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"The Quartet" and Reform of the Exchange Rate System, 1945–73: A Doctrinal-Historical Reconstitution[*]

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During the heyday of the Bretton Woods years, William Fellner, Gottfried Haberler, Fritz Machlup, and Robert Triffin were known as "The Quartet," in recognition of their contributions to international monetary reform. Three of the Quartet members, Haberler, Machlup, and Fellner, have been credited as having been part of a small, select group of economists who foresaw the desirability of, and paved the way to, freely flexible exchange rates, the regime that succeeded the Bretton Woods system in 1973. This paper assesses the views on exchange rates regimes of the members of the Quartet from the mid-1940s to the early-1970s and, in doing so, provides both a reconstitution of the conventional narrative and a window through which the evolving position of the profession at large towards increased exchange rate flexibility can be better understood. In late-1960s and early-1970s, Haberler, Machlup, and Fellner were proponents of a crawling peg regime, a very different arrangement than flexible exchange rates. To provide a frame of comparison, the views of the members of the Quartet on exchange rates are compared with those of Milton Friedman, who advocated floating exchange rates beginning in the late-1940s.

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1. Introduction

In a letter from Fritz Machlup, dated 16 July 1982, jointly addressed to William Fellner, Gottfried Haberler, and Robert Triffin, Machlup recalled: "The four of us were once called 'the Quartet'." Several weeks later, in a letter dated 10 August 1982, Triffin replied: "Dear Fritz, Many thanks for your kind reminder of our happy 'the Quartet,' whose disappearance I feel very sadly."[1] During the heyday of the Bretton Woods years, the Quartet helped set the policy agenda – in both academic and in official circles – dealing with reform of the international monetary system. Three of its members – Machlup, Fellner, and Triffin – founded and led the Bellagio Group, a gathering of academics which met twenty two times from 1963 until 1974, often joined (beginning in the mid-1960s) by senior government officials from the Group of Ten (Connell 2016: 2);[2] the Bellagio Group was formed with the aim of providing a scholarly assessment of the international monetary system to complement the official G10 assessments (see below). Haberler was part of the Bellagio Group from its inception and, as a renowned professor of international economics at Harvard University, added to the prestige of the Bellagio Group; reflecting his prominence in the profession, in late-1968 he chaired President-elect Richard Nixon's task force to reform the Bretton Woods system. Expanding on the contributions of Triffin (1960), Machlup (1962) was among the first economists to spell-out the three problems – confidence, liquidity, and adjustment -- around which most of the literature on the Bretton Woods system has since been organized (Bordo 1993: 28-38; Obstfeld 1993: 203-07; Eichengreen 1993: 621-26).

The Quartet had two lasting influences on the Bretton Woods debates about international monetary reform, through both the contributions of its members, individually, and through the Bellagio Group. First, building on Triffin's *Gold and the Dollar Crisis* (1960), it drew attention to the interconnectedness between the confidence and the liquidity problems, and offered solutions to those problems. Triffin had argued that the process of international reserve creation under the Bretton Woods system had become dynamically unstable because of its over-reliance on the U.S. dollar as the chief source of reserves. Specifically, to supply reserves to the rest of the world,

[1] All letters of correspondence cited in this paper are from the Hoover Institution Library and Archives. See Appendix B for details.

[2] The Group of Ten (G10) is a group of countries that participates in the General Arrangements to Borrow (GAB), an agreement reached in 1962 to provide the IMF with additional funds to increase its lending capacity. The G10 consists of *eleven* countries: Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States.

the United States had to run balance-of-payments deficits. If the United States eliminated those deficits, it would deprive the global economy of international liquidity needed for the expansion of global trade. If the United States continued to provide international liquidity, and with the other main reserve asset, gold, having an inelastic supply, its own reserve position would deteriorate, undermining international confidence in the dollar – the Triffin dilemma. A large number of proposals, including by Triffin and Machlup (separately), was put forth in the 1960s to create new sources of international liquidity. The liquidity problem was thought (by some economists, including Machlup) to have been resolved in 1969 when the IMF was authorized to create special drawing rights (SDRs) “to meet the long-term global need [of liquidity], as and when it arises, to supplement existing reserve assets” (Gold 1971).[3]

Second, after the collapse of the Bretton Woods system in 1973, some studies on the history of the international monetary system have credited members of the Quartet – notably Haberler, Machlup, and, to a lesser extent, Fellner – as part of a small, exclusive group of economists, including Milton Friedman (1953), James Meade (1955), Ego Sohmen (1961), and Harry Johnson (1969), who foresaw the desirability of, and paved the way to, freely flexible exchange rates, the regime that succeeded the Bretton Woods system in 1973, and which has remained in place to the present time. Consider the following:

- In remarks delivered in April 1975 at the International Conference on World Economic Stability, Triffin characterized the works of the proponents of floating exchange rates as “the academic preachings of Professors Friedman, Haberler, Fellner, Machlup, etc.” (Triffin 1976, quoted from Nelson 2025, chap. 7: 658).[4] Earlier, in *Gold and the Dollar Crisis*, Triffin (1960: 77) wrote: “freely fluctuating exchange rates ... increasingly finds favor today with economic theorists -- such as Professors Meade, Friedman, Haberler, etc.”

[3] For a discussion of the impact of the Triffin dilemma on the creation of the SDR, see Kenen (1994: 498-99). Maes with Pasotti (2021: 141) pointed out that Triffin had mixed feelings about the creation of the SDR because it was meant to supplement the roles of the dollar, gold and, to a lesser extent, the pound sterling, in the international monetary system but not to *replace* them.

[4] As discussed below, however, Triffin was not willing to credit advocates of floating exchange rates for the accuracy of their prognostication. In his April 1975 remarks, he attributed the breakdown of the Bretton Woods system to “the inflationary implications of this system” (quoted from Nelson 2025, chap. 7: 658). I thank Ed Nelson for making this source available to me.

- In *The IMF in a Changing World, 1945-85*, an IMF official history of the international monetary system, IMF historian Margaret de Vries (1986: 44) wrote about the early years of the Bretton Woods system: "a few economists, such as Professors Milton Friedman, James Meade, and Gottfried Haberler, began to advocate the use of fluctuating exchange rates." In another IMF publication, de Vries (1985: 101) stated: "Milton Friedman ... was the first to advocate flexible exchange rates.... Shortly afterward, Professors Gottfried Haberler of Harvard University and James Meade of Cambridge University also wrote what have become classic articles advocating flexible rates." Haberler, according to de Vries (1985: 102), was "always a staunch advocate of floating rates."
- In the *New Palgrave Dictionary of Money and Finance*, under the entry "Floating exchange rates," Ronald MacDonald (1992: 130) stated: "The arguments in favour of a country floating its exchange rate were brought sharply into focus by Milton Friedman ... and restated by ... Sohmen (1961), Johnson (1969) and Machlup (1972)." An identical listing of names was subsequently provided by MacDonald in his book, *Exchange Rate Economics* (2007: 30).
- In *Reforming the World Monetary System*, a book on the Bellagio Group, Carol Connell (2016: 16) wrote that economists "led by Milton Friedman and including Machlup, Johnson and Willian Fellner, sought to ... set exchange rates free to float." See, also, Connell (2012: 299).
- In his study, *Rules of the Game: International Money and Exchange Rates,* Ronald McKinnon (1996: 272) listed the following "writers in the 1950s and 1960s who espoused freely floating exchange rates": Friedman, Sohmen, Johnson, and Machlup. An identical listing of authors appeared in McKinnon (1979: 155-56).
- Robert Aliber, a participant (in favor of fixed rates) in the 1960s' debates about fixed-versus-flexible exchange rates, has recently written that "the move to a flexible exchange rate ... was facilitated" by a set of articles and books by Friedman, Haberler, Johnson, and Sohmen (Aliber 2024: 54).[5]

[5] To be sure, there are listings of the progenitors of freely floating exchange rates that do not include members of the Quartet. Most, but not all, listings include Friedman. Irwin (2024: 175) and Obstfeld (2024: 8) each mention only Friedman, Meade and Johnson.

- The notion that Haberler and Machlup were proponents of flexible exchange rates has carried over into the doctrinal literature, in addition to the literature on exchange-rate regimes cited above. In the entry on Haberler in the *Biographical Dictionary of American Economists,* Harold Hagemann (2006: 396-97), referring specifically to "the period after the Second World War," stated: "Like Machlup, Haberler now favored a system of flexible exchange rates." Likewise, in a recent article, Vincent Gayon (2024: 361-62) wrote: "[Haberler] ... was ... a strong early supporter of floating exchange rates ... with Milton Friedman and Fritz Machlup." In a study of the debates on the Bretton Woods system among economists associated with the Mont Pèlerin Society, Matthias Schmelzer (2020: 199) referenced the Society's "advocates of floating exchange rates, most saliently Milton Friedman, Fritz Machlup, and Gottfried Haberler."

In what follows, I assess the views on exchange rate regimes of the members of the Quartet, and, in doing so, I provide a reconstitution of the historical narrative that views Haberler, Machlup, and Fellner as having been early proponents of freely floating exchange rates. I show that the historical record is much-more nuanced. In the mid- and late-1940s, Haberler was a proponent of the Bretton Woods system of fixed-but-adjustable rates.[6] In the mid-1950s, he became a tentative advocate of freely flexible rates. In the late-1960s and the early-1970s he had switched to favor limited exchange-rate flexibility under the crawling peg, a very different exchange rate arrangement from freely floating rates. Machlup expressed an aversion to floating exchange rates into the early-1960s; however, his focus on international monetary reform in the 1960s was on liquidity creation and, thus, the need for a reserve asset to replace or supplement the U.S. dollar, the pound sterling, and gold. Beginning in the mid-1960s, and until the early-1970s, Machlup, became a staunch proponent of the crawling peg. Fellner advocated the crawling peg from the mid-1960s until the breakdown of the Bretton Woods system in the early-1970s.

How does a crawling peg differ from the Bretton Woods adjustable peg? In a monograph, *The Crawling Peg*, John Williamson (1965: 2), who would champion that regime into the 2000s, wrote: "The 'adjustable peg' has come to mean that system under

[6] In his highly regarded 1937 book, *Prosperity and Depression*, Haberler gave what Bordo and James (2001: 21) called a "schizophrenic interpretation" of floating rates in that he saw that they could be advantageous but nevertheless favored fixed exchange rates.

which par changes are carried out infrequently, suddenly, and in a sizable discreate step. The ‘crawling peg’ will be used to mean a system under which such par changes as occur are implemented slowly, in such a large number of small steps as to make the process of exchange-rate adjustment continuous for all practical purposes; a system, therefore, under which the peg crawls from one level to another.” Unlike the narrow bands around central values imposed under Bretton Woods system (± 1 percent), most proponents of the crawling peg favored wider (± 4 percent or ± 5 percent) bands. Williamson also wrote: “Central banks would intervene in the market to stabilize the rate when it approached its current limits” (1965: 3; see also, Williamson 1996: 5). Subsequently, Williamson (2006: 3) contrasted the crawling peg version of flexible exchange rates with Friedman’s version: “The two versions of flexible exchange rates are as different as chalk and cheese.” I assess the differences between the two regimes below.[7]

Several points concerning the following narrative are important to mention at the outset. My focus is primarily on the views on exchange rate regimes for the large industrial countries of Quartet members Haberler, Machlup, and Fellner; I will also have occasion to briefly discuss Machlup’s ideas on liquidity creation. In the main, however, I do not discuss the 1960s literature on liquidity creation. To provide a frame of comparison, I also describe Friedman’s main arguments for freely-flexible rates, and against, fixed rates. As I show, occasional collaboration on the exchange-rate-regime issue among Fellner, Friedman, Haberler, and Machlup in the 1960s led to shifting positions, with Fellner and Machlup (on one occasion) joining Friedman in advocating free floating, and with Friedman (on one occasion) joining the three members of the Quartet in advocating a modified (no mandatory intervention at the band limits) crawling peg arrangement. With Triffin having consistently been a proponent of fixed exchange rates throughout the Bretton Woods period, and with his views on the international monetary system having recently been thoroughly (and cogently) discussed by Ivo Maes with Ilaria Pasotti (2021) in *Robert Triffin: A Life*, I only briefly discuss his arguments for rejecting flexible exchange rates -- a subject not covered by Maes with Pasotti.

[7] Comparisons of alternative exchange rate systems, including the crawling peg and floating, are provided in Tavlas, Dellas, and Stockman (2008), Klein and Shambaugh (2010), and Gagnon with Hinterschweiger (2011).

My narrative is split into three periods: mid-1940s to mid-1950s, late-1950s to mid-1960s, and late-1960s to early-1970s. For each of the periods, I provide a brief historical context, followed by a doctrinal discussion of the views of members of the Quartet. As I show, each of those periods corresponds to different sets of problems confronting the international monetary system. My data sample includes journal articles, newspaper articles, letters-to-the-editor, personal correspondence, interventions at a professional conference, and congressional testimonies. The output on international monetary reform by the economists under consideration in this study was prolific during the Bretton Woods years, and, hence, any narrative of their output cannot possibly capture it all. My aim is to provide sufficient coverage to accurately capture the views of members of the Quartet on exchange-rate regimes. Correspondingly, the narrative of the evolving positions of the members of the Quartet on the exchange rate system provides a window through which the evolving position towards increased exchange rate flexibility of the profession at large can be better understood. Appendix A provides bios of the Quartet members.

2. Preconvertibility, mid-1940s to mid-1950s

2.1 Historical Context

The system that was agreed at Bretton Woods, New Hampshire, in July 1944, sought to avoid the exchange-rate instability that characterized the floating rate regime of the first half of the 1920s, which was thought to have impeded external adjustment and the post-World War I reconstruction of trade and investment. The view that floating exchange rates discourage trade and investment, and impede external adjustment, reflected the influence of Ragnar Nurkse's (1944) report, *International Currency Experience*, for the League of Nations. Drawing primarily on the experience of the floatation of the French franc from 1922 to 1926, Nurkse (1944: 137) argued, "If there is anything that inter-war experience has clearly demonstrated, it is that paper currency exchanges cannot be left to fluctuate from day to day under the influence of market supply and demand." Nurkse (1944: 138) interpreted the inter-war experience as having shown that floating currencies encourage destabilizing speculation "in the widest sense

[that] is likely to play havoc with exchange rates."[8] Nurkse also argued that exchange rate changes under floating rates might not be effective in restoring trade balance because the elasticities of trade with respect to exchange-rate changes were low -- a notion that became known as "elasticity pessimism" (Caves, Frankel, and Jones 2003: 305). Nurkse stated: "in certain circumstances [*e.g.*, "if a country's demand for imports is highly inelastic"] a fall in the exchange will not lead to an equilibrating adjustment in the balance of trade. Study of the facts has not infrequently failed to support the simple view that exchange depreciation improves the balance of trade" (1944: 119).

Under the Bretton Woods agreement, each member of the IMF was required to establish a par value for its currency in terms of either gold or the US dollar and to maintain the market exchange rate of its currency within one per cent of the declared par value, by intervening in the foreign-exchange market by buying and selling the currencies of other countries: the United States pegged the price of the dollar at $35 per ounce of gold, where it had been since 1934. Until the late-1950s, the $35 per ounce price of gold was considered to be inviolable: a one-time change, it was thought, would give rise to expectations of further changes, undermining the stability of the system. Parities of other currencies against the dollar could be changed with Fund approval if a member faced a 'fundamental disequilibrium' on its external accounts. The term "fundamental equilibrium" was never defined. The Fund could not disapprove a change in parity, however, if the change was less than 10 per cent (Bordo 1993: 35). Moreover, each member of the Fund was expected to make its currency convertible for current-account transactions. Convertibility meant that nonresidents who received a country's currency were permitted by the country's government to convert that currency into any other currency at exchange rates within the official margins, and that the United States was willing to buy gold from, and sell gold to, its official foreign creditors in order to maintain the fixed price of $35 per ounce (within the one percent margin) (Solomon 1977: 24; Bordo 1993: 38). Although the U.S. dollar was convertible through most of the Bretton Woods period, convertibility of the currencies of the Western European countries on current-account transactions was not established until the end of 1958.

[8] For discussions of Nurkse's views on exchange rate regimes, see Bordo and James (2001), Eichengreen (2018), and Tavlas (2025b).

Discussions on international economics in the fifteen years following the end of World Wat II were dominated by the controversy over the dollar shortage.[9] In brief, the dollar-shortage problem comprised two inter-related issues. First, apart from gold, the supply of which was inelastic, the dollar was the predominant reserve asset used by central banks in the 1930s and 1940s, but the supply of dollars internationally was not keeping pace with demand. Consequently, the limited supply of global liquidity was thought to have imparted a deflationary bias to global growth (part of the Triffin dilemma). Second, the United States was at the same time accumulating a rising share of the global gold monetary stock. The U.S. share of the global monetary gold stock rose from about one-half in the late 1930s to three-fourths at the end of World War II (Dellas and Tavlas 2025). The gold and dollar reserves of the war-ravaged European countries were depleted. Europe ran large current-account deficits during and after the war, reflecting the demand for essential imports and the reduced capacity of the region's export industries (Bordo 1993: 38-39). The main problem facing these countries was to acquire dollar reserves to finance purchases of needed imports from the United States. Consequently, many European countries chose to ration foreign exchange after the war to restrain spending on non-essential imports (Irwin 2019: 67).

2.2 Haberler, Friedman, and Machlup

Haberler, 1945. Following the 1944 agreement to establish the Bretton Woods system, Haberler was a proponent of fixed-but-adjustable exchange rates. In a 1945 paper, "The Choice of Exchange Rates after the War," published in the *American Economic Review*, Haberler focused on methods that could be used to determine a country's post-war equilibrium exchange rate, which he defined as "the rate which equilibrates the balance of payments" (1945: 313). Haberler assumed "that in most countries more or less stringent controls of the foreign exchange market will have to be maintained for some time after the war" (1945: 308). To determine the equilibrium exchange rate for a currency, he expressed the view that the authorities should be guided by purchasing-power-parity, which, though subject to "reservations and limitations," "has a certain relevance and usefulness, even under a regime of direct controls" (1945: 315-16).

[9] In his textbook, *Economics: An Introductory Analysis*, Samuelson (1958: 707) called the dollar shortage "the big open question of our time."

What about the possibility of using floating exchange rates to determine the equilibrium rate? Haberler argued that "it is certain that a system of 'free exchanges' would lead to extremely undesirable results" (1945: 309). Basing his case against floating exchange rates on Nurkse's (1944) assessment of the French franc experience with floating in the early-1920s, Haberler (1945: 309) asserted that floating "would incite capital flight and violent fluctuations." He believed that floating exchange rates would fare even worse in the 1940s than they had in the 1920s "because people everywhere are much more inflation-conscious than they were in 1919, and, hence, speculative reactions would be very quick" (1945: 309). Haberler concluded his discussion of floating exchange rates as follows: "The upshot of this whole discussion is that a system of freely fluctuating exchanges is hardly acceptable. Occasional adjustments at irregular intervals is all that can be recommended to assure flexibility" (1945: 311).

Haberler, Machlup, and Friedman, 1948. In April 1948, a conference on Monetary Policy for a Competitive Order was held at the University of Chicago in which Friedman, Haberler and Machlup participated. Other participants included Lloyd Mints, and Aaron Director, from Chicago, and Frank Graham (Princeton University), Friedrich Hayek (LSE), and Abba Lerner (Roosevelt University). The exchanges that took place provide information about the views of Haberler, Machlup, and Friedman on the exchange-rate-regime issue at the time of the conference. To my knowledge, the conference proceedings have not been previously cited in the literature.[10]

The first two sessions, both held on 1 April, were dedicated to the exchange-rate issue. Haberler led the discussion on the case for the Bretton Woods adjustable peg regime. As he had argued in his 1945 article, Haberler asserted that speculation under floating rates would be destabilizing. He argued that speculative capital movements would undermine the viability of flexible exchange rates: "there is no case in which free exchange rates worked" (Monetary Policy for a Competitive Order 1948: 2). He also argued: "Completely free exchange rates are not desirable. Empirical studies have shown that they have never worked. The only feasible alternative system is one of fixed

[10] The following account of exchanges that took place at the conference are from transcriptions of the discussions located (incorrectly) in the Mont Pelerin Society papers in the Hoover Institution Archives and Library. Credit for the discovery of the transcriptions belongs to Doug Irwin, who attached a note (dated December 2013) that reads as follows to the transcriptions: "This document is *not* from the Mont Pelerin Society – it is from the Free Market Study conference at the University of Chicago in 1948" (italics in original).

exchange rates with provision for occasional discontinuous change" (1948: 3). What circumstance would give rise for such a "discontinuous change"? Haberler thought that differences in cyclical positions between countries would be a determining factor:

> if one country wishes to avoid deflation, consequent on deflation in another country, it will be necessary for that country to allow its currency to depreciate. It is necessary to make the realistic assumption that there will continue to be rather sharp cyclical fluctuations which will have different effects in different countries. It is also probable that the anti-cyclical policies of different countries will conflict with each other. Consequently some provision must be made for the various countries who wish to do so to depreciate their currencies (1948: 3).

Machlup agreed that speculation in the foreign exchange market under floating rates would be destabilizing. Comparing the effect of speculation in commodity markets with its effect in foreign exchange, he argued that speculators in commodity markets incurred costs, which limited the extent of speculation in those markets.[11] In contrast, "Speculation in exchange rates is free of such costs. It is, therefore, easy to envisage pronounced movements of exchange rates [under floating rates]" (1948: 2). Thus, he concluded that floating exchange rates would be subject to volatility: "In the world as it is, it is not possible to have foreign exchange stability [under flexible exchange rates]" (1948: 3).

Friedman criticized Haberler's depiction of the working of the adjustable peg. In particular, Friedman argued that policies aimed at countering a cyclical downturn under fixed exchange rates would lead to a loss of reserves and magnify the level of exchange-rate adjustment that would ultimately be required. Friedman stated:

> Haberler has the worst of both worlds. During periods between exchange rate changes the government cannot follow an anti-cyclical policy which means that there may be cumulative change of the gold stock. This would tend to encourage rather than discourage speculation in exchange rates because speculators would have fairly clear indication when a shift of exchange rates was impending. Furthermore, if the government attempted to take counter-cyclical action, given stable exchange rates, it would tend to magnify the adjustment eventually required (1948: 3).

Friedman advocated flexible exchange rates based on the following arguments. (1) The costs of uncertainty due to exchange-rate volatility would not be so high as to impede international trade "given a well developed [forward] exchange market which

[11] Machlup did not specify the form of costs. He may have had in mind the costs of holding inventories.

makes hedging both possible and cheap" (1948: 4). (2) Speculation under flexible exchange rates is destabilizing only if the economic fundamentals are unstable: "To assume speculative movements in exchange rates is to assume international instability. If, therefore, exchange rates are unstable [under flexible rates] a gold standard [fixed rates] will also be unsatisfactory" (1948: 2). (3) Government officials are likely to set the incorrect rate under fixed rates, with damaging results: "Government officials are not free of speculative tendencies, and when their speculative hunches are incorrect the result is far more damaging than the result of an error by a private speculator" (1948: 4). (4) The adjustable peg regime provokes speculative attacks "because speculators would have fairly clear indication when a shift of exchange rates was impending" (1948: 3).

Haberler, 1953. Haberler's paper, "Reflections of the Future of the Bretton Woods System," marked a shift from his previous position on the Bretton Woods adjustable peg system. The paper was delivered at the Annual Meeting of the American Economic Association held on 27-29 December 1952, and published in the May 1953 issue of the *American Economic Review*.

Haberler began by noting that "Many experts would ... agree that the [Bretton Woods system] was up to now a dismal failure" (1953: 81). It had been marked, he argued, by persistent balance-of-payments difficulties, the dollar shortage, and the recurrence of acute crises. Moreover, qualitative trade restrictions had not been reduced, convertibility of currencies (other than the dollar) had not been established, and exchange controls had not been abolished (1953: 81). To turn the situation around, Haberler argued that a first step would be the restoration of convertibility. But how could convertibility be implemented? Haberler stated: "there is no magic formulae ... which could carry us easily and painlessly to convertibility. The basic prescription is this: let exchange rates find their equilibrium level, avoid inflation, and apply disinflationary policies" (1953: 84). Haberler, however, did not believe that such "a radical solution" -- what he called a "dash towards convertibility" -- had any chance of being adopted because flexible exchange rates were in violation of the IMF Articles of Agreement. Therefore, he called for a "more gradual approach" under which convertibility would be restored for current-account transactions, but not for the capital account (1953: 84-85).

Why had the Bretton Woods system been a failure? Haberler attributed the failure to two factors. First, the architects of the system "paid much too little attention to the problem of inflation"; in particular, "they were preoccupied ... with deflation rather than inflation, with competitive depreciation rather than with overvaluation and reluctance to adjust the exchange rate" (1953: 87). To deal with the latter problem, Haberler called for the IMF to be involved "more intensely with the internal economic and financial policies" of its members (1953: 87). Second, the architects adopted a "rigid attitude with respect to exchange rates" (1953: 88). Underlying that "rigid attitude" was an adherence to elasticity pessimism: exchange rate changes were thought to be ineffective in restoring equilibrium in the balance of payments. Haberler had earlier been critical of that view. In a 1947 commentary on a paper by Triffin (1947), Haberler referred to "the now fashionable assumption that the elasticities of international demand are often such that a depreciation cannot always be expected to improve the balance of payments." He continued: "I do not think that this is a realistic theory barring perhaps short-run considerations of a few exceptional cases."[12] Subsequently, in 1949 Britain and thirty other countries devalued their currencies against the dollar, leading to substantial improvements in their balance of payments (see below). The success of those devaluations reduced the pervasiveness of elasticity pessimism within the profession. In his 1953 paper, Haberler wrote: "There is less 'elasticity pessimism' today than there was a few years ago although it has by no means disappeared entirely.... Many writers have adopted a more optimistic attitude [about the effectiveness of exchange rate changes], to which I completely subscribe" (1953: 86).[13] To address the "rigid attitude" toward exchange rates, Haberler advised that the IMF Articles of

[12] See, also, Haberler (1944: 180, fn. 14). In their 1947 papers, Haberler and Triffin discussed the conditions needed to determine whether a country faced a fundamental disequilibrium. Haberler argued that the disequilibrium had to show-up in a country's balance-of-payments statistics, whereas Triffin thought that "there may exist a fundamental disequilibrium in a country's economy, even in the absence of any actual balance of payments deficit" (Triffin 1947: 77). Given a fundamental disequilibrium, both economists advocated exchange-rate adjustment. Triffin's paper is notable because, he argued, perhaps for the first time, that successful international adjustment "requires a high level of international reserves" (Triffin 1947: 80). This stress on reserves would orient Triffin's policy agenda for the remainder of his career. Triffin's 1947 paper was originally published in 1946 (see Triffin 1946).

[13] In a 1949 article, "The Market for Foreign Exchange and the Stability of the Balance of Payments: A Theoretical Analysis," Haberler specified the theoretical conditions, in terms of the demand and supply curves of foreign currency and the elasticities of demand and supply for a country's exports and imports, under which an exchange rate depreciation would improve the balance of payments. Haberler (1949: 210) concluded that the conditions under which the demand for a country's exports "being not sufficiently elastic is greatest in the case of highly specialized countries which have a near-monopoly in their principle export goods and are unable to substitute easily and to a large extent home produced goods for imports."

Agreement should be revised "to make it permissible for a country to adopt a system of freely fluctuating exchanges without being cut off from support from the Fund" (1953: 88).

Friedman, 1953. Friedman's essay, "The Case for Flexible Exchange Rates," was his second foray into the area of international monetary economics.[14] It would turn out to be his most influential. At forty-seven pages in length, it provided comprehensive assessments of the three major types of exchange rate systems: freely flexible rates, the adjustable peg (as under the Bretton Woods system), and fixed exchange rates (as under the gold standard).[15]

Friedman argued that flexible rates would remove the balance-of-payments constraint on policymakers and, thus, provide autonomy for national monetary and fiscal policies (1953: 200). He expanded on several of the arguments to which he had referred at the 1948 Chicago conference.

- *Exchange-rate uncertainty and trade performance*. Friedman argued that, under flexible exchange rates, traders can protect themselves in futures markets in foreign currency, which inevitably develop under flexible exchange rates. Thus, any uncertainty will be borne by speculators (1953: 174). In contrast, under fixed exchange rates controls on trade would restrict the amount of trade, Friedman (1953: 197) asserted: "The only other alternative to movements in exchange rates is direct control of foreign trade. Such control is therefore almost certain to be the primary technique adopted to meet substantial movements in conditions of international trade so long as exchange rates are maintained rigid."
- *Destabilizing speculation*. Regarding the Bretton Woods adjustable peg, Friedman (1953: 164) predicted its demise. He stated: "this system practically insures a maximum of destabilizing speculation. Because the exchange rate is changed infrequently and only to meet substantial difficulties, a change tends to come well after the onset of difficulty, to be postponed as long as possible, and to be made only after substantial pressure on the exchange rates has

[14] In 1951, Friedman published "Commodity-Reserve Currency" which assessed an international monetary arrangement under which a currency's value would be tied to a basket of physical commodities, and not just a single commodity as under the gold standard.

[15] The paper was a revision of a 1950 memorandum that Friedman wrote as a consultant in Paris to the U.S. governmental agency, Finance and Trade Division of the Office of Special Representative for Europe. Subsequently, the paper went through several re-drafts, which have been preserved in the Milton Friedman collection at the Hoover Institution's Library and Archives.

accumulated. In consequence, there is seldom any doubt about the direction in which an exchange rate will be changed." In contrast, under flexible rates, Friedman maintained that speculation in the foreign exchange market would be stabilizing because speculators who engage in destabilizing speculation would lose money "since speculation can be destabilizing in general only if speculators on the average sell when the currency is low in price and buy when it is high" (1953: 175). He was sharply critical of Nurkse's interpretation of the interwar experience: "It is a sorry reflection on the scientific basis for generally held economic beliefs that Nurkse's analysis is so often cited in the 'basis' or 'proof' of the belief in destabilizing speculation" (1953: 176). Friedman noted that Nurkse's thesis rested on the experience of the French franc from 1922 to 1926. Friedman argued that, in retrospect, "it is clear that the speculators were 'right'."

- *Discipline*. Friedman argued that floating rates impose discipline on macroeconomic policies since exchange rate changes happen immediately and are very visible. Thus, in contrast to fixed rates, under which changes in the exchange rate take place infrequently and changes in reserves are observed with a lag, under flexible rates "the deterioration in the foreign-payments position shows up promptly in the more readily understandable and simpler form of a decline in the exchange rates, and there is no emergency, no suddenly discovered decline in monetary reserves to dangerous levels, to force the imposition of supposedly unavoidable direct controls" (Friedman 1953: 179).

Haberler, 1954. The study that established Haberler's reputation as an early advocate of floating exchange rates was his 1954 monograph *Currency Convertibility*.[16] As mentioned, Western European currencies were inconvertible – both for current account and capital account transactions – until the end of 1958, at which time they became convertible for current account transactions.[17] Earlier, in July 1947, the United Kingdom tried to restore current account convertibility as part of an agreement under which that country received loans of $3.75 billion from the U.S. and $1.25 billion from Canada. The restoration of convertibility, however, led to a run on sterling and a

[16] de Vries (1985: 101) called the *Currency Convertibility* one of three "classic articles advocating flexible rates" during the Bretton Woods period. The other two articles, according to de Vries, were Friedman (1953) and Meade (1955).

[17] In December 1958 the German mark was made convertible for both current account and capital account transactions.

depletion of the U.K.'s reserves by $1 billion within a month. Consequently, convertibility was suspended on 20 August 1947 (Bordo 1993: 43-44).

Haberler argued that convertibility would provide innumerable benefits to the global economy:

> The first and basic advantage of freely convertible currencies for the world at large is that it enables producers and consumers everywhere to buy from the cheapest sources and sell at the highest prices, i.e., where the need for each commodity is most urgent. As a consequence every country and region can specialize on those lines of production where it has the greatest comparative efficiency and can import those commodities which other countries can in turn produce more efficiently. Convertibility is thus an indispensable condition for the attainment of maximum world output (Haberler 1954: 12).

But why had the attempt by the U.K. in 1947 to restore convertibility been what Haberler called "a colossal failure" (1954: 16)? The answer, according to Haberler, was that the U.K.'s high post-war inflation had rendered the pound sterling "hopelessly over-valued." He argued: "this made convertibility unworkable, at least without drastic devaluation of the pound (1954: 17). And this analysis of the failure in 1947 to restore convertibility contributed to a change in Haberler's view about the exchange-rate-regime issue. Haberler wrote: "The restoration of convertibility may require changes in the relative values of some currencies – changes which cannot possibly be figured out beforehand. Hence, it may be necessary to set exchange rates free, *at least for some time*, so that market forces of demand and supply can determine the equilibrium [exchange] rate pattern" (italics supplied, 1954: 6). Haberler (italics supplied, 1954: 23-24) also argued that "it would seem unwise to restore convertibility without providing flexibility of exchange rates, *at least until equilibrium of the rates under convertibility has been found*."

Thus, whereas Haberler had been, like most of the economics profession, a proponent of the Bretton Woods adjustable peg regime in the mid and late 1940s, by the years 1953 and 1954 his view had undergone a marked change. In his 1954 monograph, he identified two sets of factors that led to the change: (1) the problem that he saw in the working of the adjustable peg and (2) the advantages that he had come to identify with flexible exchange rates. Regarding the first factor, Haberler came to believe that government officials set the wrong exchange rate, an argument that Friedman had made at the 1948 Chicago conference in which Haberler had participated:

> This system of 'the adjustable peg' ... has worked in an unsatisfactory and, in fact, unstabilizing fashion. Nobody can calculate with precision beforehand how large a devaluation will be sufficient to maintain equilibrium under Convertibility. In consequence each government in order to be on the safe side and to avoid the embarrassment of having to repeat the operation, will tend to devalue too much rather than too little. Therefore the method of the "adjustable peg" does not provide the necessary flexibility (1954: 24).

Regarding the advantages of flexible exchange rates, Haberler again employed arguments made by Friedman both at the 1948 conference and in his 1953 essay on flexible exchange rates, although Haberler did not refer to Friedman's views. Reversing the position that he had taken in the 1940s, he argued that the adjustable peg invites one-way bets: "If the currency is pegged, the risk of speculating against it is almost entirely removed, because the speculator can be virtually certain that the value of the currency will not go up" (1954: 25). In contrast, "under the floating exchange regime" the "risk that a currency may go up is ever present ... which tends ... to put a check on adverse speculation" (1954: 25). Moreover, as Friedman had argued both at the 1948 Chicago conference and in his 1953 essay, Haberler affirmed that any risk due to floating rates "can be substantially reduced by permitting and organizing well functioning forward markets in foreign exchanges" (1954: 26). Finally, as Friedman (1953) had also argued, Haberler (1954) asserted that, compared with the adjustable peg, floating "enforces a certain measure of discipline on Governments and Central Banks" (1954: 26).

2.3 Friedman, 1953 vs. Haberler, 1954

In terms of the comprehensiveness of the respective cases made for flexible exchange rates, the studies by Friedman (1953) and Haberler (1954) were markedly different. As mentioned, Friedman's essay was forty-seven pages in length. It provided a detailed assessment of the cases for and against flexible, fixed-but-adjustable, and permanently fixed exchange-rate regimes. It anticipated subsequent work on optimum currency areas, developed by Mundell (1961), and exchange rate overshooting developed by Dornbusch (1976).[18] In contrast, Haberler's argument for floating rates was an incidental part of a study on convertibility – a subject that need not be related to the issue of exchange-rate regimes. Haberler's monograph totaled forty-seven pages in length, but only *three* of those pages (24-26) dealt with the issue of exchange rates.

[18] For a discussion, see Dellas and Tavlas (2009).

Moreover, each of the arguments (discussed above) that Haberler made in support of flexible exchange rates, and against the adjustable peg, had previously been made (in more depth) by Friedman. Finally, Haberler qualified his support for flexible exchange rates. As noted, he believed that they could be useful until an equilibrium exchange rate had been determined.

Two issues arise. First, why did Haberler's study gain a stature among some writers, including by de Vries (1986) in an official IMF history of the international monetary system, on a par with that of Friedman's essay? The answer likely reflects the fact that in the early 1950s Haberler, unlike Friedman, had established a reputation as an eminent scholar in the field of international economics. The fact that, as an early proponent of the adjustable peg, he had switched to favor flexible rates most certainly caused others to take notice. In contrast, Friedman was, by-and-large, a novice in international economics. His 1953 essay was among his first two substantive works in that field.[19] The essay was published in a book of essays written by Friedman, each of which, with the exception of the article on exchange rates, had been previously published. Both the publication outlet, which provided less visibility than a publication in a top journal, and the fact that Friedman had not previously published extensively in the area of international economics, likely contributed to a delay in professional recognition of the essay. Thus, Haberler's views on exchange rates carried more professional weight than Friedman's in the first half of the 1950s.

The second issue concerns the possible role that Friedman's views may have played in influencing Haberler's conversion to flexible exchange rates. There is evidence that the influence was considerable. As documented, Haberler had been exposed to Friedman's views on exchange rates at the 1948 Chicago conference. Moreover, it is also relevant that the two economists had been corresponding around the time that Haberler had been writing his 1954 monograph on convertibility. This circumstance is evident in a letter, dated 3 February, 1953, from Friedman to Haberler, in which Friedman commented on Haberler's 1953 *AER* paper on Bretton Woods. Friedman wrote: "I have just finished reading your paper on Bretton Woods ... and I cannot resist writing you immediately to congratulate you on it." Friedman continued: "As far as I

[19] However, in the early-1950s Friedman had become a rising star in the profession for his theoretically-oriented work on utility. On the basis of his work in that field, in 1951 he won the John Bates Clark Medal, the award given by the American Economic Association to economists under forty for an outstanding contribution to economic research. See Nelson (2020, Vol. 1: 176-77).

can see, the only difference in policy position between us is that I am rather more extreme and less tolerant than you – I would favor the ‘dash toward convertibility’ with freely fluctuating exchange rates, no international stabilizing fund, abolition or rendering innocuous of the IMF.” Haberler replied to Friedman in a letter dated 9 February 1953. In his letter, Haberler did not address the exchange rate issue, but he expressed disagreement with Friedman on the latter’s view of the IMF: “you are too critical of the IMF. I think they are becoming quite reasonable and the institution may still play a useful role.” Nevertheless, Haberler’s 1954 monograph, *Currency Convertibility*, contained only two references to the IMF (on pages 20 and 21). Unlike his 1953 paper on Bretton Woods, neither reference mentioned an enhanced role for that institution.

We, thus, have the following facts. (1) Haberler had been exposed to Friedman’s views on exchange rates at the 1948 Chicago conference. (2) Friedman and Haberler had been corresponding on the international monetary system in 1953, the year in which Friedman published his essay on exchange rates, leaving open a possibility that Haberler may had been aware of that essay during the time when he had been working on his 1954 monograph. (3) Friedman (1953) was pretty much on his own in advocating flexible exchange rates in the early-1950s. To the extent that Haberler’s shift in favor of flexible rates had been influenced by what others had written, there was very little available in print during those years that could have influenced Haberler other than Friedman’s essay.[20] (4) The arguments made by Haberler on the exchange-rate-regime issue in his 1954 paper had *all* been made previously by Friedman. In light of these circumstances, it is reasonable to conjecture that Friedman’s arguments in favor of flexible exchange rates influenced Haberler’s conversion to flexible rates. As we shall see, Haberler’s position in favor of flexible exchange rates would be less enduring than Friedman’s.

[20] Dornbusch and Krugman (1976: 537) stated: “The literature on flexible exchange rates goes back to Milton Friedman, ‘The Case for Flexible Exchange Rates.’” In a 1969 debate with Friedman, Samuelson stated: “I would like to pay a personal tribute to Milton Friedman. He was a lone voice crying in the wilderness 10 or 15 years ago in favor of flexibility in exchange rates” (quoted from Nelson, 2020, vol. 2, 293). Friedman’s Chicago colleague, Lloyd Mints, published a book, *Monetary Policy for a Competitive Society* in 1950, which contained a chapter “Fixed versus Flexible Exchange Rates.” As pointed out by Edwards (2023) and Tavlas (2023, chap. 6), the chapter enumerates several of Friedman’s (1953) arguments. However, the book did not make much of a professional impact. In addition, Frank Graham (Princeton University) published several studies in the 1940s in favor of flexible exchange rates, but Graham retired in 1945 and died in 1949.

3. Convertibility, late-1950s to mid-1960s

3.1 Historical Context

In the late-1940s and the 1950s, three developments helped alleviate the scarcity of dollars. First, the Marshall Plan (1948-52) transferred \$13.3 billion in economic recovery programs (grants and loans) to Western European economies – about 3 percent of the national incomes of the recipient countries. The recipient countries were permitted to export to the United States while restricting their imports from the United States (Meltzer 1991: 58). The Marshall Plan allowed European counties to purchase capital goods and raw materials needed to start up their industries, thus helping to directly relieve the dollar shortage (Kenen 1994: 492). Second, in September 1949, the pound sterling was devalued by 30.5 percent against the dollar. Thirty other countries followed the British move within two weeks with devaluations ranging from 8 percent (Italy) to 53 percent (Austria) (Eichengreen 2007a: 77). The devaluations helped improve the competitiveness of these countries against the United States. Both the Marshall Plan and the devaluations provided temporary relief to the dollar shortage.

The third development was the closing of the productivity gap between Continental European economies and the United States, which provided a structural solution to the dollar shortage. In the 1950s, productivity rose at an estimated average annual rate of 2.4 percent in the United States. In Continental Europe, productivity increased by an estimated annual average rate of 3.9 percent in France, 6 percent in Germany, 4.1 percent in Italy, 4.2 percent in Switzerland, and 3.7 percent in the Netherlands (Solomon 1977: 21). In 1959 Charles Kindleberger, who had written extensively on the dollar shortage throughout the 1940s and 1950s, declared that the dollar shortage had ended. He stated: "A considerable part of the so-called dollar shortage seems to have been due to continuous innovation on the part of American industry ... This technological gap is no longer so one-sidedly in favor of the United States" (Kindleberger 1959: 956).

But a new problem had arisen. In 1958, the United States began running deficits on the current account. Although the country's current-account swung back into surpluses throughout the first half of the 1960s, these surpluses were outstripped by capital outflows from the United States (Kenen 1994: 494-95, Table 19.1). As a result, foreign central banks' holdings of dollars rose in relation to U.S. official holdings of gold

(Caves, Frankel, and Jones 2003: 396). With the supply of dollar reserves outstripping U.S. official holdings of gold, concerns emerged whether the United States would be able to fulfill its commitments to convert dollars held by the foreign official sector into gold at the prevailing $35 price. In his study, *The International Monetary System, 1945-1976,* Robert Solomon (1977: 37) put the situation as follows: "And while the U.S. gold stock had declined $1.7 billion in the years 1950-1957, it fell $5.1 billion in the three years 1958-1960. A 'run on the bank' was not an impossible eventuality."

A first glimpse of a confidence crisis came in the fall of 1960. In October, speculators pushed the price of gold on the London market up to $40.00. In its 1 October 1960, issue, *The Economist* broached the issue of the $35 price of gold. It discussed the pros and cons of a devaluation of the dollar against gold; the cons were found to outweigh the pros (*The Economist* 1960). Meanwhile, the United States and seven foreign central banks formed the London Gold Pool, under which they agreed to buy or sell gold in order to peg the price at $35.00 per ounce, to stabilize the London (private market) gold price (Bordo 1993: 68-69; Eichengreen 2007b, chap. 1). Although the gold price returned to $35.00 per ounce after the "gold rush" of the fall of 1960, as Leland Yeager (1976: 426) noted, "the former extreme confidence in the dollar never returned."

What followed was a series of meetings, conferences, and reports during the next fifteen years on the problems posed by the reliance of the international monetary system on the U.S. dollar as the primary reserve currency and possible alternatives to the dollar. Many of the meetings and conferences involved representatives -- both from the official and academic sectors -- tasked with finding ways to reduce the U.S. balance-of-payments deficit. Solomon (1977, chap. 3 and chap. 4) discussed the following initiatives during the first half of the 1960s.

- In January 1961, U.S. President John F. Kennedy commissioned a bipartisan study of ways to expand the U.S. economy while correcting the balance of payments deficit.

- In 1963, the Brookings Institution published a study undertaken for the U.S. Government on the outlook for the U.S. balance of payments through 1968. The outlook was judged -- incorrectly, it would turn out -- to be favorable.[21]
- In October 1963, the Finance Ministers and Central Bank Governors of the G10 countries requested their deputies to undertake a thorough examination of the outlook for the functioning of the international monetary system and its probable future needs for liquidity. The G10 deputies met monthly from October 1963 to June 1964. The deputies' report, published in August 1964, stressed the need for a new reserve asset to supplement the dollar.
- The deputies proceeded to establish a new group -- the Study Group on the Creation of Reserve Assets. That group's report, completed in May 1965, proposed several ways to supplement the dollar, including the creation of new assets or drawing rights in the IMF -- a proposal that led to the IMF's Special Drawing Rights (SDRs). The deputies also proposed that the OECD's Working Party No. 3 undertake a study of how balance-of-payments dis-equilibrium could be more quickly corrected and, once corrected, better preserved.
- The deputies further recommended the establishment of a system of "multilateral surveillance" of "the various elements in international liquidity -- whether of a private or official character -- available or created for the financing of surpluses and deficits." The G10 countries would provide the BIS with statistical data on the means used to finance surpluses and deficits. The data would be subjected to "a full exchange of views" in the OECD's Working Party No. 3 (quoted from Solomon 1977: 68).
- From 1960, successive U.S. administrations retained or strengthened controls on trade and payments aimed at reducing the U.S. balance of payments deficit, including a reduction in long term U.S. investment abroad.[22] Among the measures: a reduction in overseas military expenditures (1961), tying of development aid to dollar purchases by foreign borrowers in U.S. markets

[21] The study projected that by 1968 the "basic balance" -- balance on goods and services, government payments plus long term capital flow -- would be between a deficit of $600 million and a surplus of $1.9 billion, depending on growth, prices, and costs at home and abroad. The projections of the Brookings study were highlighted in the 1964 *Economic Report of the President* (1964: 130-31). The recorded 1967 basic balance was a deficit of $2.1 billion. See Meltzer (1991:63).

[22] Measures to reduce long-term U.S. investment abroad were inconsistent with economic analysis since the investment, if profitable, would have been expected to yield future inflows.

(1961), an interest equalization tax of one percent on purchases of foreign securities (1963), limits on growth of bank loans to foreigners (1965) (Meltzer 1991: 62, Table 1).

- In July 1965, U.S. Secretary of the Treasury, Henry Fowler, "electrified the world ... by announcing that the President [Lyndon Johnson] had authorized him to say that 'the United States now stands prepared to attend and participate in an international monetary conference that would consider what steps we might jointly take to secure substantial improvements in international monetary arrangements'" (Solomon 1977: 81-82).
- The IMF's *Annual Reports* for 1964 and 1965 discussed ways for countries to pursue expansionary monetary policies while at the same time implementing reform measures to correct payments imbalances. The 1964 report provided a wide menu of policies (including greater flexibility of fiscal policy so that monetary policy could pay more attention to capital flows) in which countries could address external adjustment. As for exchange rate adjustment, the report stated that it was permitted in the IMF's articles "but such situations should arise less frequently to the extent that the policies described above are followed" (IMF 1964: 28). The 1965 report listed a series of measures that could be used to adjust a country's balance of payments (either surplus or deficit). Exchange rate changes were the last policy instrument on the list (IMF 1965: 9-12).

Solomon (1977: 58) summarized the prevailing view about reform in official circles as follows: "While interest and concern were constantly expressed in the first half of the 1960's regarding the need for avoiding and correcting persistent payments imbalances, remarkably little attention was given to the exchange rate." In its 1964 *Economic Report to the President*, the U.S. Council of Economic Advisers (CEA) argued that although the Bretton Woods agreement permitted exchange rate adjustments, "for a reserve currency country, this alternative is not available" (CEA 1964: 139). The reason? The *Report* argued that the United States, as the provider of short-term claims denominated in dollars, "acts in effect as a banker to other countries." Hence, "the viability of the present reserve currency system depends on the confidence of foreign holders, both official and private, that their dollar claims will not lose value" (1964: 136). The *Report* discussed a number of ways for "strengthening" the system, including "flexible changes in the mix of fiscal and monetary policies ... to reconcile internal and external policy goals" (1964: 143), and proposals that had been put forward for "improving the mechanism for generating reserves" (1964: 145). The *Report* did not discuss the possible use of exchange-rate adjustments. I now turn to the views on exchange rates in the early- and mid-1960s of the members of the Quartet and of Friedman. As we shall see, at the beginning of this period the Quartet considered individual components of what would become the crawling peg regime; by the end of the period, they would advocate that regime in its entirety.

3.2 The Quartet and Friedman, early-1960s

Triffin, 1960, 1962. In his 1960 book, *Gold and the Dollar Crisis,* Triffin described the two "inescapable" problems under the Bretton Woods system as follows.[23] "The first is that the elimination of our [*i.e.,* the U.S.] balance of payments deficit would, by definition ... deprive thereby the rest of the world of the major source by far ... from which the international liquidity requirements of an expanding world economy have been met in recent years, in the face of a totally inadequate supply of gold" (1960: 9). He continued: "the second is that the huge legacy of short term foreign indebtedness already inherited by us from the past is likely to place a heavy handicap on sound policies for economic growth and stability in this country" (1960: 9). If the dollar reserves of other countries continued to rise, it was "bound to undermine ... the international liquidity position of the currencies used as reserves by other countries and, by way of consequence, to impact an increasing vulnerability to the world monetary superstructure" (1960: 8-9). Triffin characterized these two sets of problems a "double dilemma" (1960: 10). He spent the rest of his career devising and refining plans for reform of the international monetary system (Maes with Pasotti 2021: 139).

Triffin was an ardent critic of flexible exchange rates.[24] In *Gold and the Dollar Crisis*, he wrote of freely fluctuating exchange rates, along with proposals for an upward revaluation of the price of gold, as follows: "Before venturing new and constructive suggestions [for international monetary reform] ... it is necessary to clear the air of two plausible, but illusory, solutions to the more immediate difficulties that may spring up within the next two or three years from the impending shortage of

[23] Maes with Pasotti (2021: 123) wrote that *Gold and the Dollar Crisis* was "the book that made him [Triffin] famous."
[24] As we shall see, after the move to flexible exchange rates in the 1970s, Triffin was unyielding and bitter in his intellectual battle against Friedman and flexible rates.

international reserves and liquidity." After noting that an upward valuation in the price of gold "finds very little audience in academic circles," he dismissed flexible exchange rates as "the miracle drug that will make international balance compatible with obdurately irresponsible national monetary and fiscal policies" (1960: 77).

Why did Triffin find fault with flexible exchange rates? Triffin argued that flexible exchange rate systems are subject to destabilizing speculation, leading to their collapse (1960: 83-84). Propounding a cost-push theory of inflation, he expressed the view that expansionary monetary policy would lead to an exchange rate depreciation, which, in turn, would "stimulate increases in import prices," affecting "internal price, cost and wage levels in general" (1960: 83). Thus, depreciation would be ineffective: it would only raise domestic prices and costs in proportion to the depreciation. Furthermore, Triffin believed that "resistance to downward cost and wage adjustments would tend to impart a 'devaluation bias' to any system of exchange rate flexibility," that is, wage and price increases following a devaluation would neutralize the effects of the devaluation, necessitating further devaluations; "this bias," he added, "could not fail to make private exchange speculation far less 'stabilizing' than envisaged by the proponents of exchange rate flexibility" (1960: 83).

In *Gold and the Dollar Crisis,* Triffin also expressed the view that when the monetary authorities intervene in the foreign exchange market, say, by selling foreign currency in order to prevent the domestic currency from depreciating, that action "directly affects internal liquidity in a way which contributes to the balance of payments readjustments" (1960: 85). Thus, in this case, unsterilized intervention (purchases of the domestic currency and sales of foreign currency) reduces the domestic money supply and raises interest rates; it, thus, reduces domestic economic activity, thereby supporting adjustment and easing pressure on the exchange rate. The situation, he argued, was different in the case of "private stabilizing interventions." He stated: "The substitution of private capital movements in this role tends, on the contrary, to cushion the domestic as well as the foreign impact of the imbalance in the country's other external transactions, and to suppress at its roots the operation of the classical theory of monetary adjustment" (1960: 85). In other words, intervention by private market participants does not affect the money supply, domestic interest rates, and domestic economic activity.

In a letter, dated 24 April 1962, addressed to Machlup, Triffin provided a further argument against flexible exchange rates. Under a flexible exchange rate system that involved a degree of "management" of rates -- as opposed to completely floating rates without any intervention -- "management," he stated, "would almost certainly lead to conflicting interventions by various countries appraising differently the desirable pattern of rates among the various currencies involved... this was certainly the case in the early 30's and it would be most extraordinary indeed if the British took the same view as to what would be a desirable sterling-dollar rate as the Americans did regarding the most desirable dollar-sterling rate. This is what I call the 'multiple hot shower bath system'" (1962: 3).

Haberler, 1961, 1964. Following the publication of his monograph, *Currency Convertibility*, Haberler returned to the exchange rate issue in a 1961 report, "The Economics of International Markets," published in the *Congressional Record*, in a 1961 paper "The Deficit in the American Balance of Payments and the U.S. Foreign Economic Policy," published in *Public Policy* (a yearbook of Harvard's Graduate School of Public Administration), and in his AEA Presidential address, delivered in December 1963, and published in the *AER* in March 1964. Haberler's discussion of exchange rates in each of these works was marked by their brevity and the absence of argumentation in favor of flexible exchange rates.

In his *Congressional Record* statement, Haberler discussed the problem posed by large U.S. balance of payments deficits: "It is generally agreed that the deficit cannot be allowed to continue much longer ... without undermining confidence in the dollar" (1961a: 15778). There were two "acceptable and appropriate remedies" (1961a: 15779). Both remedies would bring about a fall in U.S. prices and costs relative to prices and costs of surplus (in the current account) countries. The preferred method of bringing about the necessary change in relative prices and costs, Haberler believed, was "a change in exchange rates, that is, by an appreciation of the currencies of the surplus countries relative to the dollar and the currencies of those other countries – the great majority of all countries -- whose balance is not in surplus" (1961a: 15781). The less preferred, but nevertheless effective, method was to achieve "relative disinflation" in the United States. Haberler stated: "All that the method of relative disinflation requires is a little more money wage discipline than we have had before" (1961a: 15779). Haberler did not mention flexible exchange rates. His policy advice involved a one-time appreciation of surpluses countries' currencies against the dollar -- devaluation of the U.S. dollar against those currencies, with the dollar's price against gold left untouched -- consistent with the rules of the Bretton Woods system.

In his 1961 paper for Harvard's *Public Policy*, Haberler focused on "the sudden deterioration" in the U.S. current account that had occurred in the late-1950s, which led to a deterioration in the country's overall balance of payments (1961b: 110). What caused the deterioration? Haberler argued: "What has happened is that the industrial countries in Europe, and Japan, have rapidly recovered from the destruction and dislocation caused by the war and have caught up with us. Their competition has become much stronger" (1961b: 110). To restore equilibrium in the U.S. balance of payments, the way forward, according to Haberler, was for the United States to pursue "anti-inflationary policies" and for the current-account surplus countries of Western Europe to "not resist the expansionary effects which emanate from their trade surplus" (1961b: 113). Haberler continued: "It is very important that these automatic forces be given sufficient scope and time to work themselves out so as to obviate the necessity of taking further corrective measures" (1961b: 113).

Haberler ruled out a depreciation of the dollar against gold. He argued: "a freely floating exchange rate which is allowed to fluctuate in a free market in response to the ups and downs of demand and supply (with a bare minimum of intervention to smooth out day-to-day fluctuations).... is not open to the U.S. because the U.S. is the world's banker and the confidence in the stability of the gold value of the world's principal reserve currency must not be betrayed" (1961b, 114). If the imbalance in the current account persisted, Haberler argued that the currencies of the surplus countries could be appreciated: "This would be feasible, however, only if the surpluses were highly concentrated on a few countries that are already in possession of a sufficiently or embarrassingly large international reserve" (1961b: 115).

In his 1963 AEA Presidential Address, titled "Integration and Growth of the World Economy in Historical Perspective," Haberler only touched on international monetary reform. He took it for granted that exchange rate adjustments had no chance of being adopted. In these circumstance, wage and price discipline in the United States would be needed to achieve external adjustment. Hence, his only reference to the exchange-rate-regime issue was the following.

> The extreme reluctance to change any exchange rate and the stubborn rejection of floating rates not only for reserve currencies, which is understandable, but also for nonreserve currencies throw a very heavy burden on internal price and wage adjustments. The successful operation of the present system requires, if world-wide inflation is to be avoided, a degree of financial and wage discipline which few countries have so far been able to muster. But the problem is not insoluble and, since the imposition of financial and wage discipline is, after all, the most important advantage that can be claimed for the system of stable exchange rates, we can only hope that sufficient discipline will in fact be forthcoming to bring about the necessary adjustments smoothly and speedily without causing severe restrictions of trade or serious unemployment in the process (1964: 20).

He concluded his address by referring to the issue of international liquidity. He noted that there were "a great number of plans to choose from. "Even the more modest ones," he stated, "would banish the danger of a general lack of liquidity" (1964: 20).

In sum, in the early-1960s Haberler was sympathetic to adjustments of exchange rates of certain currencies against the dollar. But he considered that the dollar's price in terms of gold was sacrosanct. He did not advocate flexible exchange rates. Instead, he favored one-time appreciations of the currencies of the current-account-surplus countries.

Machlup, 1962, 1964. With his move to Princeton University in 1960, Machlup became the Director of that institution's International Finance Section, which had established a reputation as a leading publishing outlet for policy oriented monographs on the global monetary system.[25] In 1962, Machlup entered the discussion about reforming the Bretton Woods system with the sixty-seven page monograph, *Plans for Reform of the International Monetary System* (hereafter, *Plans*), published by the Section in August. The monograph was followed in December by Machlup's testimony on international monetary reform before the Subcommittee in International Exchange and Payments of the U.S. Congress' Joint Economic Committee.

In *Plans*, Machlup began by providing the motivation for the monograph: "the relative shrinkage of the metallic nucleus of the [reserve] currencies" (1962: 2) which was responsible for "the anxieties and warnings with regard to deficiencies and dangers of the present international monetary system" (1962: 4). The purpose of *Plans* was to

[25] The International Finance Section began publishing the series of monographs *Essays in International Finance* in 1943. It subsequently also published the series *Studies in International Finance* (beginning in 1950), *Special Papers in International Economics* (beginning in 1961), and *Reprints in International Finance* (beginning in 1965).

survey the major proposals that had been put forth on international monetary reform. It is relevant to point out that in 1962 Machlup was, by-and-large, a newcomer to the subject of international monetary reform. Unlike Friedman, Haberler, and Triffin -- but like Fellner -- he had not cut his teeth in writing about either the pros and cons of flexible exchange rates or alternative methods of enhancing liquidity provision. Machlup's inexperience in dealing with international monetary reform likely played a role in his reluctance to *assess* the proposals surveyed in *Plans.* In the concluding chapter, Machlup (1962: 66) wrote: "The author has abstained -- or at least tried to restrain himself -- from making blunt value judgements."

Machlup identified the "three different problems" that characterized the Bretton Woods system (1962: 5) although he did *not* use the monikers: adjustment, liquidity, and confidence.

- *The adjustment problem.* Machlup wrote: "Some find the present system deficient because it gives counties in difficulties with their balance of payments [namely, the United States] too much time [to adjust], and others because it gives them too little time, to get over their troubles" (1962: 6). Machlup (1962: 6) attributed this view to Triffin.
- *The liquidity problem.* In further recognition of Triffin, Machlup expressed the view that "the short-term indebtedness" of the United States and the United Kingdom, the two key-currency countries, "must not be increased substantially in the coming years" in order not to undermine their value with regard to gold. However, with the supply of monetary gold being inelastic, "then it is quite plausible that a real, generally recognized scarcity of reserves will develop in the course of time" (1962: 10).
- *The confidence problem.* Again reflecting the influence of Triffin, Machlup stated that the "dollar glut" had led to concerns that the United States would not be able "to defend the gold parity of the dollar in the long run." He likened the situation in the early-1960s to that in 1931 when the U.K. was forced to abandon the gold exchange standard: "Hence, the more serious the fears that the gold-exchange standard will break down once again (as it did in 1931, when Great Britain went off gold), the more real becomes the danger of [the present system's] actual collapse" (1962: 11).

Machlup proceeded to discuss five major types of reform proposals that had been advanced for dealing with the above-mentioned problems. In brief, the proposals were the following: (1) extension of the gold exchange standard with the adoption of additional currencies -- namely, the German deutsche mark, the French franc, and the Swiss franc -- as reserves; (2) mutual assistance among central banks under which other central banks would purchase the currency of a central bank "in need of help" (1962: 17); (3) centralization of global monetary reserves, possibly though "the establishment of a world central bank" (1962: 25) which, under a variant proposed by Triffin, an expanded IMF would be given "a prerogative to initiate the creation of monetary reserves by means of an aggressive credit and open-market policy" (1962: 30); (4) increases in the price of gold, which would allow the U.S. and the U. K. "to repay, in part or in full, their demand liabilities to the countries holding foreign-exchange reserves. The 'net liquidity' of all central banks concerned would be increased as a result" (1962: 44). Each of these four plans for reform included variants, which Machlup covered in detail (pages 10 to 50), before he came to the fifth reform proposal -- "freely flexible exchange rates."[26]

Machlup noted that the flexible-exchange-rates proposal "is fundamentally different from the other four" proposals, all of which "were designed to serve the same objective, namely, to increase international liquidity." In contrast,

> The introduction of freely flexible exchange rates ... would relieve the central banks once and for all of any functions in the international payments system and would remove any requirement to hold reserves for foreign payments. This is so because equality of receipts and disbursements would be secured through the free adjustment of foreign-exchange rates to the supply-and-demand situation of the moment (1962: 51).[27]

Machlup distinguished among two variants of freely flexible exchange rates, both of which were preludes to the crawling peg. In this regard, he noted that (1) exchange rates could be allowed to fluctuate freely within a "predetermined spread" -- or band -- and (2) exchange rates could be influenced through foreign exchange intervention by the monetary authorities in order to avoid "unnecessary or excessive fluctuations in the

[26] Machlup (1962: 57-58) cited some twenty studies which had come out in favor of flexible exchanges, including those by Friedman (1953) and Haberler (1954).

[27] The view that flexible exchange rates "would remove" the need to hold reserves proved to be overly optimistic. The fact that countries have been acquiring reserves is essentially a reflection of the fact that their governments are deviating from floating by engaging in sterilized or unsterilized intervention.

rates." Machlup called these two forms of arrangements "freely flexible exchange rates with reservations." He regarded them as "more acceptable than perfectly free rates." He noted: "one can hardly expect monetary authorities to abstain under all circumstances from interfering in the market through their own sales or purchases" (1962: 52). But he identified two potential problems with flexible exchange rates. First, they would lead to less discipline on the monetary authorities than a system of fixed exchange rates. He wrote: "Assume our judgement of the heads, the hearts, the backbones and the guts of the monetary managers of a country leads us to expect that under a regime of fixed exchange rates they would hold the rate of price inflation down to 3 percent a year ... whereas the same managers under a regime of perfectly free exchanges would allow the rate of inflation to rise to 6 percent a year (1962: 59). Second, Machlup thought that fixed exchange rates reduce exchange-rate risk and, thus, lead to higher international trade than do flexible exchange rates (1962: 68). He noted, however, that "the risks of exchange *restrictions* imposed to 'protect' fixed exchange rates may be greater than the risks of exchange *fluctuations* in free markets, and that the effects of restrictions may weigh more heavily than the cost of hedging against the risk of fluctuations" (italics in original, 1962: 60).

Machlup's testimony before the Subcommittee of the U.S. Congress' Joint Economic Committee in December 1962 (published in 1963) saw him summarize the main arguments on international monetary reform presented in *Plans*, with the important difference that he was more forthcoming in presenting his own views during his testimony. Thus, after outlining the five reform proposals presented in *Plans*, Machlup stated that the major problem confronting the international monetary system was the Triffin dilemma: "The supply of reserve currencies to other nations depends on payments deficits incurred by the reserve countries; but the demand for these currencies will not endure if the reserve countries incur continual deficits. In a nutshell, the truth about reserve currencies is this: the more easily available, the less wanted" (1963: 201). Machlup then discussed how the five alternatives dealt with the problem of liquidity provision. As regards flexible exchange rates, Machlup (1963: 202) stated that they removed "the need for monetary reserves altogether," but that they came with two deficiencies. (1) Flexible exchange rates would "be detrimental to commerce and industry if no one could ever be certain how much he would receive for his exports or how much he would have to pay for his imports" (1963: 202). (2) Removing "the central bankers' obligation to keep exchange rates stable, and freeing them of the concern about the size of their foreign reserves, would probably make them less cautious in their credit policies and more willing to yield to the constant pressures for easier credit and cheaper money" (1963: 202). Flexible rates, Machlup argued, would thus remove "a potent cause for the central banker's self-restraint" (1963: 203).

Harry Johnson (University of Chicago) testified after Machlup.[28] In doing so, Johnson criticized Machlup's argument that flexible exchange rates would provide an inflationary bias. Johnson stated: "Now, I think Professor Machlup did not, in fact, go as far as he might have in describing the merits of this system [*i.e.,* flexible exchange rates], because I detected in his paper what I regard as a by now rather heretical and outdated opinion that the problem of inflation is a very serious one and one which it requires great effort to avoid" (Johnson 1963: 220). In his follow-up remarks to Johnson's testimony, Machlup backtracked after being prodded by Representative Henry Reuss, the subcommittee chair. Reuss addressed Machlup as follows: "freely flexible exchange rates, you felt, had an inflationary potential" (1963: 229). To which Machlup responded: "I am not so sure.... So I would not be so gloomy regarding the effects of freely flexible rates -- and I assume, from what Mr. Johnson said after me, he would go along with me on that" (1963: 229).

Machlup published an updated version of *Plans* in March 1964. In the Preface to the revised version, he wrote: "This new edition exceeds the 'obsolete' [1962] edition by 34 percent in terms of words printed" (1964, Preface). In terms of page length, the revised version was 90 pages compared with 67 pages for the 1962 edition. However, the text of the discussion on flexible exchange rates in the new edition was left untouched.[29] Reflecting Machlup's primary concern with liquidity, all of the added material in the second edition dealt with ways to create international liquidity.

Friedman, 1963. On 14 November 1963, Friedman appeared before the Joint Economic Committee (JEC), chaired by his former Chicago colleague, Senator Paul Douglas. In introducing Friedman, Douglas called him "perhaps the foremost advocate in this country of flexible exchange rates" (Friedman 1963: 451). The Hearings

[28] Johnson began publicly favoring flexible exchange rates in the early-1960s, but he did not think that they would be adopted (at that time) because of opposition from central banks. For discussions of Johnson's views on flexible exchange rates, see Obstfeld (2020) and Tavlas (2025a).

[29] The second edition added footnotes citing additional authors who had come out in favor of flexible exchange rates since the first edition was published.

conducted by the JEC focused on measures to reduce the U.S. balance of payments deficit. Friedman's testimony appeared under the heading: "Exchange Rates: How Flexible Should They Be?"[30]

Friedman began by noting that the foreign trade sector comprised only five percent of U.S. national income, yet the balance of payments deficit had become "a major preoccupation in [U.S.] international political negotiations" (Friedman 1963:452). He then described four alternative methods that could be used to address the deficit: (1) the U.S. could draw on its reserves or borrow from abroad to finance the deficit; (2) U.S. prices could be kept from rising as rapidly as foreign prices; (3) the U.S. could impose additional controls on exports, imports, and capital movements; (4) the dollar's exchange rate could be altered. Each of the first three methods, Friedman argued, would be unsatisfactory. Drawing on reserves or borrowing from abroad to finance the excess of imports was a temporary device that could be relied on only if the disturbance were temporary (1963: 453). Lowering U.S. prices relative to foreign prices would entail tighter U.S. macroeconomic policies and would produce considerable unemployment at home, and possibly a recession (1963: 453-54). Additional controls on trade and capital flows were techniques employed by the Nazis; they were contrary to a free market economy (1963: 458).

The remaining way to adjust was to allow or force the price of the dollar to fall relative to other currencies. Unlike the other three methods, exchange rate changes would alter the relative price of U.S. and foreign goods "in precisely the same way as [do] ... changes in internal prices in the United States and in foreign countries.... without requiring anything like the same internal adjustments" in terms of employment loss (1963: 454).

The nominal exchange rate, in turn, could be changed in either of two ways: *permitting* it to change, as under floating, or *forcing* it to change, as under the adjustable peg. The latter method, Friedman argued, "has serious disadvantages." He continued:

> It makes a change in rates a matter of major moment, and hence there is a tendency to postpone any change as long as possible. Difficulties cumulate and a larger change is finally needed than would have been required if it could have been made promptly. By the time the change is made, everyone is aware that a change is pending and is certain about the direction of change. The result is to encourage

[30] Several of the arguments in Friedman's testimony had been previously made in Friedman (1961) and Friedman (1962). I thank Ed Nelson for this observation.

> flight from a currency, if it is going to be devalued, or to a currency, if it is going to be appreciated (1963: 455).

Moreover, Friedman affirmed that "speculative movements increase the difficulty of judging what the new rate should be, and introduce a systematic bias, making the change needed appear larger than it actually is" (1963: 455). The result is that the monetary authorities typically "play safe" by devaluing more than is necessary. Finally, even if the foregoing difficulties could be avoided and the new rates when first established were the correct rates, "they will not long remain correct" (1963: 455). The preferred method of achieving external adjustment, Friedman argued, was to allow exchange rates to adjust in response to market forces: "this is the method of the free market, the method that we adopt unquestionably in a private enterprise economy" (1963: 456).

Should the government intervene to affect the exchange rate in a floating rate regime? Friedman did not think so because, in his view, there was "a strong tendency for government agencies to try to peg the rate rather than to stabilize it, because they have no special advantage over private speculators in stabilizing it, because they can make far bigger mistakes than private speculators risking their own money, and because there is a tendency for them to cover up their mistakes by changing the rules ... rather than by reversing course" (1963: 456). Nevertheless, Friedman left the door open to intervention under a floating system: "Clearly, it is possible to have a successful floating rate along with governmental speculation" (1963: 456).

Friedman also discussed why, despite their advantages, floating exchange rates had received "a bad press" (1963: 456). One reason, he argued, was that countries that had "gotten into severe financial difficulties, for whatever reason, have had ultimately to change their exchange rates" and revert to floating rates. Consequently, "floating rates have frequently been associated with financial and economic instability," even though floating rates had nothing to do with the financial difficulties (1963: 457). Unstable exchange rates, he argued, were due to unstable economic fundamentals -- and not to floating rates. "This misreading of experience," Friedman asserted, had been "reinforced by the general prejudice against speculation," which led to the widespread view that speculation in exchange can be expected to be destabilizing and, thereby, to increase the instability in rates. Friedman stated: "Few who make this assertion even recognize that it is equivalent to asserting that speculators generally lose money" (1963: 457).

Friedman concluded by discussing the issue of the fixed price of gold. He noted that the Bretton Woods system was a dollar standard and that the U.S. authorities fixed the gold price and did not have to do much by way of domestic policy to enforce the peg (partly because U.S. residents could not hold gold).[31] The fixed gold price, he argued, should be terminated: "The price of gold should be determined in the free market.... This is the appropriate counterpart of a policy of floating exchange rates.... There is no reason why gold, like other commodities, should not be freely traded on a free market" (1963: 459).

3.3 Bellagio Group

In 1963, Machlup, Triffin and Fellner co-organized a group of academic economists (hereafter, G32) from eleven countries to undertake a study on international monetary reform "designed to interpret their disagreements in a form potentially useful to decision-makers" (Machlup and Malkiel 1964: 6). The group, which came to be known as the Bellagio Group, included several members with "an international reputation" (Machlup and Malkiel 1964: 9); the initial membership was chosen so that there would be representatives from each of the G10 countries.[32] Between December 1963 and May/June 1964, the Bellagio Group met four times -- twice in Princeton and twice in Bellagio, Italy.[33] The number of attendees at the four meetings varied: a total of 32 economists attended at least one meeting. Several of the participants were considered to have been sympathetic toward flexible exchange rates. These included Haberler, Johnson, and Sohmen. Milton Friedman was listed as part of a group "who had indicated interest in the project ... but eventually found it impossible to come" (Machlup and Malkiel 1964: 11).

[31] I thank Ed Nelson for this point.

[32] As mentioned in the introduction, the group met twenty-two times from 1963 to 1974. The group derived its name from the Rockefeller estate at Bellagio in Lake Como, Italy, where the group sometimes convened. The Bellagio Group ceased to meet after the collapse of the Bretton Woods system, at which time the global monetary system moved to generalized floating exchange rates. It was revived in 1996 by Andrew Crockett, the then-General Manager of the BIS, and it continues to meet.

[33] The dates were, December 18 and 19, 1963, and March 21 and 22, 1964 in Princeton; January 17 to January 23, 1964 and May 29 to June 6, 1964 in Bellagio.

By June 30, 1964, the Bellagio Group had completed a report. The objective was to "*analyze* in a scholarly fashion the assumptions which underlie alternative approaches" to international monetary reform (original italics, Machlup and Malkiel 1964: 21). In doing so, it spelled out the "three major problems concerning the present international monetary system" (Machlup and Malkiel 1964: 24): (1) "the problem of payments *adjustment*, deriving from the need for correcting persistent imbalances in the payments positions of individual countries;" (2) "the problem of international *liquidity*, connected with the need for long-term adaption of the total volume of world reserves to the full potentialities of non inflationary growth;" and, (3) the problem of *confidence* in the reserve media, implied in the need for avoiding sudden switches between different reserve media" (italics supplied, Machlup and Malkiel 1964: 24).

As Machlup had done in his 1962 monograph, *Plans*, the Bellagio report considered "major approaches, or systems," (Machlup and Malkiel 1964: 70) for reforming the international monetary system. (1) "Semiautomatic" gold standard under which the price of gold would be increased "by an amount sufficient for the United States to pay off its obligations to foreign monetary authorities" (Machlup and Malkiel 1964: 78). Thereafter, the price of gold would remain fixed and the system would operate as under the gold exchange standard.[34] (2) Centralization of central bank foreign exchange reserves (including gold) with the IMF, which would be able to undertake open-market operations in member countries (Machlup and Malkiel 1964: 85-86). This proposal was Triffin's. (3) Multiple currency reserves. As under one of the proposals in Machlup (1962), the major countries would agree to acquire the currencies of other major countries (Machlup and Malkiel 1964: 91-92).

A fourth approach was a system of flexible exchange rates, which, as mentioned, had several supporters among the G32. After discussing arguments in favor and against freely floating rates, the G32 report stated: "Complete prohibition of intervention in the foreign exchange markets, by national monetary authorities, is unrealistic and not likely to be accepted, because the monetary authorities will believe it is essential for them to intervene" (Machlup and Malkiel 1964: 98). The report cited "socially undesirable

[34] In personal correspondence, dated 21 August 2025, with the author, Burton Malkiel, a member of the Bellagio Group and who, along with Machlup, wrote the first chapter of the report, stated: "There was perhaps more attention than it deserved to instituting a gold standard because of the imposing interventions of Jacques Rueff." Rueff, an advisor to French President Charles de Gaulle in the 1960s, was a staunch proponent of the gold standard and a strong critic of the dollar as a reserve currency.

consequences" from private speculation "that should be prevented by official counterspeculation" (Machlup and Malkiel 1964: 98). Given the need for official intervention, the G32 recommended a system with intervention that takes place at the edges of a band around central rates: intervention could "be made realistic ... only between stated upper and lower limits to exchange-rate variation. The setting of such limits, at which official intervention becomes mandatory, will encourage stabilizing speculation by limiting the extent to which exchange rates can move in one direction" (Machlup and Malkiel 1964: 98-99). It would also exercise discipline "on the freedom of the national monetary authorities to pursue inflationary or deflationary policies, since to keep within the limits they will be obliged to follow policies broadly in line with those of other countries" (Machlup and Malkiel 1964: 99). The idea that intervention would take place at the edges of the band was a preview of what Williamson (1965: 2) described as a component of the crawling peg.

A final point about the G32 report. Its orientation was strongly in the direction of ways of dealing with the liquidity problem; its attention to flexible exchange rates was minor in comparison. The report stated: "Except for a system of unlimited, unmanaged flexibility in exchange rates ... the liquidity problem is a meaningful one." In other words, flexible exchange rates assume away the liquidity problem rather than address it: "one of the main distinguishing features of most plans for interventional monetary reform is their particular approach to the problem of creation or provision of reserves" (Machlup and Malkiel 1964: 55). This emphasis on liquidity creation, and the corresponding de-emphasis on flexible exchange rates, reflected the influence of Triffin. This influence was a concern for Harry Johnson, who, after attending the third meeting, held in Princeton on March 21 and 22, 1964, wrote to Machlup on March 23: "the proceedings went quite contrary to the spirit in which the exercise was conceived.... [We] spent most of the time at Princeton producing a statement which was to influence the group of ten in the direction of the Triffin plan. All other aspects of the plan were shelved."[35]

Machlup presented the Bellagio Group report at the annual meeting of the AEA in December 1964, summarizing the four international monetary arrangements – the semiautomatic gold standard, centralization of international reserves, multiple currency

[35] In personal correspondence (mentioned above) to the author, Burton Malkiel confirmed: "Much of the discussion related to the Triffin Plan, which was much discussed at the time."

reserves, and flexible exchange rates – proposed by the Group for dealing with the adjustment, liquidity, and confidence problems. Machlup (1965: 170) stated that "the report does not endorse any particular system or type of international monetary system." Yet, as in the report, Machlup noted that opponents of flexible exchange rates questioned whether central bankers would be able to resist the temptation to inflate their economies: "the question is whether their [*i.e.*, governments'] resistance to inflationary pressures will or will not be reduced if the fear of dwindling international reserves is removed" (1965: 168). Machlup also pointed out that the costs of hedging under flexible exchange rates could discourage international trade: "Opponents and advocates of flexible rates entertain opposite assumptions regarding these possibilities" (1965: 169).

Friedman, 1965. There were three discussants of Machlup's presentation at the December 1964 AEA meeting, one of whom was Friedman.[36] After mentioning that he had been invited to be a member of the G32 but was unable to accept the invitation, Friedman called the report "a model of its kind. No student of international monetary arrangements, however profoundly he has studied the subject, can fail to be instructed by its careful unraveling of the strands that combine to form a judgment in favor of one or another policy" (1965: 178). However, instead of discussing the contents of the report, Friedman proceeded to discuss a particular problem of the adjustable peg.[37]

The backdrop to Friedman's remarks was the U.K.'s balance-of-payments crisis in 1964. This crisis led to heavy reserve losses and an international rescue package that included loans from the United States, Canada, Japan, and Continental European Countries. The rescue package also included measures that required the U.K. to restrain domestic demand (Solomon 1977: 88-91). Friedman criticized the rescue package: "it has done nothing to remove the conditions which gave rise to the crisis.... On the contrary, it may have made [another crisis] more likely by encouraging governments to

[36] The other two discussants were Edward Bernstein (who had been Director of the IMF's Research Department from 1946 to 1958) and Milton Gilbert (then with the BIS). Gilbert (1965: 187) made a comment that is relevant for the present study: "it is very misleading to classify managed flexible rates (or a system with wider margins) as a variation of pure flexible rates. Once management of the market is allowed for, flexible rates would be much more a variation of pegged rates."

[37] By not addressing the contents of the report, Friedman may have not wanted to directly criticize a report spearheaded by Machlup. Friedman and Machlup had a close personal relationship. They began corresponding in early 1935 in regard to a fellowship Friedman has been awarded to work on his Ph.D. thesis. Both were founding members at the Mont Pelerin Society in 1947. In the 1950s they corresponded about political issues, including the rise of Joseph McCarthy in the Republican Party. Both abhorred McCarthy.

postpone adjustments because of the knowledge that if worst comes to worst they can count on rescue funds" (Friedman 1965: 179). The main target of Friedman's criticism of the U.K. rescue packages was that it internationalized U.K. economic policies: "The key issue is ... whether, without an explicit political decision, a country should, in effect, give extensive power over its economic policy to specific governmental officials of other countries, in whose selection its own people have no say, direct or indirect" (1965: 179). Thus, Friedman framed the debate about flexible versus fixed exchange rates as a contrast "between systems whose operation depends on explicit management by a collection of national central bankers or officials of an international central bank and systems that do not" (1965: 180). Friedman concluded: "This political aspect of the monetary arrangements is the ghost that haunts the discussion" (1965: 181).[38]

Fellner, 1964. Fellner's participation in the Bellagio Group provided him with the opportunity to express a view on the exchange-rate-system issue. Each participant was allowed to submit a separate statement "so that [the participants] could emphasize particular points, explain a personal position, or present any comment he might wish to make" (Machlup and Malkiel 1964: 15). Fellner was among seven participants who chose to do so.

In his comment, Fellner favored limited, unmanaged flexibility of exchange rates under which intervention in the market would only take place at the upper and lower margins (Fellner 1964: 112). He wrote: "I also believe that the world might gradually get around to limited, unmanaged flexibility" (Fellner 1964: 112). As mentioned, the setting of such limits at which intervention is mandatory was thought by the Bellagio Group to encourage stabilizing speculation, reduce exchange rate volatility, and provide discipline on the conduct of monetary policy. As for other versions of flexible-exchange-rate arrangements, Fellner regarded them as "unrealistic and undesirable" (Fellner 1964: 112). The solution to the liquidity problem, he thought, was "the multiple currency idea" (Fellner 1964: 113).

3.4 Haberler Redux, 1965

[38] See Nelson (2009) for an excellent account of Friedman's views on the U.K.'s economic policies during the period, 1938-1979.

Haberler revisited the role of the exchange rate regime in a 1965 monograph, *Money and the International Economy*. The monograph was motivated by the then-ongoing discussions on alternate ways to increase international liquidity.

In the monograph, Haberler emerged once again as a supporter of greater exchange rate flexibility. Fixed rate systems, he argued, are prone to a deflationary bias: since money wage rates tend to be rigid in a downward direction, macroeconomic adjustment to a balance-of-payments deficit tends to produce higher unemployment in those countries. The Bretton Woods adjustable peg did not avoid the problem because, over time, it increasingly became a fixed rate system (1965: 28-29).

Haberler reconsidered the issue of destabilizing speculation under both the adjustable peg and flexible rates. He argued: "Life is made easy for the speculator under the adjustable peg: he can be sure to make a large gain if he is right, but he cannot lose more than the small costs of transfer and interest differential if he is wrong" (1965: 29). Although Haberler believed that "there could conceivably be destabilising speculation under flexible exchange rates," he also believed that movements in the exchange rate "would eventually be self-correcting" (1965: 29). He accepted the argument that exchange-rate volatility under flexible rates hampers international trade, but thought that the cost of hedging against such volatility was "a minor consideration if exchange rate variations are used either to avoid severe unemployment in a country with a considerably overvalued currency or to ward off substantial inflation which otherwise would be imposed on disciplined countries by their inflationary neighbours" (1965: 32). Haberler's main criticism of flexible exchange rates was that they exert less discipline on central bankers than fixed rates. This criticism marked a reversal of the view expressed in his 1954 monograph, *Currency Convertibility.*

Although Haberler came out in favor of flexible rates, he thought that they would not be adopted by all countries, especially the reserve currency countries. Therefore, he proposed a compromise solution. First, "some other countries [would] put their currencies on a floating basis" (1965: 34-35) against the reserve currency countries. Second, the bands against the central rates would be widened from one percent on each side of parity to four to five percent. As we shall see, the latter proposal would become part of the crawling peg regime advocated by Haberler, Fellner, and Machlup in the latter part of the 1960s.

3.5 New York Times, February 21, 1966

In February 1966, the *New York Times* published a letter, co-signed by twenty-seven economists, on the problems confronting the international monetary system. The signers included well-known proponents of freely floating exchange rates: Friedman, Johnson, Meade, and Sohmen. The signers also included Fellner, Haberler, and Machlup,[39] but not Triffin. The letter began: "The discussion of possible reform of the present system of international payments has been largely focused on the problem of 'international liquidity.' More specifically expressed, the discussion has been focused on the temporary financing of imbalances through providing additional reserves and borrowing facilities and on promoting the adjustment process through monetary and fiscal policies. The no less important issue of exchange rates has received little attention in official circles" (*New York Times* 1966).

The letter went on to argue that more exchange rate flexibility was needed so that countries could achieve "domestic economic goals simultaneously with equilibrium in external payments." To this end, the letter proposed two modifications of the Bretton Woods adjustable peg. First, the bands around central exchange rates against gold would be widened from ±1 percent to ± 4 or ±5 percent, giving a spread of 8 or 10 percent between the upper and the lower support points: "This first reform would render possible day-to-day fluctuations in exchange rates sufficient to absorb many balance-of-payments disturbances without disrupting foreign trade and investment." Countries could choose to "peg their currency to another country, or groups of countries could agree to keep the currencies of members of the group fixed in relation to one another. Second, countries would be allowed to unilaterally change the par values of their currencies "by no more than one or two percent of the previous year's par value." The letter stated: "This seems at first more restrictive than present rules, which allow changes up to ten percent without prior approval by the IMF; yet since the present permissible changes are based not on last year's but on the originally announced par values which in many cases are now hopelessly out-of-date, our proposal is, in effect more permissive." The economists noted that they differed amongst themselves on "the ideal set of rules and institutions" that were needed to complete international monetary

[39] The other signers were William Bauer, Richard E. Caves, Alan C. L. Day, Herbert Giersch, L. Albert Hahn, George N. Halm, Alvin H. Hansen, Arnold C. Harberger, Hendrik S. Houthakker, Bertrand de Jouvenel, Friedrich A. Lutz, Allan H. Meltzer, Lloyd A. Meltzer, Fritz W. Meyer, Tibor Scitovsky, Arthur Smithies, Ingvar Svennilson, Jan Tinbergen, Jaroslav Vanek, and Michel Woitrin.

reform, but "all of us hold that the alternations we propose would constitute a great improvement over the present situation" (*New York Times* 1966).

Two comments are in order. (1) The proposed regime was a compromise between freely floating rates and a crawling peg. Unlike free floating, the proposal placed limits on permissible exchange rate fluctuations. As under the crawling peg, the central rate would be allowed to "crawl" – small, annual changes in the central rate would be permitted. Unlike the crawling peg, the monetary authorities would not be obligated to intervene at the limits of the bands. (2) Gold would continue to play its role as a numeraire, contrary to Friedman's view. Some signers (e.g., Friedman, Johnson, Sohmen), although actually in favor of freely floating exchange rates, went along with endorsing what they felt would be at least a first step in that direction.[40] For Fellner, Haberler, and Machlup, the proposal marked a move in favor of a regime -- the crawling peg -- which they each would champion into the 1970s.

Fellner, 1966. We have seen that in 1964 Fellner had argued in favor of an exchange rate system the key characteristic of which was mandatory intervention at unspecified margins. By 1966 his preference had evolved into the crawling peg: frequent changes in the central rate, wide bands (±5 percent), no intervention within the margin, mandatory intervention at the edges of the bands. He expressed this preference in a paper "On Limited Exchange-Rate Flexibility" in which he reproduced the 1966 letter signed by twenty-seven economists, published in the *New York Times*.[41] Fellner (1966: 112) wrote that the sponsors of that letter had been Haberler, Machlup, Tibor Scitovsky (Stanford), and himself.

In his article, Fellner noted that several signers of the *New York Times* letter – presumably including Friedman, Johnson, and Sohmen – would have preferred exchange rates with unlimited flexibility – that is, without central rates. Others, including Fellner himself, favored mandatory intervention at the edges of bands but no official intervention within the band because it "would be very difficult to devise and enforce agreements which would exclude the danger of official actions at cross-

[40] This point in reference to the letter was made by Yeager (1967: 297).

[41] The paper was published in a book, *Maintaining and Restoring Balance in International Payments*, edited by Machlup, Fellner, and Triffin. The papers in the book had been presented at conferences comprising both members of the Bellagio Group and G10 officials. Each of the three co-editors contributed papers that recommended prompter exchange rate adjustments to balance-of-payments disequilibria -- Fellner and Machlup more firmly than Triffin.

purposes" (1966: 119). What explained the difference in views between those who favored unlimited flexibility and those who favored intervention at edges of bands? Fellner attributed the difference to contrasting views about the nature of speculation:

> Those who trust the stabilizing effect of speculation completely usually favor unlimited exchange-rate flexibility with no support points and no monetary reserves. If for the time being these economists are willing to accept the band proposal, this is because in their view the proposal is a step in the right direction. Among the signers of the statement here discussed, there are no doubt some adherents of unlimited flexibility. Many of us, including the present writer, consider unlimited flexibility too risky, because we feel that while in most cases speculation would probably have a stabilizing effect, serious trouble could arise in instances where, under any feasible interest-rate policy, the effect happens to be destabilizing (1966: 117).

Fellner continued:

> Some would say that these misgivings are far-fetched, but I am among those who feel that speculation may occasionally cause severe disturbances, or may occasionally fail to eliminate exchange-rate movements which at the initial cost levels would prove temporary but which could affect "irreducible" money costs without much delay. This is why I believe that our institutions should play safe by *prescribing* official intervention in the currency markets at the two limits of a band (italics in original, 1966: 118).

Fellner went on to argue that the crawling peg proposal did not preclude that groups of countries could agree to keep their exchange rates fixed in relation to each other in light of the "danger of lasting aftereffects such as could occasionally develop from otherwise temporary movements in exchange rates" (1966: 118).

3.6 JEC, 1966: Friedman, Machlup, Triffin

In December 1966, Friedman, Machlup and Triffin were among a group of seventeen economists who presented statements to Congress' Joint Economic Committee's Subcommittee on International Exchange and Payments. In a questionnaire, the economists were asked whether they believed that a dollar crisis was inevitable in light of the large U.S. balance of payments deficits. If a crisis was judged to be inevitable, the JEC's questionnaire asked: "how long do you think it would be before it came, and what would be the principal reasons for it?" (Triffin 1966: 117).

Friedman. Friedman stated that "an international monetary crisis is always a possibility." It would be "a result of a widespread demand for conversion of dollars into gold, or, indirectly, as a result of a crisis in sterling." Why was a dollar crisis a possibility? "The key reason, Friedman argued, "is because we have an international system of pegged exchange rates. The single and only effective way to make a crisis of this kind impossible is to introduce a system of free market exchange rates. That would provide an automatic and effective adjustment mechanism for changes in international trade" (Friedman 1966: 30). To avert a crisis, Friedman advised that the United States should proceed on its own "to set free the price of the dollar in terms of other currencies to find its own level in world markets." He noted that he had appeared before the JEC three years earlier (reported above) and gave identical advice. He referred to his earlier JEC statement, adding: "The experience of the past three years has only strengthened my belief that my earlier statement outlines the most desirable policy for the United States to follow" (Friedman 1966: 30).

Machlup. Machlup expressed the view that a dollar crisis had begun: "central bankers and finance ministers of important countries were heard in 1965 and even in September 1966 talking about the continuing tendency of the payments deficit of the United States to provide unwanted dollar reserves to the world" (Machlup 1966: 75). Foreign central banks, he argued, had begun to convert their dollars into gold. Triffin's prediction had been borne out: "The long-predicted Triffin crisis had arrived, not in the expected form of an emergency, but as an inconspicuous turning point.... The significance of this turning point for the world monetary system can hardly be exaggerated" (Machlup 1966: 75).

Machlup provided two main ways to reform the international monetary system so as to avoid future crises. First, it was essential to "create additional international reserves" through either "drawing rights (*i.e.,* SDRs) or through additional reserve assets" (Machlup 1966: 76). Second, to take pressure off the dollar, Machlup recommended "to create bearish expectations regarding the future price of gold" so as to reduce the demand for gold (Machlup 1966: 78). What techniques could create bearish expectations for the price of gold? Machlup suggested: "the cessation or limitation of gold purchases by the U.S. Treasury; preannounced periodic small reductions in the buying and selling price of gold; preannounced imposition of seigniorage charges for acquisition of gold; a wider margin between buying and selling prices of gold; and probably others designed to depress the dollar value of gold in the near future" (Machlup 1966: 78). Machlup did not mention the use of floating exchange rates as a means of addressing the crisis which he thought underway.

Triffin. In response to the possibility of a crisis, Triffin stated: "A crisis is never inevitable, but I would regard a crisis, or even a succession of crises, as highly probable in a matter of months rather than years" (Triffin 1966: 117). The cause? "The process of adjustment is unsatisfactory. It has, for many years, allowed the United States to run excessive deficits -- particularly on long-term capital account -- financed by a dangerous increase in our short-term indebtedness to foreign central banks, accumulated by them as 'international reserves,' but legally subject to gold conversion on demand or short notice" (Triffin 1966: 116). Triffin then submitted a fourteen-page "Supplementary Paper and Supporting Evidence" along with a twelve-page "Appendix" which presented ways of creating international liquidity. The possible use of floating exchange rates was not mentioned.

3.7 New York Times, November 26, 1967

Reflecting sustained selling pressures on the pound sterling during 1966 and 1967, on 18 November 1967, sterling was devalued by 14.3 percent (from \$2.80 to \$2.40).[42] On 26 November 1967, Fellner, Friedman, Johnson, and Machlup, co-authored a letter on the devaluation in the *New York Times*. The authors referred to the "long-drawn-out and wasteful efforts" that had been to maintain sterling's exchange rate prior to the devaluation. Sterling's "abrupt devaluation," the authors stated, was "apt to cause substantial dislocations." These dislocations could have been avoided if sterling had not been pegged but had "all along been allowed to find its true equilibrium level by gradual adjustments in the market." Then they argued: "Recent events have further strengthened our own conviction that policy makers ... should put flexible exchange rates promptly into effect, with allowance for the probable desire of some countries to form larger currency areas." As for the United States, the authors stated: "we should make the dollar independent of gold and should cease to link our currency to foreign currencies at rates that do not satisfy the conditions of international equilibrium" (*New York Times* 1967). The letter did not refer to the crawling peg arrangement or to any of its elements (a crawling central rate, widened bands, mandatory intervention). The letter appears to have been written at Fellner's initiative: it was postmarked "New Haven."

4. Breakdown, late-1960s to early-1970s

[42] For an account of the 1966-67 sterling crisis, see Solomon (1967: 91-93).

4.1 Historical Context

The late-1960s and early-1970s saw the collapse of the Bretton Woods system. The collapse reflected (1) the fulfilment of Triffin's prophecy that the accumulation of dollar liabilities to foreign monetary authorities would not be sustainable, (2) the deterioration in the U.S. competitive situation, exacerbated by the policies of President Lyndon Johnson's Administration to fund both the expanding Vietnam War and its Great Society Program, and, (3) related to the expansionary U.S. policies, the incompatibility of different national policy stances within the system (Kenen 1987: 236-37; James 1996: 205). By the late-1960s, U.S. inflation was rising, the U.S. current account surplus was declining, and the U.S. position as a stable center of the monetary system was vanishing (Kenen 1987: 236). With the United States experiencing large outflows of officially-held gold in early-1968 the Bank of England closed the London gold market on 15 March. When the market re-opened two weeks later, the monetary authorities of the major countries had agreed to transact only with each other (and not in the private market) at the $35 per ounce price, creating a two-tier gold market.

Two initial breaks in the commitment to pegged exchange rates occurred in the late-1960s, with a devaluation of the French franc and a revaluation of the German deutsche mark. A first act in the franc-mark drama occurred during the course of 1968-69. The French economy appeared to be in a strong position heading into a 1968, with buoyant growth and a current account surplus the previous year (OECD 1968: 26). However, in May 1968, a series of national strikes erupted, paralyzing the economy, and leading to large wage increases that resulted in a deterioration in competitiveness and moved the current account into deficit. With the country rapidly losing reserves in 1969, in August the franc was devalued by 11.1 percent. The second act in the franc-mark drama played out in the fall of 1969 when rumors of a mark revaluation led to a surge of capital inflows into Germany, causing the authorities to let the mark float in late-September rather than accumulate more reserves (and, thus, increase the money supply). During the next month, the mark appreciated by about 10 percent and, in late October, the currency was revalued by 9.3 percent (Solomon 1977: 164; Kenen 1987: 236-37).

The fatal break in the Bretton Woods system came in 1971, when the U.S. balance-of-payments deficit suddenly widened. In May, the German mark was again allowed to float; most other Continental European countries followed – thus, "the dollar was in practice now floating against the major world currencies" (James 1996: 220). The crisis came to a head on 15 August when, among other measures, President Nixon, following a meeting with his top economic officials at Camp David, Maryland, imposed a 10 percent surcharge on imports, instructed the Secretary of the Treasury, John Connally, to suspend purchases and sales of a gold (*i.e.*, the gold window was closed) and imposed a 90-day wage-price freeze. After several months of bargaining between the United States and the other major industrial countries, during which time the mark, the Japanese yen, and other currencies continued to float, an agreement was reached at the Smithsonian Institution in Washington DC on 17 December, 1971. Most other major industrial countries agreed to revalue their currencies against the dollar – on average, the dollar was devalued by 10 percent. It was also agreed to widen the bands around central rates from ±1 percent to ±2.25 percent; the 10 percent import surcharge by the U.S. was removed (Solomon 1977: chap. 12 and chap. 13; Kenen 1987: 236-37). The gold window was not reopened (see Nelson 2020, vol. 2: 288-97).

The new system, however, quickly fell apart. In June 1972, sterling came under selling pressure and was allowed to float. At the beginning of 1973, the dollar again came under selling pressure. By early February 1973, it was clear that another crisis was under way. On 12 February, 1973, U.S. Secretary of the Treasury George Shultz announced a 10 percent devaluation of the dollar. On the same day, Japan floated the yen. In March, six Continental European Countries – Belgium, Denmark, France, Germany, Luxembourg, and the Netherlands – announced they would jointly float their currencies under an agreement in which bilateral margins between their currencies were limited to ±1.125 percent. Most developing countries continued to peg their currencies to the dollar or to the currency of another industrial country (Solomon 1977: chap. 12 and chap. 13; Black 1987: 236-37). Solomon characterized these developments as follows: "[They] altered the existing system profoundly, though no one was sure at the time whether floating exchange rates were to be a temporary aberration or a more long-lasting phenomenon" (1977: 247).

4.2 Late-1960s

Machlup, early-1968. Machlup published the paper "International Monetary Arrangements" in the July/August issue of *Financial Analysts Journal*. As we shall see, the paper was likely written before May 1968, the month in which riots erupted in France.

Machlup began by arguing that the Bretton Woods system that emerged in the late-1940s "came to an end in 1965. The present situation is one of ongoing collapse and cannot be kept unchanged no matter how hard we try" (1968a: 25). U.S. policymakers, Machlup believed, had assigned priority to solving the liquidity problem, followed by the adjustment and confidence problems, in that order: "This is wrong; the order of priorities should have been exactly the reverse" (1968a: 26). The confidence problem, he argued, "is most urgent and no time should be lost" (1968a: 30).

Why was confidence the most important problem? Machlup was worried about the "*overhang* of dollars in foreign possession" (italics in original, 1968a: 26). As posited under the second leg of the Triffin dilemma, Machlup thought that the global financial system was on the verge of a crisis due to the possibility of widespread conversions of foreign holdings of dollars into gold. One proposed solution to this problem, Machlup noted, would be an increase in the price of gold -- say a doubling. Machlup was strongly against that solution because, in his view, it would penalize those countries which had not already converted their dollars into gold – "our best friends [who] ... trusted us" – and, because the resulting increase in global reserves, "would produce the largest worldwide inflation of all time." It would be "a criminal debasement of the moneys of all people of the free world" (1968a: 28).

How, then, could the confidence problem be addressed? Machlup proposed that the foreign exchange reserves and the gold holdings of IMF member countries be pooled into a "central Conversion Account or Reserve Settlement Account" with the IMF. That Account "should take over the gold, the dollars, and the pounds now held by national monetary authorities, who would then treat their deposits with the Account as monetary reserves" (1968a: 30). Machlup argued:

> The logic of such a scheme is clear: If dollars held by national monetary authorities are exchanged into gold held by the United States, dollar reserves are destroyed and total reserves are reduced. If, however, both the dollars and the gold are brought together in a central pool and the resulting deposits are used as monetary reserves, the total of reserves is maintained" (1968a: 30).[43]

[43] Why would a conversion of dollars held by non-U.S. monetary authorities into gold held by the U.S. lead to a destruction of global reserves? Because the conversion would leave non-U.S. global reserves unchanged but would reduce U.S. reserves since dollar balances were not part of U.S. reserves.

Regarding the liquidity and the adjustment problems, Machlup believed that the creation of SDRs had solved the former problem: "Special Drawing Rights ... will take care of the problem of liquidity, and no other arrangements for the creation of additional 'liquidity' are needed or even desirable" (1968a: 27). What about the adjustment problem posed by the U.S. balance-of-payments deficits? Machlup argued that restrictive U.S. fiscal and monetary policies would help prevent the deficit "from becoming worse" (1968a: 3). But the only real solution would be the "appreciation of the currencies of the major surplus countries: France, Germany, Italy" (1968a: 27). As mentioned, following the strikes in France in May 1968 and the subsequent wage increases, the franc was devalued in August 1969. Machlup's recommendation that the French franc should be appreciated was outdated at the time his article was published.

A final point about Machlup's 1968 article. Machlup did not address the exchange-rate regime issue. But he did offer one observation that marked a reversal of his earlier view that flexible rates hamper international trade: "Forward markets develop overnight [under flexible rates] ... and make foreign trade under variable rates as safe and as easy under fixed rates" (1968a: 25).

Machlup, late-1968. By autumn 1968, Machlup had come to fully support the crawling peg arrangement. This circumstance was reflected in his statement delivered to the *JEC*'s Subcommittee on International Exchange and Payments on September 9, 1968. Why the crawling peg and not freely flexible rates? As we shall see, Machlup provided an explanation in correspondence with Friedman in October 1968.

In his statement before the JEC subcommittee, Machlup repeated arguments made in his 1968 article for the *Financial Analysts Journal*: (1) to restore confidence in international reserves, it would be necessary to safeguard against "official switches" between gold and the dollar. This could be accomplished by "pooling all, or almost all, official holdings of both types of reserve assets ... [which would be] replaced by deposits with a conversion account ... of the International Monetary Fund" (1968b: 77), and (2) the dollar should not be devalued against gold because it would lead to global inflation (1968b: 79). Regarding the exchange rate regime, Machlup stated: "the Fund might adopt the device of 'band flexibility' of exchange rates, that is, a widening of the permissible margin of rate fluctuations from the present 1 percent to 3 or 4 percent above and below par. The best solution ... would combine the 'crawling peg' with the 'wider band' and allow the use of a 'movable band' of exchange rates" (1968b: 79).

What was the main issue that needed to be addressed at that time? Machlup continued to stress the confidence problem. He stated: "The most urgent is to avert the danger of having several billion of dollars of existing monetary reserves destroyed through the exchange of official dollar holdings for official gold holdings" (1968b: 79).

Machlup and Friedman, 1968-69. In the summer of 1968, Machlup, along with C. Fred Bergsten (U.S. National Security Council), George Halm (Tufts University) and Robert Roosa (Treasury Undersecretary for Monetary Affairs in the Kennedy administration) began organizing two conferences to deal with the issue of exchange rate flexibility. The aim was to bring together academics and practitioners from commercial banks and business firms – but not officials from central banks or government agencies. As co-organizer Halm (1970: v) put it: the "primary objective was to identify the major technical and policy issues that are raised by various proposals for greater exchange-rate flexibility." Two conferences were held, one in January 1969, in Oyster Bay, New York (with thirty-eight participants from eight countries) and the other in June 1969 (with thirty-eight participants – thirty-two of whom had participated in the first conference – from ten countries). Fifty-two papers associated with the conferences (several papers were written after the second conference) were published in a book, *Approaches to Greatest Flexibility of Exchange Rates: The Bürgenstock Papers*, edited by Halm. Among the participants were Fellner, Haberler, Johnson, and Sohmen. In describing the discussions that took place, Halm (1970: vii) wrote: "A majority [of participants] favored both widening the range (or 'band') within which exchange rates may respond to market forces, and permitting a more continuous and gradual adjustment of parities." Unlike Fellner's version (discussed above) of the crawling peg, the consensus Bürgenstock version did not include mandatory intervention at the edges of the band.

Machlup invited Friedman to the first conference but Friedman was not able to attend. Their correspondence sheds light on why Machlup favored the crawling peg regime and not freely floating rates, and why Friedman favored the latter. In a letter dated 11 October, 1968, addressed to Friedman, Machlup wrote:

> I am about to form another group. The time has come, we think, to make a more aggressive push toward greater flexibility of exchange rates. I believe that an increasing number of people in Congress and in the Treasury would like to give more favorable consideration to the 'band proposal." I know, this is a compromise,

> but it is probably the only strategy toward recognition of the advantages of flexible rates.

Friedman responded in a letter dated 23 October, 1968:

> I am delighted to hear that you are pushing on for greater flexibility of exchange rates. You may be right that the 'band proposal' is the only effective strategy. It probably is at a time when you do not have a crisis. I am still of the opinion that the way flexible exchange rates will in fact be most likely to be adopted is as a result of a widespread international liquidity crisis which leaves that as the only alternative open to the authorities.

Following the second meeting (in Bürgenstock), Machlup reported the outcome to Friedman in a letter dated 8 July, 1969:

> The Bürgenstock meeting was simply superb. We all learned a great deal. It was remarkable to observe the conversion of the practitioners. We had twenty representatives of large banks and international business. After a few days Francis Bator [Harvard] proposed a poll. To our amazement, only two out of the twenty practitioners voted for maintaining the present exchange system. The other eighteen favored a wider band, a gliding parity [*i.e.*, gradual adjustment of the central rate], or both. You will probably have guessed that the two conservative voters were Swiss.

Haberler, 1968-69. Like Machlup, in the late-1960s Haberler began to favor the crawling peg arrangement because he viewed it as a pragmatic compromise between the adjustable peg and freely flexible exchange rates. In a 1968 study, *U.S. Balance-of-Payments Policies and International Monetary Reform: A Critical Analysis*, co-authored with Thomas Willett (Harvard University), the authors wrote: "Generally, economists who favor freely floating exchange rates as the best solution prefer the compromise of limited flexibility" (Haberler and Willett 1968: 69). Haberler and Willett advocated a compromise under which "exchange rates would be allowed to vary within a certain range, say, 4 percent on each side of parity" (1968: 68). The central rate would be a crawling peg: "Under this arrangement, exchange rates would be slowly adjusted by a maximum of, say, 2 percent a year" (1968: 68). Although Haberler and Willett believed that flexible exchange rates are "far preferable to the adjustable peg system," they identified two potential problems with freely floating rates: they could be prone to "destabilizing speculation" and, unlike stable exchange rates, they could hamper international trade (1968: 67, 74).

As mentioned, following the U.S. presidential election in November 1968, Haberler chaired President-elect Richard M. Nixon's Task Force on reforming the international monetary system. The Task Force's report was titled *Report of the Task Force on U.S. Balance of Payments Policies*. Apart from Haberler, there were nine members, including Fellner and Willett.[44] The *Report* began: "There is growing consensus that our co-called 'adjustable peg' system has failed to provide the degree of flexibility in changing exchange rates envisioned by its founders at Bretton Woods" (Haberber *et al.* 1969: 2). The *Report* went on to note that "badly needed changes in exchange rates have become exceedingly difficult to achieve because ... under the exiting regime of rigid exchange rates any change in the international value of an important currency is a major operation with political overtones preceded and often followed by highly disturbing shifts of speculative funds" (1969: 29). The *Report* called freely floating exchange rates a "radical change," without, however, providing an assessment of floating rates. Thus, the *Report* called for "a middle ground which has recently attracted favorable attention in official and financial circles" (1969: 29, 30). That middle ground comprised two changes to the adjustable peg system. The first would be a widening of the band around the central rate:

> "This margin is now one percent each way, which is not enough to make a useful contribution to the adjustment process. By widening the band to say two, or three per cent each side of parity, and letting exchange rates fluctuate freely in response to market forces within the widened band a significant contribution to balance of payments adjustment would be achieved without scrapping the whole existing system" (1969: 30).

Implicitly, the middle ground assumed mandatory intervention at the limits of the band because intervention would be needed to keep exchange rates from moving beyond the edges of the bands while no intervention would take place within the bands.

The second change would be to allow "parities to change gradually in response to market trends" (1969: 31). The *Report* noted (without expressing a preference) that several ways had been proposed in the literature to achieve changes in central rates:

> One method would be to adjust parities automatically daily to a moving average of the market rate prevailing during, say, the preceding twelve months. Another would be to make mandatory a change of the rate by small steps, say, 2 per cent a year or one-sixth of one per cent a month, if it has remained for some specified time at the

[44] The other members were Arthur M. Becker, Tilford Gaines, Walter E. Hoadley, Hendrik S. Houthakker, Helbert V. Prochnow, Wilson E. Schmidt, and Henry C. Wallich (Haberler *et al.* 1969).

> upper or lower end of the band and had to be supported by the central bank. Such small rate adjustments unlike the big changes under the present system, would not give rise to massive flows of speculative funds because the inducement for such flows could be offset by suitable interest changes (1969: 31).

What about the convertibility of the dollar into gold? The *Report* took the view that, should foreign monetary authorities begin converting their dollars into gold "and a run on our gold stock develops, convertibility should be suspended before our gold stock declines very much below its present level" (1969: 9). In fact, five of the eight members of the Task Force, including Haberler and Fellner, preferred that the dollar be made immediately inconvertible into gold (1969: 9, fn. 2).

The *Report* was not optimistic that the global financial system would be able to avoid a crisis unless the reforms it recommended were adopted: "there is a distinct possibility, for which we ought to prepare that a crisis will occur at some time during the next Administration" (1969: 12). Not surprisingly, the *Report* was not published.

4.3 Friedman, Haberler, and Machlup, 1969

In December 1968, Friedman, Haberler, and Machlup participated in a Round Table on Exchange Rate Policy at the Annual Meeting of the AEA (held in Chicago), published in the May 1969 issue of the *AER*.[45]

In his remarks, Friedman recommended the following actions: (1) cessation of gold purchases or sales by the U.S. monetary authorities at the $35 per ounce or any other price; (2) elimination of all exchange controls and restrictions on capital movements; and (3) allow the dollar to trade freely in foreign exchange markets (Friedman 1969: 365-66). With these measures, and with a "reasonably stable and noninflationary" monetary policy, he argued, "the dollar would continue to be the major vehicle currency employed in international trade.... and New York will become in the final decades of the twentieth century what London was in the final decades of the nineteenth century" (1969: 366).

As in his Task Force's report, Haberler made the case for limited flexibility in exchange rates under a crawling peg based on four considerations. First, a "system of limited flexibility can cope with much more serious tensions and disturbances than the

[45] There were two other participants in the Roundtable: Peter Kenen (Columbia University) and Henry Wallich (Yale University).

present system of fixed exchanges." Second, flexible rates are undeniably much less prone to incite speculation "compared with the adjustable peg." Third, fixed rates give rise "to extensive controls" on trade "to protect the fixed exchange rate," hampering international trade. Fourth, flexible rates impose discipline on the monetary authorities; they provide "a clearer alarm signal" than do fixed rates (Haberler 1969: 359). It will be recalled that each of their arguments had been made by Friedman in the late-1940s and early-1950s. As for his preferred exchange rate system, Haberler favored the crawling peg "I believe that limited flexibility, a wider band, and more or less automatic adjustment of the band itself would be sufficient and probably preferable to unlimited flexibility" (1969: 358).

Machlup, who was the final Roundtable speaker, stressed the difference between "a flexible rate with official interventions in the foreign-exchange market and a 'floating' rate" (Machlup 1969: 367). He noted the differences in preferences between Friedman and Haberler: "Friedman prefers freely flexible rates, without any official interventions. Haberler recommends limited flexibility in the form of a wider band around a parity that is subject to slow, continuous adjustments. He is not specific on whether he would want authorities to intervene only when the limits of the band are reached or also within" (1969: 368). As for Machlup's preference, he stated:

> I would strongly argue that a wider band of exchange rates around a slowly crawling peg is for several countries -- not for all, of course -- a much more workable system than the present with the narrow band around a temporarily rigid peg that is abruptly adjusted when massive speculation makes its position untenable. I argue this chiefly on two grounds: (1) Speculative capital movements are much more likely to occur when one can make a gain of 10 percent over a weekend than when one can make at most 2 percent over a year. (2) The real adjustment process is set in motion by a small exchange-rate variation slowly, almost imperceptibly, yet years before it can start if the adjustment of the parity is delayed (1969: 369).

Thus, the wider band, Machlup believed, would reduce destabilizing speculation compared with the adjustable peg. Machlup had also come to believe that the exchange-rate variation under the crawling peg regime would provide more discipline on the monetary authorities than the adjustable peg: "a decline of the exchange rate of one's currency may be a more alarming signal for the authorities than a decline in official reserves" (1969: 368). Both these positions reversed the positions he had taken in the mid-1960s. Why, then, not a system of freely flexible rates rather than the crawling peg? As in his 11 October letter to Friedman, Machlup supported the crawling peg for a pragmatic reason: "the prejudices of the financial community against freely flexible rates are too strong to be overcome in the near future" (1969: 368). How would the rate of crawl of the central rate be determined? Machlup stated that the crawl could be set by "the automatic operation of a fixed formula ... [for example] by the average of the exchange rates of the past months" – that is, the crawl could be "dictated by the authorities" (1969: 368). Machlup did not express a preference. Nor did Machlup express a view on whether intervention would take place at the limits of the band or also within the limits.

4.4 Early-1970s

Friedman, 1971. Although Friedman had predicted the demise of the Bretton Woods system as far back as in the early-1950s, he did not foresee the 1971 crisis, which led to the measures announced by President Nixon on 15 August of that year. As mentioned, that crisis was provoked by a sharp deterioration in the U.S. balance of payments. In a letter dated 3 May 1971, addressed to George Shultz, who at the time was director of Nixon's Office of Management and Budget, Friedman wrote about the possibility of a crisis. After explaining that he had recently discussed the matter with several financial experts in two sets of meetings. Friedman stated that the discussions "strongly reinforced my own conviction that people are concerned about paper tigers, not real ones. On both occasions, the references were to competitive devaluations in the late 30's, to 'chaos,' to 'flight from the dollar,' and to similar rhetoric. In neither case was I able to uncover anything specific or anything frightening to justify the rhetoric."

Subsequently, in a letter dated 3 December, 1971, Friedman wrote to Secretary of the Treasury, John Connally about President Nixon's decisions on 15 August to impose the 10 percent surcharge on imports and to suspend convertibility of the dollar into gold. Regarding convertibility, Friedman wrote: "The President on August 15 did at long last what the U.S. should have done years ago: put foreigners on the same basis as U.S. citizens with respect to the dollar. The outcome in the exchange markets has been excellent. Flexibility has replaced rigidity. We do not need and should not seek specific commitments from other countries about exchange rates. What we must avoid is making any such commitments ourselves." Regarding the import surcharge, Friedman stated: "The one really bad feature of the present situation is the surcharge, which is harmful to us and threatens a trade war."

Connally responded in a letter dated 15 January, 1972:

> Events [i.e., the Smithsonian Agreement on 17 December 1971] have overtaken some the points expressed in your letter of December 3. The surcharge, which you deplore, has been removed. There is, and will be, greater flexibility for exchange rates to move in the future, although not to the degree you would wish.
>
> I did, as you know, offer at the International Monetary Fund meeting to remove the surcharge in return for clean floats. This offer was rejected and we cannot compel a clean float on the part of others or prevent them from pegging if they choose to do so. In these circumstances, we acted to encourage the maximum rate adjustment.

The following additional points about Friedman's views on exchange rates in the early-1970s deserve to be mentioned.[46] First, although Friedman opposed the 10 percent surcharge on imports, he came to view it as a de facto devaluation of the dollar, which, he believed, provided the Nixon administration with leverage in securing the agreement to devalue the dollar under the Smithsonian Agreement in December 1971. Second, in the aftermath of the Camp David measures in August 1971, Friedman did not foresee that a move to generalized floating would take place. Instead, he envisioned the prospect of unilaterally-set fixed exchange rates by U.S. trading partners against the dollar, occasionally interrupted by periods of floating rates so that balance-of-payments disequilibria could be relieved (Nelson 2020, vol. 2: 294). Third, during the turmoil in foreign currency markets at the beginning of 1973 and the decisions by policy makers in major European countries and Japan to float their currencies, Friedman (*Japan Times* 1973) came to the view that the world had taken "another step on the road toward freely floating exchange rates."

Machlup. On 26 December 1971, eight days after the announcement of the Smithsonian Agreement on international monetary reform, Machlup published an op-ed, "Flexibility Versus Fixed Exchange Rates" in the *New York Times*. He distinguished among four types of exchange rate systems: unaltering parities, jumping parities, gliding parities, and no parities. Machlup dismissed unaltering parities (permanently fixed rates) as "impossible" to achieve. He likewise rejected no parities (floating rates) "except for countries with rapid inflations". These eliminations left "a choice only between jumping parities (changed less frequently but more drastically) and gliding parities (changed more frequently but only a little)." After stating that, even if the new

[46] This paragraph is based on information provided in Nelson (2020, vol. 2, chap. 15).

parities with the widened (±2.25 percent) bands under the Smithsonian Agreement were "right," they "could [not] remain right for long," Machlup argued in favor of a system under which changes in central rates would not be "no greater than 2 or 3 percent a year, preferably in four or more small steps. A change in excess of 3 percent is regarded as a jump" (1971: 2).

Machlup's reason for supporting greater exchange-rate variation was based on the experiences following the changes in the central rates of the pound sterling, the Federal franc, and the deutsche mark in the late-1960s: "Never have the exchange rates of major currencies been more uncertain than in the period from 1967 to 1969, and never have they been changed more drastically.... Yet, the growth of foreign trade surpassed all previous records in these very years, and was most remarkable for exactly the countries whose exchange rates were so uncertain and so variable" (1971: 2).

In March 1973, Machlup published an article, "Less Rigidity is Not Enough" in *Euromoney*. The article was evidently written a short time before the flotation of European currencies that month since Machlup did not acknowledge that event. He continued to make the case for the crawling peg. His preference, he stated, had been for a band width of ±5 percent on either side of the central rate. Acknowledging that the Smithsonian Agreement had led to a widening of the bands to 4½ prevent (*i.e.*, ±2 ¼ percent from the central rate), he conceded that: "The battle of the band has probably been won." He continued: "The battle of the crawl or glide, however, has not yet been won" (1973a: 3). How could the rate of crawl, or what Machlup had come to call "speed limits to changes in rates" be determined? Without expressing a preference, he set down two kinds of speed limits or crawls: "a maximum variation for each single change and a maximum of cumulative change over any 12-month period" (1973a: 3).

Machlup then raised two questions about the speed of the crawl: "how much change per year and how much each time [a change was made]." He considered the first question to be non-controversial "most writers on the subject agree that a change in any 12-month period is small if it does not exceed 2 or, at most, 3 percent." As to the second question, Machlup stated that "the experts disagree. Some are willing to concede a limit of 1 percent for each individual change, others want the change each time to be limited to 1/26th of 1/25th of 1 percent." Machlup preferred the smaller adjustments:

> The ineffectiveness of tiny adjustments is exactly what appeals to me, because nobody can make any fuss about them. However, this is not a terribly important

> issue and I would be satisfied with one-tenth, one-fourth or even one-half of 1 percent as the maximum permissible change each time. I would prefer smaller changes, much below the cost of transactions, because they would be most unattractive to speculative movers of funds (1973a: 2).

The main advantage of his crawling peg scheme, according to Machlup, was that stabilizing speculation would be encouraged: "Whenever exchange rates come close to the upper or lower edge of the band, the probability of a return movement toward the center of the band is regarded as sufficiently high to invite transactions that actually induce such a movement of exchange rates away from the edge and toward the center of the band." Why would speculators anticipate a movement from the edges of the band back to the center? Machlup provided an answer that anticipated the future literature on target zones for exchange rates:[47] "Credibility of the rules is assumed," he stated (1973a: 3). In other words, the speculators believed that the monetary authorities would take the necessary actions at the edges of the band to move the market rate back towards the central rate.

A second article by Machlup in 1973 promoting the crawling peg was titled "Exchange-Rate Flexibility;" it was published in the September issue of *Banca Nazionale del Lavoro Quarterly Review* (hereafter, *Banca*). Evidently, that article was also written before the breakdown of the Bretton Woods system earlier that year since Machlup asked the following question: "Will there ever be an opportunity to try a system of free floating?" To which he replied: "the chances for an experiment are poor indeed. Under these circumstances it may be wiser to concentrate on selling types of flexibility that may be workable and appear saleable" (1973b: 205). Machlup presented four advantages of the crawling peg. (1) The widened bands would provide more room to conduct monetary policy for domestic reasons than a system with narrow bands. (2) It would accommodate temporary (seasonal and cyclical) changes in reserves without the need to adjust the central rate. (3) Provided that the markets trusted the authorities "to promote the adjustment mechanism with alertness and alacrity," interventions at the edges of the band would become "an exception rather that a rule." (4) A wide band would "accommodate small adjustments of parities without affecting the actual foreign-exchange rates prevailing in the market at the time" (1973b: 195).

[47] See Krugman (1991).

Fellner, 1973. With the breakdown of the Bretton Woods system in March 1973, temporary arrangements went into effect for "controlled floating" of currencies under which central banks would not intervene in the foreign exchange market to counteract sustained market pressure on the exchange rate, although they could intervene to prevent excessive volatility -- so-called smoothing operations. Against the backdrop of the controlled floating arrangements, in September 1973 Fellner published the paper, "Controlled Floating and the Confused Issue of Money Illusion" in *Banca*, Fellner acknowledged that, contrary to his view prior to that time, flexible exchange rates would not lead to destabilizing speculation.

Fellner began by noting a key difference between floating rates and the crawling peg regime: "The flexibility that has become introduced [under controlled floating] is not based on the conception of crawling pegs which had played a large role in [Fellner's] earlier writings; most varieties of the crawling peg would have required the setting of parity-rates between currencies under the aegis of the IMF.... We should cling to what we [now] have and recognize its implications. Under controlled floating parity-rates between currencies have no justification ... and hence the aegis of the IMF is not needed for this purpose" (1973: 209).

What caused Fellner to now favor a floating regime instead of the crawling peg? As indicated above, the experience with controlled floating had convinced him that those whom he called the "theorists" -- presumably including Friedman, Johnson, and Sohmen -- who had been advocating flexible rates were right after all: floating rates encourage stabilizing speculation: "The ideas of 'theorists' many of whom had been urging greater flexibility for a long time are proving less 'impractical' than has so often been alleged in the course of the debate, though it should be stressed that the learning process has very definitely been a mutual one between the members of the economics profession and the practitioners" (1973: 215).

Fellner's conversion to the view that floating exchange rates encourage stabilizing speculation was based on the experience under controlled floating. That experience also convinced him that a flexible exchange rate system is very different from the crawling peg. Effectively, under flexible exchange rates speculators speculate against speculators instead of against governments. Fellner stated:

> What is more important, it still would be true that relatively small rate-movements frequently put an end to a wave of speculation in the currency markets, since

> speculators have to bear the risk of a reversal of these movements, while under a Bretton Woods type system ‘attacking’ a suspect currency is not a particularly costly operation. Wider bands help in this regard even in a Bretton Woods type system but it is a piece of tautology to say that with sufficiently wide bands such a system becomes practically indistinguishable from one of floating. Referring to the recent experience ... none-too-large movements of floating currencies with little central-bank activity in a period of American internal political difficulties which in the preceding era would have resulted in a massive attack on the dollar - a German official made an apt remark in conversation. Nothing very bad happened, he said, because *speculators had to speculate against speculators*; they were no more in a position to speculate against official agencies committed to fixed rates until forced to abandon them (italics in original, Fellner 1973: 218-19).

Haberler, 1973-74. In a 1973 paper “The Dollar-Mark-Yen Crisis, 1973,” Haberler assessed the developments that took place at the beginning of 1973. He expressed the view that the adjustable peg was not a sustainable exchange rate system because it offered “an easy target for the speculator” (1973: 3). The “only effective way” to avoid currency crises, he argued “is to stop pegging and let the exchange value of a currency float, that is to say, to let it be determined by demand and supply in the market” (1973: 3). Haberler did not expect floating rates to become generally adopted: “Will floating become general? I doubt it” (1973: 5).

The following year Haberler had changed his view. In a 1974 paper, “The Future of the International Monetary System,” Haberler opined: “Floating is here to stay for an indefinite future” (1974: 393). But what kind of floating? He distinguished between managed floating, under which “the interventions of the monetary authorities consist merely of buying and selling currencies in the market so as to iron out shortrun fluctuations,” and a system under which “the authorities should completely abstain from intervening in the exchange market” (1974: 394). Haberler thought that the latter type of floating was most unlikely. He added: “I am not too much disturbed by that prospect” (1974: 395). In neither of his 1973 or 1974 papers did he refer to the crawling peg.

Triffin, 1973. We close our survey of the views on exchange rate regimes of the members of the Quartet and Friedman with a prognosis made in 1973 by Triffin. In a 1973 paper, “The Collapse of the International Monetary System: Structural Causes and Remedies,” he did not take pleasure in the accuracy of his prediction about the breakdown of the Bretton Woods system because he was unhappy about the successor regime to the adjustable peg. He stated:

> Professor Milton Friedman has finally had his day, or rather his week. His long-standing advice has been followed - reluctantly, it must be admitted, rather than joyfully - by all major central banks. They stopped, on March 2, their interventions in the exchange market and let exchange rates float freely in response to market forces.
>
> I strongly suspect, however, that Milton Friedman's 'millenium' will not last for a thousand years, nor even for a thousand days. I shall not venture to predict, however, what remedies, or stopgaps, will be adopted by our national monetary authorities in the days and weeks ahead. All I can confidently assert is that they don't know themselves what they will be willing and able to achieve, in order to reassert a leadership that they have utterly lost, and to carry out their responsibilities for the restoration of a viable monetary order (1973: 362).

5. Assessment and Concluding Remarks

The Bretton Woods system was built on a foundation that included the commitment by the United States to convert the dollar into gold with foreign monetary authorities at the fixed price of $35 per ounce. As doubts began to emerge in the early-1960s about the ability of the United States to honor that commitment, the members of the Quartet, both individually and collectively, embarked on ways to reform the Bretton Woods system that would make it durable. The following conclusions emerge from the above discussion.

1. The view, long held in the literature on exchange rate regimes, that Quartet members Haberler, Machlup, and Fellner were proponents of freely flexible exchange rates during the Bretton Woods years is inaccurate.
2. In the 1940s, Haberler was a proponent of the adjustable peg. He became an advocate of flexible exchange rates in 1953 and, especially in 1954, publications. The practical reason underlying the switch was Haberler’s perception that the Bretton Woods adjustable peg had been a failure. The intellectual arguments underlying the switch had been made earlier by Friedman, whose views appear to have influenced those of Haberler.
3. In the early-1960s, Haberler backtracked from his earlier support for flexible rates. He believed that the United States had to honor its commitment to buy and sell gold at the $35 fixed price in transactions with foreign monetary authorities. In line with the rules of the game under the adjustable peg, he saw

scope for revaluations of the currencies of current-account-surplus countries against the dollar.

4. In the early-1960s, all of the members of the Quartet thought that, among other things, flexible exchange rates encourage destabilizing speculation, hamper international trade, and contain an inflationary bias (*i.e.*, they provide less discipline than the adjustable peg). Triffin, in addition, believed that flexible rates would lead to a depreciation bias due to resistance to downward cost and wage adjustments. Triffin was a staunch opponent of flexible exchange rates throughout the 1960s and early-1970s.
5. In the first half of the 1960s, Machlup's efforts at global monetary reform focused on ways to improve liquidity provision. His views were strongly influenced by those of Triffin. Like Fellner, Machlup began to focus on the exchange-rate-regime issue rather late in the day. Into the mid-1960s, Machlup thought that flexible exchange rates contain an inflationary bias and hamper international trade.
6. From the mid-1960s until the early-1970s, Fellner, Haberler, and Machlup were proponents of limited exchange-rate flexibility under the crawling peg. Haberler advocated the crawling peg regime in his capacity as chair of President-elect Richard Nixon's task force to reform the international monetary system. He favored widened bands (±4 or ±5 percent) around the crawling peg, and intervention at the margins of the bands.
7. The views of Haberler, Machlup, and Fellner on the exchange rate system in the late-1960s reflected the practical consideration that the crawling peg would likely be more acceptable to monetary authorities and market participants than floating rates. Apparently, the crawling peg enjoyed widespread support in the late-1960s among both academic economists and market practitioners, as discussed by Halm (1970).
8. Fellner, Haberler, and Machlup envisioned a central rate that would crawl – it would move in small steps – during the course of each year. None of those economists endorsed a particular method of crawl. Instead, they discussed *possible* ways to implement the crawl – for example, 1/6 of 1 percent a year, or a moving average of the market rate in the previous twelve months (Haberler), or a change of 1/25th or 1/26th of 1 percent each time a change was made, or a fixed (unspecified) formula "dictated" by the authorities (Machlup). Each of the

proposed crawling methods was arbitrary and, in some cases, backward looking. Each was incapable of dealing with unexpected events that could alter not only the past weights, but the direction of change – for example, the French strikes in mid-1968 that changed the position of the franc from a candidate for appreciation to a currency that was devalued one year later.

9. In contrast to the flexible exchange rate system envisaged by Friedman, and also contrast to the present system among the largest economies, the crawling peg involves a large element of government decision-making: the government determines the central rate, the direction of the crawl, the rate of crawl, the width of the bands around the central rate, and the parameters determining the timing and amount of foreign exchange intervention.
10. Both Friedman and Triffin foresaw the breakdown of the Bretton Woods system, but for different reasons. Friedman considered that the adjustable peg was subject to one-way bets by *private speculators*, ensuring the system's demise. Triffin viewed the system as subject to confidence crises within the *official sector* as foreign governments attempted to convert their dollar holdings into gold held by the U.S. monetary authorities.
11. Following the move to generalized floating in 1973, Haberler, Machlup, and Triffin expressed doubts about the durability of a floating rate regime.

In conclusion, Bordo (1993: 37) observed that the Bretton Woods system that emerged after World War II was far different from the system that the architects of the system envisioned; likewise, the system of exchange rate flexibility that emerged after the breakdown of the Bretton Woods system was far different from the system that the architects of the crawling peg envisioned.

Appendix A

The Quartet: Dramatis Personae

William J. Fellner (1905-1983). Fellner was born in Budapest and received his Ph.D. in economics from the University of Berlin in 1929. His student, Irma Adelman, wrote that in the 1930s Fellner "had been traumatized by the German hyperinflation, the mass unemployment of the Great Depression, and by the Nazi totalism which ensued" (1987, vol. 2: 301). Fellner moved to the United States in 1938 and joined the economics faculty at the University of California at Berkeley that year. He remained at Berkeley until 1952, when he moved to Yale. After retiring from Yale in 1973, he joined the American Enterprise Institute (in 1975). He was President of the American Economic Association in 1969 and was a member of the President's Council of Economic Advisors (1973-75).

Prior to the 1960s, Fellner's works focused on macroeconomic analysis and policy in the domestic economy. He advocated expansionary monetary and fiscal policies at the first sign of recession but thought that the stimulus should be removed at the first sign of inflationary pressures, not when a full employment target is met (Marshall 2006: 265). His later work emphasized the roles of uncertainty, expectations, and the credibility of policy commitments: he developed the idea that the private sector would inevitably figure out the effects of inflationary policies, negating the effects of those policies, thus foreshadowing future work on credibility and inflation (Adelman 1987: 301).

Gottfried Haberler (1900-1995). Haberler was born in Purkersdorf, near Vienna. He studied at the University of Vienna, where he received doctorates in law (1923) and economics (1925). He was Professor of Economics at the University of Vienna from 1928 to 1936. He joined the economics faculty at Harvard University in 1936; he remained at Harvard until his retirement in 1971, when he joined the American Enterprise Institute. Haberler was President of the AEA in 1963.

Haberler's most significant contribution in the field of international economics was his reformulation of the theory of comparative costs which "revolutionized the theory of international trade" (Chipman 1987a: 581). What Haberler did was to pioneer the discovery of the production possibility frontier (or opportunity cost locus), allowing for several factors of production – multi-factor technologies with land, produced capital goods, and heterogenous categories of labor inputs (Willett 1982; Chipman 1987a: 581;

Samuelson 1996: 1681). Haberler also made major contributions to the theory of price indices and business cycle theory.

Fritz Machlup (1902-1983). Machlup was born in Wiener, Neustadt, then in the Austro-Hungarian Empire. He obtained his Ph.D. at the University of Vienna in 1925. He moved to the United States in 1935 teaching at the University of Buffalo (1935-1947). He then taught at Johns Hopskins University (1947 to 1960) and Princeton University (1960 to 1971). Upon retiring from Princeton University, he resumed an active career, teaching at New York University until his death. He was President of the AEA in 1966.

Prior to the 1960s, Machlup's two main areas of research were industrial organization and international monetary economics. In the former area, he developed a formal theory of invention, innovation, and the optical lag of information following innovation. In the latter area, his work was mainly theoretical, including contributions to the supply of, and demand for foreign exchange and the limitations of Keynesian multiplier approach to international finance. In the 1960s, he turned to international monetary reform (Chipman 1987b: 267; Langlois 2006: 589).

Robert Triffin (1911-1993). Triffin was born in Belgium. He received his Ph.D. at Harverd University in 1938 and taught at that institution until 1942. During the 1940s he held positions at the Federal Reserve (1942-1946), the IMF (1946-1948), and the U.S. State Department (1948-1951). In 1951, he became a professor of economics at Yale University, where he taught until 1977. In addition to his formulation of the Triffin-dilemma thesis, discussed in the text, he played a key role in the construction of Economic and Monetary Union in Europe (Maes with Pasotti 2021).

Appendix B

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