver to the developed industrial centers in the Far East since the 16th century. The third group was on a bimetallic standard, with France at its center and Belgium, Italy, and Switzerland as its associates. In the mid-1860s, the group formalised rules concerning the silver content of the 5-franc coin by constituting the Latin Monetary Union. In 1868, Greece and Spain joined. The United States was also on a bimetallic standard from 1792 to 1862, when in the course of the Civil War the dollar began to float. Contrary to the textbook predictions that bimetallism breeds instability, the early 19th century bimetallic standard proved robust and durable, partly through the management of central banks (Friedman 1990, Velde 2000, Flandreau 2002).

Although there were three distinct groupings, it is appropriate to speak of one regime, because it succeeded in providing the two essential public goods of any international monetary system: international currencies and external stability. From 1803, the bimetallic group legally stabilized the price ratio between gold and silver (1:15.5). It did so by absorbing the metal that was in oversupply, while releasing the other metal that was scarce. In this careful balancing act, the Banque de France succeeded very well and the ratio between gold and silver remained very stable from 1803 to the early 1870s when the system of international bimetallism collapsed (Friedman 1990, Flandreau 2004). In particular, the system was elastic enough to absorb the monetary supply shocks following the discovery of gold in Australia and California in the late 1840s and the discovery of Silver in Nevada in the late 1850s. But central banks were not essential for the operation of international bimetallism because a large part of the bullion stock was in private hands and payments in gold and silver were still very common, even across borders to offset payment imbalances between trading firms, banks and investors. In 1860, the Banque de France held only 14 percent of total specie supplies in France which made up more than three quarters of the money supply M1 (Flandreau 2004, p. 4).

Although they were not supporting pillars of the international monetary regime, central banks underwent an important transformation prior to 1873. Probably the most important innovation was their new role as lenders of last resort. In the first half of the 19th century even the most experienced institution at the time, the Bank of England, still made serious mistakes by rationing credit during the panic, thus magnifying negative effects. In the 1850s and 1860s, however, the Bank of England, the Banque de France and other central banks such as Norges Bank began to understand better how to deal with financial panics (Calomiris 2011, Bignon et al. 2012, Eitrheim et al. 2016). Bagehot's 1873 *Lombard Street* provoked considerable debate across Europe about the role of lender of last resort and the terms and conditions under which central banks could lend to financial institutions. Another important development before 1873 was the British discussion about rules vs. discretion under a metallic standard. Important milestones were the bullionist debates following the suspension of convertibility in 1797, the controversy between the banking and the currency schools after the restoration of the gold standard in 1821, the Bank of Act of 1833 that made Bank of England notes legal tender, and the Bank Act of 1844 which gave the Bank of England the monopoly of note issue.

The co-existence of different metallic standards came to an end in the early 1870s. The crucial event was the Franco-Prussian War of 1870/71. With fresh gold reserves from its war indemnity from France, the newly founded German Empire decided to abandon the silver standard in favor of the gold standard. In retaliation for German unilateralism, France reacted by suspending its role as moderator of the international bimetallic regime. As a result, the price of silver relative to gold began to decline, prompting the European silver group to adopt the gold standard. France and the United States, driven by the advantages of network effects, soon followed (Gallarotti 1995, Flandreau 1996, Meissner 2005). By the late 1870s the transition to a mono-metallic gold standard was completed, leaving relatively few low income economies such as Mexico, India and China retained the silver standard. A new era had begun and central banks became important in the management of the international monetary regime.

First and foremost, central banks managed a much larger share of gold than before 1873, and they acted as the institution that took responsibility for maintaining convertibility between gold and notes. The shift to the gold standard thus brought a nationalization and centralization of the international monetary regime and, based on their monopoly, central banks became ever more skilful in expanding their room to maneuver. Seen from today, however, they were not yet conducting a modern monetary policy.[2] They also differed with respect to their mandates and instruments. The Bank of England was an exception rather than the rule in terms of its statutory independence and range of responsibilities. One essential difference was the importance of the banking business. While the Bank of England had only a few branches outside London and faced strong competition by private banks in London, the Banque de France and the Reichsbank had a dense web of subsidiaries that provided a substantial share of normal banking services. Another difference was the variation in gold and silver reserves. The Banque de France possessed a huge share of global gold reserves, providing a strong shield against external shocks and widening their room to maneuver, whereas the Bank of England had a rather small gold cushion. The Bank of England also used the discount rate as

[2] Sayers (1976, p. 1) observes: "The term 'central bank' had been creeping into public discussion in the second half of the nineteenth century but had not yet any settled concept behind it. (…). At the end of the nineteenth century, however, 'central bank' meant scarcely more than a single bank distinguished from others by unique public responsibilities eclipsing its commercial interests."

the main policy instrument, while the Banque de France did not (Contamin 2003, Morys 2013).

All in all, the core central banks succeeded in preserving stability, mainly because of the high degree of credibility of the monetary regime. Private-sector agents expected that central banks would always keep their commitment to safeguarding convertibility, except in well justified exceptional circumstances. This set in motion a virtuous circle between strong credibility and monetary autonomy in the short-run which helped run the system like a target zone (Bordo and Flandreau 2003, Bordo and MacDonald 2012). When the exchange rate fell toward the lower limit (gold point), central banks were not immediately forced to raise interest rates; investors drove the exchange rate back to par, expecting that the central bank would ultimately react. In anticipating a tightening of monetary policy, short-term capital movements replaced the reaction and allowed 'automatic' stabilisation or at least gave the central bank some breathing space. Of course, the principle of convertibility acted as a constraint. Nevertheless, the notion that monetary policy was purely on autopilot has no historical foundation.

There were several opportunities for central bankers to enlarge their active management of the system. In good times, they increased the level of metallic and foreign exchange reserves well above the legal minimum in order to pursue an accommodative stance in times of crisis. They also used their holdings of bonds and bills to sterilize capital inflows (Øksendal 2012, Ögren 2012, Ugolini 2012). Another way to dampen the shocks to the financial and monetary system was to deploy so-called 'gold devices' such as delaying capital movements or to demand a fee to introduce further frictions into capital flows. Some central banks, especially the Austro-Hungarian bank, became quite skillful in using foreign exchange intervention to avoid interest rate spikes emanating from the Bank of England (Flandreau and Komlos, Jobst). The Bank of Belgium, the pioneer of foreign exchange management in the 1850s, also used this policy (Ugolini 2012) and it was an inspiration for the Bank of Japan. Finally, many peripheral countries never introduced specie convertibility (Morys 2013).[3]

[3] Morys (2013, p. 221): „If peripheral countries modified the "English" gold standard to suit their needs, this probably entails a wider lesson for the functioning of the Classical Gold Standard. There was not only one gold standard but a variety of gold standards. Peripheral countries apparently followed a version different from the

The classic gold standard enjoyed such a high degree of credibility partly because it was shielded from domestic politics and partly because the core countries pursued similar economic policy goals. Among the core countries the level of public debt was manageable, the public spending ratio to GDP was below 20 percent, and wages and prices were relatively flexible. Furthermore, the costs of adjustment were passed on to those parts of society that had the least political rights (Eichengreen 1996). In the 19th century suffrage was quite limited in most Western countries and governments in Europe were mainly concerned with internal and external security and property rights. A consensus that the state was responsible for the economic welfare of populations had begun to develop, but was not well established until the end of the century. This left most monetary authorities relatively free to pursue deflationary policies in order to maintain a metallic standard. The combination of exchange rate stability and free capital movements was the chosen combination, at the expense of a fully independent monetary policy.

The second factor promoting creditability was the relatively underdeveloped state of economic theory. True, early versions of price level targeting were developed in the beginning of the 19th century, and towards the end of the 19th century several economists, notably Knut Wicksell and Irving Fisher, devised well developed frameworks that explained the relationship between monetary policy and the business cycle (Laidler 1999, Burdekin et al. 2012). They showed that the gold standard was not the best framework for monetary policy. But these ideas remained marginal before 1914. Accordingly, the public and voters were not aware of the power central banks were exerting over the business cycle. Monetary policy was not yet politicized.

Thirdly, there were fewer massive exogenous shocks during the pre-1914 decades. Revolutions and wars as well as financial panics were frequent and serious, but not comparable to the First World War, the Bolshevik Revolution or the Great Depression. The

one pioneered by England. Perhaps it is precisely this institutional flexibility which explains why the Classical Gold Standard remains to this day the longest-ever system of fixed exchange-rates."

most serious European war between 1815 and 1914 was the Franco-Prussian war of 1870/71.[4] It lasted less than one year (from July 1870, to May 1871), with Germany and France counting 45,000 and 139,000 dead and 90,000 and 143,000 wounded soldiers respectively. In comparison, during the First World War more than nine million soldiers died and about 7 million civilians lost their lives. The revolutions of 1848 shattered existing social orders, but did not undermine property rights in the long run. In contrast, the Bolshevik Revolution of 1917 eradicated the noble and bourgeois elites in Russia, socialized all means of production and defaulted on all external debts. The Great Depression of 1929-33 paralyzed the two largest economies of the world, the USA and Germany, for more than three years, with real GPD declining by a third and unemployment rising to more than 20 percent. The only crisis of the 19th century that came near the catastrophe of the 1930s was the panic of 1837 in the USA. And as Calomiris (2011, p. 106) argues, financial panics after 1850 were harmless relative to the crises in the late 20th and early 21st centuries, because banks maintained high equity-to-assets and liquidity ratios.

A fourth explanation explaining the persistence of the gold standard highlights the importance of international emergency measures. Central banks repeatedly shipped gold or silver across frontiers to help contain a financial panic, especially in 1890 and 1907. The 1890 sovereign debt crisis focused in Latin America nearly brought down the great London finance house of Barings (Mitchener et al., 2008, Flores 2011) and threatened to push Britain off the gold standard. Argentina issued bonds payable in gold or in sterling in London, but was not itself on a metallic standard. After investing borrowed funds in infrastructure projects, the government found itself unable to service these debts in an environment of inflation and a depreciating peso. The resolution of the crisis required emergency central bank cooperation. Barings was rescued by the Bank of England, which arranged gold loans from the Banque de France and Russia's central bank. Likewise, in 1906-07, heavy US borrowing drained gold from the Bank of England, but a damaging rise in interest rates was avoided through loans from the Banque de France and the German Reichsbank (Toniolo 2005, p.15). These early

[4] The most important political events between 1815 and 1914 were: Revolutions: 1830 and 1848, wars: Crimean War (1853-56), US Civil War (1861-65), Austro-Prussian War (1866), Franco-Prussian War (1870-71), the Spanish-American War (1898), the Boer War (1899-1902), Balkan Wars (1912-13).

examples of central bank cooperation show how central bankers could perceive themselves as a collective group with common interests in preserving the stability of the international monetary system.

Of course, all explanations have their weaknesses. First, even in countries with a full-fledged democracy for male voters since 1848, as in France and Switzerland, the metallic standard was not challenged by the public. Second, central bankers were absolutely aware that raising interest rates would hurt the economy (Sayers 1957, cited by Bordo and MacDonald eds, p. 69; Morys 2013 cites protocols of Austria-Hungary). Third, shocks were maybe not as big as during the first half of the 20th century, but they had the potential to destroy the international monetary regime. Reinhart and Rogoff identify 24 banking crises in high and middle income countries during the period of high capital mobility from 1880-1914 (Reinhart and Rogoff, 2009: 344-45).[5] And fourth, the concerted interventions by central bankers were a response to exceptional strains rather than a key function of the everyday operation of the gold standard. For the most part central banks acted in their own national interest with little spirit of coordination for its own sake (Flandreau 1997).

Nevertheless, despite these objections, it is clear that historical circumstances provided a strong basis for the credibility of the classical gold standard. Central banks were only successful in managing the international monetary system because the classical gold standard was compatible with the political environment, both domestically and internationally. This is not to say that there was no threat to stability (Bordo and Capie 1993, Intro, pp. 5-6; Bordo and Schwartz 1999, pp. 160-161; Eichengreen 1996, pp. 41-42). But it would be wrong to argue that the collapse of the classical gold standard was inevitable in 1914.

[5] Major financial crises between 1815 and 1914 were: In Britain: 1825, 1836-39, 1847, 1857 and 1866 (Capie 2009). In France: 1818, 1840, 1848 and 1851 (White 2011, p. 79). In the US, the most important financial panics are the following: 1819, 1837, 1857, 1873, 1884, 1893, 1896 and 1907 (Calomiris 2011, p. 104).

3. Central banks and the collapse of the interwar gold standard

During the interwar years, central banks struggled to sustain the restored gold-based international monetary regime afloat that was reconstructed after the war. In the 1920s most governments pursued a concerted effort to return to 'normal' by restoring the gold value of their currencies. Starting in 1931, the gold exchange standard collapsed, and subsequently central banks in Britain, France, Germany and the United States lost their independence. However, as we will argue, their responsibility for the Great Depression has been overemphasized. They made mistakes, but the fundamental problem was that the international monetary regime was not compatible with the dynamics of both international and domestic politics (Ritschl and Straumann 2010). Central banks had full instrument independence, but centrifugal forces proved much too strong.

Ex ante, things were not looking as bad as they did ex post. The postwar stabilization after 1918 was a direct consequence of the contingent gold standard rules and resembled what happened after the Napoleonic Wars and the American Civil War. The debate after 1918 echoed in many ways the Bullionist debate more than a hundred years earlier, when English politicians, bankers and economists debated the pros and cons of convertibility. But there was an important difference to earlier periods. The inter-war gold standard was the result of repeated international conferences that brought government officials and central bank governors together to discuss the redesign of the international monetary system. The delegates at the Genoa International Economic Conference in 1922 explicitly recommended that central bank cooperation was a vital aspect of a prospective new gold standard and that this should be institutionalized in a convention or 'entente'.[6] This new focus on central bank independence and cooperation to manage the international monetary system particularly reflected the views of the Governor of the Bank of England Montagu Norman, and the Benjamin Strong, first Governor of the Federal Reserve Bank, who together promoted close relations and cooperation. In Britain, Norman joined with the UK Treasury to push the inexperienced Chancellor of the Exchequer Winston Churchill to return speedily to the gold standard in

[6] Papers relating to International Economic Conference, Genoa, April-May 1922, London: HMSO, p. 60.

1925 (Boyce, 2005; 222-23). The enhanced prominence of these key central bankers helped to promote the role of central banks in the global system.

The interwar gold exchange standard launched a new era of central banking outside Europe. The First World War prompted a surge of state-building that included a desire to have national central banks as part of the apparatus of independent policy-making. Central banks were also an important tool to operate the inter-war gold exchange standard. Governor Montagu Norman of the Bank of England promoted a network of central banks modeled on the Bank of England that could cooperate to deliver 'orthodox' policies aimed at monetary and exchange rate stability. His vision was supported by the Financial Committee of the League of Nations, which sent missions to a range of central European states in the mid-1920s as part of the general spirit of creating a coordinated international monetary system. Sir Otto Niemeyer and other officials from the Bank of England toured a range of emerging markets to advise on monetary policy, 'sound money' and to promote the establishment or reform of independent central banks. His advice was sometimes controversial, for example, in Australia where his recommendations of austerity to restore exchange rate stability and to allow the national debt to be serviced were greeted with indignation (Attard, 1992; 82). Many Western Hemisphere states looked to the USA and Edwin Kemmerer of the Federal Reserve Bank toured a range of countries from 1917-1931 advising on the organization of central banks, including Colombia, Chile, Ecuador, Bolivia and Peru (Singleton, 2011; 60). Table 3 shows a range of central banks designed by the League of Nations and Bank of England advisers. In the end, these central banks lasted much longer than the international monetary system that they were designed to deliver.

Table 3: Central Banks and International Missions in the Inter-war Period

Countries	**Year**	**Mission**	**Outcome**
South Africa	1920	Sir Harry Strakosch	South African Reserve Bank
Austria	1923	League of Nations	Austrian National Bank
Poland	1923	League of Nations	Reorganised National Bank into central bank
Free State of Danzig	1923	League of Nations	Bank of Danzig
Hungary	1924	League of Nations	National Bank reorganized into central bank
Czechoslovakia	1926	League of Nations	National Bank of Czechoslovakia
Estonia	1927	League of Nations	National Bank reorganized into central bank
Bulgaria	1928	League of Nations	National Bank reorganized into central bank
Greece	1928	League of Nations	Central Bank of Greece
Australia	1930	Sir Otto Niemeyer	Commonwealth Bank reorganized into central bank?
New Zealand	1930	Sir Otto	Central Reserve Bank of NZ

		Niemeyer	1934
Brazil	1931	Sir Otto Niemeyer	Bank of Brazil reorganized into central bank
Canada	1933	Lord Macmillan, Sir Charles Addis	Bank of Canada
India	1933	Sir Ernest Harvey, W.H. Clegg	Central Reserve Bank of India
El Salvador	1934	F.F.J. Powell	Central Reserve Bank of El Salvador
Argentina	1935	Sir Otto Niemeyer	Central Bank of Argentine
China	1935	Sir Frederick Leith-Ross	Currency reform: sterling/dollar peg
Egypt	1936	Sir Otto Niemeyer	National Bank of Egypt reorganized into central bank

The restored international monetary system was a haphazard inconsistent adoption of a pegged gold exchange standard, which relied more on sterling and other national currencies as foreign exchange reserves. Exchange rates tended to reflect political targets rather than economic realities. Thus, sterling and the lira were pegged at their pre-war parities despite significant changes in their global economic standing. The French franc was stabilized at a greatly devalued rate compared to 1900, prompting inflationary pressures and the accumulation of reserves. Politics over-rode economic reality and central bankers who were left managing the system were unable to fend off market pressures that led ultimately to a global banking and financial crisis in 1931, ironically just after the founding of the Bank for International Settlements seemed to be fulfilling the central bank association that was the ‘dream of Genoa’ (Toniolo, 2005; p. 20 quoting Bank of England’s Charles Addis in 1929).

When the cost of maintaining the international system became too high in the contagious financial crisis of the 1930s, the mood shifted radically and states abandoned the struggle to fight the market and suspended the gold standard. The international system was swiftly fragmented into currency and trade blocs. The interwar gold standard failed to provide the two global public goods in times of crises: international currencies and external stability. In 1931 there was a shortage of liquidity, and currencies tumbled the gold standard one after another. Germany introduced capital controls in the summer of 1931, and Britain took sterling off gold in the autumn of the same year. The US followed in the spring of 1933, France in the fall of 1936. The experiment with a deliberately constructed specie based system had failed.

Why were central banks not able to prevent the regime from collapsing? They certainly made several mistakes, not only from today's perspective, but also in the eyes of critical contemporaries such as Fisher or Keynes. Especially the Fed could have done more to contain the banking panics of the 1930s. Instead of pursuing an expansionary monetary policy to stabilise the money supply, it concentrated on keeping the monetary base constant (Friedman and Schwartz 1963, Meltzer 2003). Admittedly, the US banking system was particularly weak due to the high share of unit banking, but there is no doubt that the Fed could have done more to mitigate the negative macroeconomic consequences of the banking crises in the early 1930s (Carlson and Mitchener 2009, Calomiris 2011). Certainly central banks bore some of the responsibility.

Yet, it would be too easy to put all the blame on the shoulders of central bankers. In the USA the Fed was arguably following one of its main rules, namely to preserve convertibility. In Germany, Hans Luther was perhaps not the best central banker in German history, but he had little room to maneuver once a run on the German currency developed in the challenging political and economic climate (James 2013, p. 125). Open credit lines provided by France, the UK or the US may have made a crucial difference, but central bankers were inhibited by political obstacles from offering substantial credits to Germany. And once the German crisis escalated, sterling quickly followed, pushed on my domestic political stalemate over government spending and taxation that undermined credibility in the ability of politicians to restore prosperity. The combination of an overvalued currency, the political costs of austerity, and a drain of foreign reserves as a result of the international liquidity crisis forced the

government to suspend the gold standard in September 1931. From then, it was only a matter of time until the US and France devalued their currencies as well.

Furthermore, not only central bankers, but most politicians were in favor of prioritising nominal exchange rate stability. Even after the suspension of the gold standard the authorities remained conservative with respect to any regime change and their preference was usually in favour of stable or pegged exchange rates. During the inter-war economic crisis, centre-right politicians as well as Social Democrats and trade union officials were reluctant to abandon the gold standard, even though the monetary straitjacket reinforced the slump (Eichengreen and Temin 2000). The most notorious example is the slow dissolution of the Gold Bloc in the 1930s. Most independent observers predicted that it was a futile exercise to maintain the existing parity after the UK and the US left the gold standard in September 1931 and April 1933 respectively. But France together with Belgium, Italy, the Netherlands, Poland, and Switzerland defended their deflationary policies within a Gold Bloc until the domestic political support had crumbled in the mid 1930s (Feinstein, Temin and Toniolo 1997). Even after the interwar gold standard collapsed in the 1930s, both governments and central banks in many countries aimed to minimise exchange rate fluctuations because floating was believed to introduce uncertainty and transactions costs harmful to trade. In June 1933 the Bank of England, Banque de France and the Fed agreed to try to stabilize the gold price of their currencies but they were over-ridden by President Roosevelt's desire to retain domestic monetary policy sovereignty (Feinstein, Temin, Toniolo, 2008). From 1933, therefore, the international monetary system came to look more like a prototype of the Bretton Woods system than a system of freely floating exchange rates. Sterling broke the peg to gold in September 1931, but most of Britain's main suppliers of food and raw materials retained their peg to sterling as part of the sterling bloc. Only in Sweden was there serious consideration of abandon the peg for price level targeting, but the Riksbank was very reluctant to adopt the proposals made by Swedish economists (Berg and Jonung 1999, Straumann and Woitek 2009).

In the inter-war period, central bankers no doubt made monumental mistakes in policy that aggravated the Great Depression, but they were operating in difficult circumstances. They were responsible for maintaining the international monetary system, while governments failed to address the roots of imbalances, namely the conflict between the former war powers and

domestic instability. There were many reasons for why the political environment had changed relative to the era of the classical gold standard. By 1920, universal suffrage had become the norm in Western countries and the trauma of the First World War altered expectations about the responsibilities of the state for welfare. At the same time greater fiscal debt and price instability strengthened the reorientation towards domestic policy goals and the importance of monetary policy sovereignty. The Allied powers had different interests with respect to German reparations, with the US reluctant to adopt the role of the leader (Kindleberger 1973). Faced with these severe contradictions, central banks failed to stabilize the international monetary regime, but this was likely an impossible task. In the process several lessons were learned about the need for greater coordination that influenced the post-WWII settlement.

4. Central bank cooperation and the end of the Bretton Woods system

Immediately after the Second World War, central bankers were not central to the design and strategic management of the international monetary system, although they retained operational responsibilities. As the Bretton Woods system evolved, central bankers devised ways to cooperate in order to overcome weaknesses in the pegged exchange rate system, thus gaining back some of the lost ground. By the end of the 1960s, however, international imbalances had become too large to be ameliorated by central bank cooperation. Once more, central banks faced increasingly powerful diverging national interests among governments that meant that the international monetary regime had become incompatible with the political environment.

With hindsight, it is hard to understand why after 1945 the world went back to a system of fixed exchange rates. Similar to the period after the disastrous conflict of 1914-1918, there was a broad consensus that stable exchange rates offered the best prospect for global recovery. The damaging political as well as economic effects of the apparent ‘currency wars’ of the 1930s prompted a return to the doctrine of stable exchange rates after the interregnum of the Second World War. The Bretton Woods system was based on a consensus built during the war that international capital markets were dangerous to orderly global integration, that international trade liberalization was the primary means to ensure sustained economic growth and that stable exchange rates encouraged economic cooperation and reduced transactions

costs (Schenk, 2010; Chwieroth, 2010). Importantly, the blueprint for Bretton Woods was not led by central banks but by Treasury officials in the UK (John Maynard Keynes) and USA (Harry Dexter White). This reflects the heightened political atmosphere in which the two main allied nations developed their plans for the postwar monetary system. The failure of economic cooperation and coordination in the interwar period and the damaging flows of hot money that characterized the European financial crisis of 1931 were to be avoided through a managed stable exchange rate with convertibility of currencies for current account purposes but a sustained reliance on capital controls to protect national monetary independence.

Rather than focusing on the mainly self-interested actions of national central banks established during the gold standard eras, this new system created a distinctive specialist international monetary institution to monitor stable exchange rates. The International Monetary Fund (IMF) was designed to provide the international economic cooperation that was essential to a lasting world peace, in contrast to US isolationism and European economic nationalism of the 1930s. Central bankers were excluded from the formal governance of the system, which was led by the Executive Board of the International Monetary Fund – itself made up of nominees from among state bureaucracies. But, as we shall see, the flaws in the system led to a new role for the Bank for International Settlements to provide supporting apparatus that drew central bankers back to the core of the international monetary system.

Formally, all core countries were part of the system between 1947 and 1973; only Canada in the 1950s really experimented with a floating exchange rate at this time, although the commitment to a free float is debated (Siklos 2009; Helleiner 2005). But while the Bretton Woods regime may have been based on a common set of rules, there was hardly any year in which these rules were followed by all major members. There were frequent adjustments in the values of international currencies against the dollar that undermined the credibility of the system (e.g. devaluation of all European currencies 1949, DM revaluation 1961, sterling devaluation 1967, franc devaluation 1969, DM float 1969). Within the Bretton Woods regime, regional or currency-based systems emerged as it became clear that the comprehensive international payments system based on convertible currencies would be delayed indeterminately. Among European states the European Payments Union provided a clearing system based on gold and dollars from 1950-1958 that facilitated a form of convertibility of European currencies. Current account convertibility, the cornerstone of the

original Bretton Woods framework of multilateralism, was only achieved at the end of 1958 for most European currencies (Kaplan and Schleiminger, 1989).

At the same time, the UK was the centre of the sterling area group of countries from 1945-1972, which pooled their foreign exchange reserves at the Bank of England and operated exchange controls against the dollar in return for freer access to the London capital market (Schenk, 2010). These countries included major primary product producers such as Australia, New Zealand and South Africa as well as oil producers in the Middle East such as Kuwait, Iraq and Persian Gulf States. British colonies such as Hong Kong, Singapore, Malaysia, Nigeria and Ghana, Kenya and Tanganyika operated currency boards linked to sterling. French colonies and former colonies in Africa operated currency boards based on the franc and formed the Franc Area. The Bank of England had as its primary responsibility the maintenance of the pegged exchange rate and the management of the foreign exchange reserves.

Controlled capital markets and pegged exchange rates focused attention on defending balance of payments equilibrium during the building of comprehensive welfare states in many European countries and the liberalization of trade flows. Germany's interwar experience of hyperinflation meant that the Bundesbank was particularly averse to inflation and pressed its influence over the government to restrain any risk to price stability. At the same time the Bundesbank vigorously resisted adjusting the DM exchange rate to combat inflationary pressure, seeking instead to put pressure on domestic economic policy, but it was over-ruled by the West German government in the early 1960s (Neumann, 1999: 297-8). The Bank of England was also wedded to the importance of a stable exchange rate as the foundation of the international financial leadership of the City of London as well as a constraint on successive government's tendency toward inflationary growth policy. This led to a series of sometimes heated battles between the Bank of England and the government (Schenk, 2004). Central bankers tended to be strong advocates of exchange rate stability both because they believed this led to more orderly international markets and because fixed rates exercised discipline over government economic policy.

Flaws in the operation of the IMF created opportunities for central bankers to reassert their influence over the governance of the international monetary system. It took much longer to establish the conditions for freeing up exchange controls than had been anticipated at the

Bretton Woods conference in 1944. Current account convertibility was generally delayed for 12 years beyond the inauguration of the IMF, so the system of multilateral payments designed at Bretton Woods could not come into practice. Borrowing from the IMF was also restrained initially by the alternative flow of Marshall Aid from 1947 and then by uncertainty about the conditionality that might be imposed on the economic policy of debtor governments. The IMF Executive Board and staff became a large bureaucratic organization focused on annual inspections of each member country's exchange controls and lacked the spontaneity and flexibility to deal with the periodic crises that threatened the pegged exchange rate regime. Meanwhile, G10 central bank governors met monthly at the Bank for International Settlements in Basel Switzerland to discuss issues of mutual interest informally. This provided an alternative forum for the exchange of information about foreign exchange market intervention and coordinated support among central banks (Toniolo, 2005; Schenk 2010). Without being exposed to public scrutiny in their discussions or publicity for their operations, the Board of Governors of G10 (plus Switzerland) central banks were able to respond more nimbly to strains in the system.[7] There were two main routes through which the central bankers at Basel co-operated; lines of credit and the Gold Pool.

In March 1961, when the fixed US$ gold price of $35/oz came under pressure, the Federal Reserve Bank benefited from bilateral loans and sales of gold organized through the BIS. Three months later a more concerted line of credit (peaking at $904 million) was offered to support the Sterling exchange rate and a second support scheme was organized in the summer of 1963 ($250 million) (Toniolo, 2005; 382-3). The subsequent easing of market pressure and quick repayment of the arrangements persuaded central bankers that through concerted cooperation they could defend the international monetary system from attack by speculators. Sterling was a particular beneficiary of these schemes (Schenk 2010), but other currencies including the Lira (1964) were also supported through successive lines of credit organized quickly (sometimes overnight by telephone) among central bankers. In addition, and sometimes in concert, the US Federal Reserve engaged in substantial bilateral swaps with a range of central banks in Europe and beyond to provide extra liquidity, beginning in 1962 with a $50 million swap line with the Banque de France. By 1978 the Fed's swap network had

[7] Countries included Sweden, UK, France, Belgium, Netherlands, Italy, USA, Canada, Japan

grown to a total of $30 billion (Toniolo, 2005; 387). What is particularly important about these networks of cooperation to support the international monetary system is that they did not require parliamentary approval and were not always made public in the way that inter-governmental loans were required to be.

As the international monetary system came under increasing pressure, the focus of attack was on sterling and the arrangements to support that currency were enhanced (Schenk, 2010; Ch.8). In June 1966 the Bank of England negotiated a 'Group Arrangement' of swap credits for up to $600 million from other G10 central banks at Basel. The facility was under-used and easily renewed in March 1967. But this time the entire amount was drawn in the crisis that preceded the devaluation of sterling in November 1967. A second 'Group Arrangement' in 1968 (known as the Basel Agreement) became much more public and the terms of the credit were more onerous. This time, the Bank of England's creditor central banks required the British government to negotiate agreements with major sterling holders to maintain the ratio of sterling in their reserves. This could only be achieved through a guarantee of the dollar value of these reserves. An elaborate network of 34 bilateral Sterling Agreements was quickly concluded in order for the Bank of England to claim the $2 billion line of credit. Although at its height the British drawing was only $600 million, the psychological effect of this cushion of credit was believed to have quietened the market and restored credibility to the sterling exchange rate until the summer of 1972. While central banks did not have a statutory role in the operations and support for the international monetary system, it was clear that they established institutional frameworks that allowed it to survive through the 1960s.

The second major effort of coordination among G10 central banks was initiated by the IMF and government Treasuries. Concerned about the diverging market price of gold from the fixed price, the British and American governments developed a plan in 1961 for G10 central banks to cooperate to stabilize the London gold market. Toniolo (2005; 375-81) relates how central bankers were initially reluctant to engage in 'fixing' the market, but were eventually persuaded by the Americans, who arguably had the most to lose from a break in the gold value of the dollar. Each participating central bank earmarked an agreed amount of gold to be used by the Bank of England to intervene in the London market. In the first few years the scheme worked fairly well and deals were modest, but as confidence in the US

dollar waned after the devaluation of sterling in November 1967, sales of gold escalated and the pool suspended operations in March 1968. Thereafter, the market price of gold was allowed to diverge from the fixed $35/oz and the underpinning of the Bretton Woods system was fatally weakened.

Central bankers' various schemes to prop up the Bretton Woods pegged exchange rate system ultimately failed. In the early 1970s, under Chairman Arthur Burns, the US Fed persisted with expansionary monetary policy to counteract unemployment, increasing the pressure on the balance of payments and exposing the divergence of internal and external stability (Meltzer). During the early months of 1971, the US President Nixon and his Secretary of the Treasury John Connally came to view the support of the dollar price of gold as an unbearable burden on the American economy (Schenk 2010). The so-called Nixon Shock of August 1971 suspended the convertibility of the US dollar to gold and threatened import surcharges if surplus countries did not revalue their currencies. Despite this dramatic departure from the Bretton Woods system, the renewed commitment to adjusted pegged exchange rates through the Smithsonian Agreement in December of 1971 demonstrates the tenacity with which governments of the G10 sought to avoid floating exchange rates. Within six months, however, the markets had tested the credibility of the new parities. From August to December 1971, despite the growing consensus among professional economists, policy-makers and central bankers clung to the pegged exchange rate regime, going through considerable contortions to replace it at different exchange rates under the Smithsonian Agreement. This patch on the system was short-lived with the float of sterling in June 1972 and of European currencies and the Yen in February/March 1973. Even the float of sterling was only meant to be temporary until a (defendable) new equilibrium rate could be found; it was chosen because the government did not think that another pegged rate would be credible (Schenk 2010). The members of the IMF only formally embraced the new mixture of floating and managed exchange rates system in 1976.

Once again, the system had proved incompatible with the political environment. In the late 1960s the postwar social and political consensus came to an end in many countries, not only on the university campuses, but also in the wage agreements between employers and workers. Expansionary monetary policies and the lack of wage restraint reinforced each other and resulted in higher inflation expectations, thus bringing instability and a loss of confidence in

the dollar. One major destabilizing political factor was the escalation of the war in Vietnam which lessened the US government's commitment to price stability. With divergent national economic policy priorities and goals, the float of most core currencies against the dollar ushered in a decade of instability punctuated by commodity and asset price shocks through the 1970s.

5. The shift to floating exchange rates and the rise of central banks

The end of the Bretton Woods system ushered in a new era in the history of the international monetary regime. Its main feature has been the mixture of floating and managed exchange rates. Many countries, notably the USA, the UK and Japan, abandoned their fixed exchange rate regime in 1973 and since then have aimed at stabilizing domestic inflation. By contrast, France, Germany and most other members of the European Union have delegated their monetary sovereignty to the European Central Bank (ECB), while the euro itself is a floating currency. Many countries in East Asia, most notably China, have tried to keep their exchange rate stable against the dollar to foster export-led growth and have accumulated foreign exchange reserves as insurance against future crises. Still others have alternated between floating and pegged exchange rate regimes (Klein and Shambaugh 2010).

The post-1973 international monetary regime is perhaps best characterized as a dollar standard, because the US currency has remained the dominant unit of account, the preferred means of settlement and the most popular reserve currency. The Euro has not become a serious challenge to the dollar yet. The institutional foundation for the single European currency remains incomplete and remains a threat to international monetary stability for the time being. The euro crisis of 2010 revealed the fragility of the system and the asymmetric effects to which a collection of diverse states in a single monetary union are prone. It has required considerable political will to overcome the crisis and ensure that the single currency solution continued. Eurosystem members have created a rescue fund (European Stability Mechanism) and have laid the basis for a banking union. But the architecture is still fragile. In order to become a serious alternative to the dollar, the euro needs to have more integrated financial markets, fiscal policy coordination and more flexibility of factor markets.

In more recent times, the Chinese Renminbi has been identified as a potential new rival for the dollar. But, as with the euro, it seems premature to predict its imminent supremacy since

this would require the Chinese government to liberalize the capital account, which entails financial and political risks. Therefore the Chinese authorities have chosen a stepwise approach by establishing off-shore trading platforms and enhancing bilateral trade payments using the Chinese currency while preserving capital controls to insulate the domestic monetary and financial system from external shocks. Meanwhile the People's Bank of China has grappled with intense domestic monetary strains posed partly by its pegged rate policy during the 2000s when enormous balance of payments surpluses threatened price stability through internal and external capital controls. Thus, despite the seismic shocks to the global financial system, the ascendency of the dollar persisted.

The dollar standard went through two distinctive phases. The first phase, lasting from 1973 to 1979, was characterized by a high degree of instability. Inflation rates within the core diverged considerably; West Germany and Japan restoring price stability after the first oil shock, while France, the UK and the USA gave priority to full employment over price stability. As a result, exchange rates became very volatile. Outside the G7, other groups of countries were set adrift by the float of the dollar in the 1970s, prompting a more stratified global system.[8] Developing economies faced particular obstacles to adopting floating exchange rates with relatively thin local foreign exchange markets and vulnerability to seasonal instability due to dependence on primary product production. Also, the 'seal of approval' (Bordo and Rockoff 1996) identified for peripheral states in the classic 19th century that enhanced their ability to borrow in global capital markets appeared to persist for emerging and developing economies a century later. As a result, many countries continued to peg their exchange rates to the dollar as a commitment mechanism. When pegging to a depreciating dollar became uncomfortable in the inflationary era of the 1970s, some opted for adjustable pegs or pegged to trade weighted baskets (Schenk and Singleton, 2014).

The second phase started in the late 1970s when the USA, the UK and a series of other OECD countries began to rein in inflation regardless of the short-term cost to employment. As a result, exchange rate volatility decreased, and the international monetary system gained in stability. The era of the Great Moderation from the 1980s to 2008 achieved consistently low

[8] G7 included USA, Japan, Canada, UK, Germany, France, Italy.

inflation rates in most of the industrialized world and the financial and currency crises that punctuated this stability had mainly regional effects, although these were at times severe. The success of macroeconomic policies in the 1980s encouraged the member states of the European Economic Community (EEC) – since 1992 the European Union (EU) – to move inexorably toward monetary union by introducing the euro in 1999 (Mourlon-Druol, 2012).

During the 1990s, a consensus emerged that countries should adopt either a 'hard peg' that had strong credibility through a currency board of currency substitution, or they should freely float their exchange rate (Mussa et al. 2000; Fischer, 2001). This bi-polar view reflected the repeated failures to defend pegged rates against market attack and the mixed record of experiments with sterilized intervention in foreign exchange markets. Direct operations by central banks in the foreign exchange market alone seemed to have at best short term effects; to be more effective they required buttressing monetary policies. In the same period, however, financial and currency crises in emerging markets stretching from Mexico in 1994 to the Asian Financial Crisis of 1997, the Rouble crisis of 1999 and the Argentinian crisis of 2002 pushed most of these countries to resort to floating exchange rates. In particular, the collapse of Argentina's currency board cast doubt on the bipolar solution. Indeed, the IMF argued in 2011 that emerging markets with pegged exchange rates were more vulnerable to currency and financial crises. With little theoretical support for intermediate regimes, emerging market economies were urged to follow the USA in a free float, but most exhibited a so-called 'fear of floating' (Calvo and Reinhart, 2002). While many claimed to float, in fact the incidence of intervention and capital control was more prevalent in practice (Reinhart and Rogoff, 2004). Meanwhile, wide fluctuations in exchange rates among core countries such as the USA, Japan and Europe threatened to have damaging consequences for smaller countries.

Among emerging markets, the share of countries that have a pegged or a managed floating exchange rate is still far higher than the share of countries with a freely floating exchange rate. According to the IMF de facto classification for the year 2007, 98 had a pegged exchange rate[9], 4 a crawling peg, 56 a floating exchange rate, and only 16 a freely floating exchange rate (Table 4). By 2009 the IMF analysis based on de facto regimes (rather than de

[9] Including regional agreements like the West African Economic and Monetary Union.

jure) determined that economies with a formal pegged rate regime had a better record for inflation. But growth performance was better with an intermediate system, for example by not adopting a strict bilateral peg to another currency.

Table 4: IMF de facto classification of exchange rate regimes for emerging markets for the year (Source IMF 2009)

Emerging markets with freely floating exchange rate	**Emerging markets with Managed floating exchange rate**	**Emerging markets with pegged exchange rate**
Brazil	Columbia	Hungary
Chile	Peru	Qatar
Korea	Czech Republic	United Arab Emirates (UAE)
Mexico	Egypt	China
Philippines	Russia	
Poland	India	
South Africa	Indonesia	
Turkey	Malaysia	
	Thailand	
	Malaysia	

Note: no classification for Taiwan.

Some scholars have interpreted the persistence of stable exchange rates among emerging markets as a sign of a revived Bretton Woods system (Dooley, Folkerts-Landau and Garber 2004). The accumulation of dollar reserves among Asian countries as a result of undervalued

pegs against a depreciating dollar since 2000 is compared to the similar surpluses accumulated by rapidly growing Japanese and West German economies in the 1960s. Due to cheap imports from Asia, inflationary pressure in the US has declined, leading the Fed to keep real interest rates at a historic low. Asian central banks suffer from the low US yields, but are willing to accept them as long as the growth strategy is seen as vital for political and social stability. Whether this mutual dependence between Asia and the US justifies speaking of a revived Bretton Woods system, is open to debate. But the behavior of Asian countries strongly confirms the impression that the dollar standard can be considered an international monetary regime from 1980, based on structural relations, rather than a 'non-system' of exchange rate regimes.

What role have central banks played in this new international monetary system? As for the period between 1973 and 1979, most of them either proved helpless in containing price and exchange rate volatility or at worst reinforced the fragility of the system. Lacking statutory independence (except in a few countries like Western Germany and Switzerland) they were subject to the political business cycle which resulted into high and persistent inflation. In particular, the Fed focused almost exclusively on domestic issues, causing frequent plunges and reversals in the real value of the dollar that increased the fragility of the international financial system. Overall, the 1970s were one of the low points in the history of modern central banking. The combination of political dependence and international policy divergence made it impossible for them to stabilize the monetary system.

Towards the end of the decade the situation began to change. The successful reduction of inflation in the mid-1970s by the Bundesbank and the Swiss National Bank became the template for other countries to restore price stability (Bernanke et al. 1999). In this process central banks seized the moment to reaffirm their position vis-a-vis their governments. Notably, the Fed experienced a comeback under Paul Volcker (formerly Under Secretary of the Treasury for Monetary Affairs) who used his tenure as chairman to operate an aggressive monetary policy that successfully cut inflation in the USA and contributed to wider systemic stability. His determined and successful actions also strengthened the independent status of the central bank. Alan Greenspan, Volcker's successor from 1987, allowed real interest rates to decline further in an environment of stable inflation and reduced business cycle volatility. When Greenspan's successor Ben Bernanke took office in February of 2006, he was quickly

confronted with the global financial crisis of 2007-09 and its repercussions. The Fed provided a range of lifelines to prevent the financial system from collapsing, pushed the federal funds rate to the zero lower bound, and initiated several rounds of quantitative easing. So far, it has been successful in preventing a severe depression coupled with deflation. And most importantly, central bank independence, though questioned by some members of Congress, is still in place.

The reemphasis on domestic policy goals and the abandonment of managed exchange rates marked a turning point for relations between central banks and governments in all core countries (Cukierman 1992). The move to inflation targeting in the early 1990s reinforced the trend for central banks to become legally independent from the government. This institutional innovation shields them from domestic political concerns and aims to promote longer term focus on stable prices (Berger et al. 2002). In a more flexible exchange rate regime, central banks in the main industrialized countries have thus enhanced their independent influence over markets. At the same time, however, their role in the international monetary system has been marginalized as their range of policy targets has been reduced. Nevertheless, a keen awareness of the interdependence of national economic policies means that institutional independence from their national governments has not resulted in an absence of international cooperation among central bankers. The backbone of central bank cooperation has continued to be the Board of Governors of the BIS. It has served as the major institutional forum for central banks to develop relationships which allow a coordinated response to changes in the international monetary system and has adapted to the shifting complexion of international economic relations. With the rise of emerging market economies such as China, Brazil and Russia as important players, the BIS Board of Directors was expanded to 21 members in 2005. Among the original members the central bank Governors of Belgium, France, Germany, Italy, the UK and the US (plus an extra representative from each of these countries) continue to have a seat, but they are joined by an additional 9 elected governors of other central banks. This expansion makes the organization more representative, but it has also altered the practical nature of the meetings, the informality and traditions of the cooperative structures in place since the financial crisis of 1931.

Other multilateral and bilateral cooperative institutions for central banking operate alongside the BIS. Bilateral cooperation through central bank swaps continues to be an

important element of the management of the international monetary system. For example in December 2007 the Federal Reserve authorized bilateral swap facilities with 14 central banks to sustain liquidity when there were strains in global short term dollar funding markets. The dollar swap lines were predominantly used by the ECB, Swiss National Bank and the Bank of England in 2008-9.[10] In a multilateral forum, central bank governors meet alongside finance ministerse at the regular G7 summits that began in the late 1970s, prompted by a desire to moderate 'excessive' volatility and 'disorderly' exchange rates that were blamed for 'adverse implications for economic and financial stability'. At each summit the participants reassert their commitment to market determined exchange rates but also signal their determination to 'cooperate as appropriate'.[11] Central bank governors are also sometimes named as alternate representatives at the IMF Board of Governors (Bodea and Huemer, 2010). But the effectiveness of central bank operations in stabilizing exchange rate dynamics has been controversial.

Many countries also choose to intervene in exchange markets from time to time to stabilize nominal rates and central banks have an operational role in this task. Mostly, the intervention is sterilized to insulate the domestic monetary base and a consensus emerged in the 1990s that such sterilized intervention was generally ineffective, although there have been exceptions where the market accepted that the interventions signaled future changes in economic policy and fundamentals. After a substantial appreciation of the US dollar against the DM in 1984, for example, there was a coordinated intervention by the Bundesbank, the Federal Reserve System and the Bank of Japan in early 1985. This was followed by a series of large and well publicized interventions in the late 1980s and early 1990s by G5 central banks to moderate fluctuations of the core industrialised countries' currencies as part of the Plaza Agreement of 1985 and the Louvre Accord of 1987 (Dominguez, 1998; Sarno and Taylor, 2001). From the early 2000s, however, central banks in the main industrialised countries withdrew from foreign exchange intervention.

[10] http://www.federalreserve.gov/newsevents/reform_swaplines.htm

[11] Quotations from the 2013 G7 Ministers and Governors' statement.

Central banks in emerging market economies have tended to intervene more in exchange markets to dampen volatility, curb speculation or to influence the level of exchange rate during the 2000s (Mohanty and Bat-el Berger, 2013; Menkhoff, 2013). In the wake of the 2008 global financial crisis the priority of domestic economic stabilization resulted in rapid monetary expansion in the USA and other industrialized economies as they sought to avoid the deflationary spiral of the 1930s Great Depression. This introduced a new era of uncoordinated monetary policies and exchange rate instability that created negative externalities for many emerging market economies that have suffered from appreciating nominal exchange rates as the dollar depreciated. Because nominal exchange rate changes can affect domestic prices, central banks in emerging market economies have thus intervened in foreign exchange markets to support their inflation targeting. The asymmetric onus of adjustment between the USA and emerging market economies has in turn led to new calls for reform of the international monetary and financial architecture.

Surveying the period since 1979, the international monetary regime has so far delivered the two public goods – international currencies and external stability – for most of the time, and central banks have contributed to international monetary stability, although the system has been quite heterogeneous and gone through different crises. The crucial variable has been the independence of central banks, which has enabled them to preserve price stability against the short-term interests of the government and to take extraordinary measures in times of crisis. The other variable, the degree of international policy convergence, seems to have been less relevant since 1979. There were times when the core nations pursued different policy goals, but the international monetary system was not threatened by this divergence, thanks to the floating exchange rate regimes in the core countries. Of course, our overall positive assessment of what central banks have achieved over the last few decades may be premature. At the time of writing, the negative consequences of the global financial crisis are still not digested.

6. Conclusion

This survey has discussed the question of how central banks in the core economies contributed to the stability of the international monetary system. Our hypothesis is that the

combination of three variables answers this question: the exchange rate system, the degree of international policy convergence, and the extent of central bank independence. Under a system of fixed exchange rates central banks can play a constructive role only when there is a high degree of international policy convergence, while central bank independence is secondary. By contrast, under a system of floating exchange rates central bank independence is the crucial variable, while the degree of international policy convergence is less important.

We have traced the historical development from the 19th century when the management of national currencies emerged as an important policy instrument and central banks were required to operationalize the gold standard in most countries, which proved to be quite stable. The underlying reason was that from the 1870s to 1914 core countries adhered to the same liberal principles, and central bankers were able to use their room of maneuver in a constructive way thanks to this strong liberal consensus. Fixed exchange rates in the 20th century, however, were not sustainable due to the lack of common goals and interests. Central banks were not able to overcome the centrifugal political as well as economic forces in the 1920s and the 1960s, even though they were independent in the first period and collaborated extensively in the latter one.

Subsequently, the system of floating exchange rates in the 1970s proved unstable because most central banks, notably the Fed, the Bank of England and the Banque de France, were not independent. They were subject to short-term considerations of the cabinet, political parties and lobbying groups. In the late 1970s, following the German and Swiss example, governments began to free central banks from their political dependence. As a result, the international monetary system became much more stable. Since then, central banks have played a pivotal role in preserving the two public goods any international monetary regime is supposed to provide: international currencies and external stability – perhaps more than ever in history. Central banks also managed to prevent the system from collapsing during the severe financial crisis of 2007-9. They could draw on the range of operations to prop up the fixed exchange rate system deployed in the 1960s, such as bilateral swap network, with the BIS having an important role in bringing central bankers together to exchange views and information confidentially. In contrast to the 1930s, the international monetary order among core economies has not broken down, although the longer term extent and impact of spillover effects on emerging market economies remains unresolved.

Accordingly, praising or blaming central bankers for the functioning of the international monetary system misses the core fact that crucial levers were often outside their reach. While exercising some informal power through their responsibility for operationalizing the decisions of governments over the form of the international monetary system and occasionally influencing the decisions more directly, central banks have generally played a supportive rather than leading role. They have been able to exploit their particular characteristics, such as their technical expertise, their close links with the private sector and their ability to take agile and sometimes secretive action. In the end, however, politics and institutions decide whether or not central banks are able to play a constructive role.

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