Triffin Dilemma and Regional Monetary Approach: An appraisal

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Abstract

Robert Triffin (1960) was the first to formalize that, under the gold exchange standard, the key currency issuing country faced a dilemma. Either the United States would stop providing more dollar balances for international finance, leading to trade stagnation and deflationary bias in the global economy; either the United States would continue to provide more of the international reserve currency, leading ultimately to a loss of confidence in the dollar. This paper shows that the formulation of this dilemma is the consequence of Triffin's early critics of the Bretton Woods system in the 1940s leading him to advocate a reform of the international monetary system at the regional level, ie. the European one, in the 1950s.

Keywords: Bretton Woods, clearing mechanism, European Payments Union, International Monetary Fund, international money, Triffin.

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1. Introduction

This paper focuses on Robert Triffin's critics of the Bretton Woods system and his proposals to reform it at the regional level in the 1940s and in the 1950s. Triffin (1911-1993) is traditionally associated with his famous 1960 book, *Gold and the Dollar Crisis*, in which he diagnoses the instability of the gold exchange standard centralized around the gold convertibility of the dollar. This diagnosis, known as the Triffin dilemma[2], is as follows: if the United States (thereafter US) leaves to deteriorate its net reserve position – difference between gold holdings and dollar balances held by foreigners – the confidence in dollar balances would break down. On the contrary, if the US limits the provision of dollar balances to avoid a crisis confidence, international liquidity would be scarce, limiting world trade expansion and leading to world deflation. The liquidity crisis forecasted by Triffin occurred in August 15, 1971 when the American President, Richard Nixon, was forced to suspend the gold convertibility of the dollar. The traditional literature, as Allan H. Meltzer (2009: 221) or Barry Eichengreen (2011: 71), analyzed the formulation of the dilemma by Triffin as the consequence of the growing role that the dollar had in the international monetary system since the 1950s. Drawing a picture of the state of, and prospects for, international liquidity, Triffin (1960: 61) stated that large demand for international reserves would only be covered by an increase in dollar balances weakening the net reserve position of the US. This literature is relevant since it shows how the dollar glut got Triffin to realize the inconsistency of the gold exchange standard. Nevertheless, this literature seems to lead to a misunderstanding of the origins of the Triffin dilemma. This paper intends to show that Triffin's critics of the Bretton Woods system came before the situation of dollar glut in the late 1950s, leading him to formulate concrete propositions for European monetary integration to escape the dilemma.

Triffin's formative and first professional experiences are of importance to understand his carrier as an economist and policy adviser. Born in Belgium, under graduated in economics at the University of Louvain in 1935, Triffin studied economic cycles theory under the aegis of Léon H. Dupriez, a Harvard-trained economist, who introduced a statistical method to test business cycle theory in Europe. In the line of this tradition, Triffin published two works criticizing Cassel's purchasing power theory[3], stressing the necessity to distinguish the structure of prices in a country – prices of raw materials or finished products but also

[2] It was not Triffin but Oscar L. Altman (1961: 164) who first used the term "dilemma".
[3] "*Les mouvements différentiels des prix de gros en Belgique de 1927 1934. Calcul et interpretation d'indices de groups comparables"* (1935) and *"La théorie de la surévaluation monétaire et la devaluation belge"* (1937).

industrial and agricultural goods that were imported and exported – in order to understand the balance of payment adjustment mechanism. In 1935, Triffin went to Harvard to achieve his PhD dissertation, under Schumpeter's direction and Leontief and Chamberlain's guidance. Far from his first empirical works, Triffin made a dissertation on *General Equilibrium and Monopolistic Competition*, defended in 1938. In 1942, he was hired as Chief of the Latin America section of the Board of Governors at the Federal Reserve System in Washington. This opportunity to join an American administration was a turning point in Triffin's career because he abandoned pure theory in favor of monetary and policy-oriented economy. Between 1942 and 1946, Triffin became a money doctor and was sent to Latin American countries at a time when the money doctoring orthodoxy was replaced by a new form of thinking national and international adjustment mechanism in southern countries[4]. Ivo Maes (2013) highlights the continuity of Triffin's thinking on "the vision that the international adjustment process was not functioning according to the classical mechanisms" (ibid: 1145). This consistency throughout Triffin's career, pointing out the discrepancy between the economic theory and the facts, provides a better understanding of his analysis of the gold exchange standard instability. However, we consider this analysis as incomplete. A way to complete the analysis of the origins of the formulation of the Triffin dilemma is to focus on his earlier critics of the Bretton Woods system in the second half of the 1940s. Indeed, in 1946, Triffin became Director of Exchange Control at the International Monetary Fund (thereafter IMF) at a time when the young Bretton Woods institution did not succeed in providing a system for clearing bilateral balances that were not fully convertible. According to Triffin, because countries were not prepared to trade on dollar-convertibility, bilateralism and trade and exchange restrictions were commonplace in the immediate postwar years. As a remedy, Triffin made reform proposals to cope with the structural IMF's inability to eliminate exchange restrictions on current transactions and to outlaw bilateral payments arrangements. In a September 1947 IMF memorandum, entitled *The Unresolved Problem of Financing European Trade*, Triffin advocated for a European clearing union, similar to Keynes's International Clearing Union, aiming at fostering European trade and economizing international reserves. In July 1948, the IMF opened an office in Paris and Triffin was appointed as its first official head. In 1949, the US government asked Triffin to join the staff of the Economic Cooperation Administration – which administrated the Marshall Plan – to

[4] According to Eric Helleiner (2003: 249), "in place of currency boards and the gold standard, they [Latin American countries] introduced capital controls, more flexible exchange rates, and powerful national central banks designed to serve the domestic goals of rapid industrial development and nation-building".

help in the drafting and negotiation of an agreement based along the lines of his previous IMF memoranda. Triffin succeeded in promoting such a plan since it will give rise to the European Payments Union (thereafter EPU) in 1950. The success of such an institution during the 1950s strengthened Triffin's belief to call into question the architecture and functioning of the Bretton Woods system, stressing that an international monetary system centralized around the US currency and policy did not foster its flexibility and stability[5]. Actually, the formulation of the Triffin dilemma in 1960 was the consequence and not the cause of Triffin's involvement into broader regional monetary integration.

Our analysis will be on double level: the first level is more theoretical and shows that only three years after the 1944 Bretton Woods negotiations, the debate on the nature of the international monetary system carried on. The second level, historical, concerns the way that Triffin constantly underpinned his view of a regional monetary integration to make proposal for a reform of the international monetary system. Throughout our analysis, we will highlight that the international liquidity issue – its use, its provision and its composition – was at the core of Triffin analysis when he questioned the ability of the gold exchange standard to make compatible the conduct of discretionary national economic policies and the respect of balance of payments equilibrium. The second section deals with Triffin's critics in the 1940s of the supposed working of the international gold standard. Indeed, Triffin attempted to highlight the discrepancy between the theory and the facts, questioning the automatic and symmetric features of such a system. In that way, Triffin pointed out the necessity to have a flexible international monetary system in the supplying of international liquidity to enable countries to conduct counter-cyclical monetary policies. The third section examines Triffin's first proposal for a European clearing union in order to promote trade liberalization and provide international liquidity. Triffin is known as the EPU's architect and we will reinforce this assertion by a comparative analysis between his proposal made in his 1947 IMF memorandum and the 1950 EPU. The fourth section is devoted to present the Triffin dilemma in the light of the analysis previously offered. We will concentrate our attention on Triffin's continuous involvement into a deeper regional monetary integration in order to cope with the inconsistency of the Bretton Woods system.

[5] This idea was suggested by Guido Carli, former President of the EPU and Governor of the Bank of Italy: "(…) it is probable that Triffin's close involvement with and understanding of the EPU led to his early diagnosis of the ills that would eventually undermine the system of stable but adjustable exchange rates based on the dollar as the primary reserve asset" (1982: 167).

2. A case for a more flexible International Monetary System (1942-1947)

Drawing on his experience at the Fed and the IMF, Triffin questioned the gold standard theory when the Bretton Woods system aimed at reconciling the autonomy of national economic policies with a fixed but adjustable exchange rates framework. He strongly objected to the orthodox view of adjustment mechanism explaining that such a view led to fallacies in the conduct of monetary policies.

2.1 Criticism of the Orthodox View of Gold Standard Operation

In a 1947 article, entitled *National Central Banking and the International Economy,* Triffin gave a streamlined picture of how the international gold standard was supposed to operate before 1914, based on the hypotheses of automatism and symmetry of the adjustment mechanism. According to him, this orthodox view ascribed balance of payments disequilibria to domestic price and cost levels, and interest rates disparities between countries. A sharp difference between the rise in price level in a country compared to the rest of the world will both stimulate country's imports and discourage its exports. The deficit in the balance of trade is accompanied by a contraction of the national money supply (Triffin, 1947a: 47). So the automatic adjustments rely on market forces and could be reinforced by central banks policies (Triffin 1947a: 52). Indeed, following the orthodox rules of the gold standard, monetary authorities of deficit countries could use the discount rate and open market operations to tighten credit, accelerate the readjustment of domestic prices and restore the balance of trade equilibrium.

To sum up, the orthodox thinking left no room to monetary management by central banks and focused on the automatic and symmetric features of the adjustment mechanism. Tiffin wrote that this thought pattern "inspired so much of the academic thinking and legislative controversies regarding national and international monetary mechanisms during the nineteenth and even the twentieth century" (1947a: 49) while it offers an unrealistic description of the gold standard operation.

Firstly, Triffin was very critical of the automatic feature of the adjustment mechanism. Indeed, Triffin considered that monetary authorities were not such as passive as the theory supposed. Indeed, before 1914, central banks prevented the major degradation of the balance of payments by raising the discount rate. In other words, the disequilibrium of the balance of payments was corrected *ex ante* by monetary authorities' intervention instead of *ex post* through a decrease in quantity of money giving rise to a fall in income and price level. Moreover, Triffin dismissed the argument whereby the equilibrium of the current account was restored thanks to price readjustment. In *Gold and the Dollar Crisis* (1960: 26), he stressed on the remarkable work made by Taussig and his students in the 1920s dealing with the role of international borrowings to explain the international gold standard operation before 1914. Thanks to capital exports from the core to the peripheral countries, repeated year after year, current account disequilibria were perpetuated and financed and did call for residual correction by deficit countries.

Secondly, Triffin rightly raised the limits of the symmetrical analysis in the orthodox framework: disequilibria were always analyzed between one country with the rest of the world. It was supposed that the world was made up of homogenous countries and the perturbations were domestic and not worldwide.

> The most cursory examination of statistical data clearly shows that many of the most spectacular disequilibria in balance of payments are *worldwide* in scope, and must be traced to cyclical fluctuations of an international character rather than to national price and cost maladjustments. (italics in the text, Triffin, 1947a: 55-56)

According to Triffin, the economic cycles were global and did not result from domestic disequilibrium because of the existence of an asymmetry between the core countries – industrial and capital exporting countries – and the peripheral ones – the raw material and primary goods producing countries that import capital from the core. Triffin added that "for many agricultural and raw material countries, the international cycle is mainly an imported product " (1947a: 60), pointing out the hierarchical structure of international finance, centralized around the creditor position of Great Britain. Indeed, considering the leading position of London as an international financial center, the orthodox theory did not succeed in describing the adjustment mechanism for a country like Great Britain, nor the way that global cycles originated from changes in British discount rate. The international gold standard was in fact a gold-sterling exchange standard whose the leader was the Bank of England. In order to respond to domestic goals (stabilizing domestic prices and making money market more liquid), the Bank of England conducted monetary policy by controlling domestic credit. But changes in its monetary policy impacted the financial conditions of foreign countries because their bills were contracted in London in order to finance international trade. In the line of Ralph G. Hawtrey[6]'s diagnosis (1919), Triffin stated:

[6] As highlighted by P-H Rojas (2015: 3), Hawtrey stated that "the nineteenth century credit system is not to be interpreted as consisting of a number of countries each exercising independent control over credit within its own

> To a very large extent, increases in the London discount rates brought about a readjustment in the British economy, but through their effects on the outside world and especially on the agricultural and raw material countries. (1947a: 59)

> The failure of British discount policy to effect the type of readjustment contemplated in classical theory (…) was due primarily to the *international* character of the London discount market, whose expansion and contraction affected foreign prices as much as or more than British prices. (Triffin, 1947a: 62-63)

The contraction of international credit, understood as British credit, not only deprived British demand for goods but also international demand tending to decrease foreign prices. The burden of the domestic adjustment in foreign countries was all the more heavy that the rise in the British discount rate attracted capital flows, reinforcing balance of payments difficulties for peripheral countries. Moreover, given the supply and demand conditions of primary goods and raw materials, peripheral countries' exports were strongly affected when world demand felt.

> They [peripheral countries' exports] are largely determined by international rather than domestic factors. Major fluctuations in export values are largely the result of cyclical movements in economic activity and income in the buying countries (1947a: 57)

On the contrary, as a financial center, Great Britain was able to improve its terms of trade – domestic prices relative to foreign prices – and attract short-term capital to restore disequilibrium of its balance of payments but at the price of cyclical disturbance in peripheral countries. In other words, the burden of deflationary process in Great Britain was avoided thanks to the international impact of the British monetary policy. However, in peripheral countries, whose the core countries financed the economic activity, "capital tended to flow toward them in times of prosperity and away from them in times of depression, irrespective of their discount policy" (Triffin, 1947a: 60). The orthodox remedy was to lead deflationary monetary and fiscal policies. Understanding that balance of payments disequilibrium did not result from price and cost levels disparities but from world cycles, Triffin called for a revision of orthodox remedy.

2.2 The Advocacy for Counter-Cyclical Monetary Policies

Triffin strongly advocated heterodox policies – understood as different than the orthodox rules of the game policies – for the first time when he was at the Fed between 1942 and 1946.

limits, and being led by the influence of gold movements to accommodate its credit policy to that of the others. It is rather to be regarded as a centralized system responding to a leader. The center was London and the leader the Bank of England" (Hawtrey, 1929: 70).

During these years, he was a money doctor in Latin American countries such as Honduras or Paraguay. Originally, the money doctoring missions led by US officials in those countries used to set up rigid monetary systems, such as currency board or gold exchange standard. The leading figure of these policies was Edwin W. Kemmerer (1875-1945) who was committed to set up a gold exchange standard in these peripheral countries because they could not support the heavy cost of holding metallic reserves for internal and external circulation (Rebeca Gomez Betancourt, 2008: 230-235). In Kemmerer's view, monetary policies in gold exchange standard countries could be exclusively oriented towards the stability of exchange rate with the mother country's currency, i.e. the US dollar. According to Helleiner (2003: 255), the US policy makers' stance evolved during the 1930s. Following the demise of the international gold standard in 1931 and the effects of the Great Depression in the 1930s, the US officials from the Treasury and the Fed became aware of the vulnerability of the southern countries' economies, most of them being agricultural and suffered largely from volatile capital flows. They considered that orthodox policies "magnified – rather than minimized – the impact of international instability on the domestic economy in this context" (Helleiner, 2003: 251).

Triffin' thought on policy design was deeply influenced by this new American view on foreign economic policy. According to Helleiner:

> In contrast to the Kemmerer missions, US officials in the 1940s also went out of their way to draw upon, and learn from, Latin American expert views, and to adapt their advice to the distinctiveness of each country's circumstances and needs. (2009: 4)

Indeed, Triffin insisted on the fact that peripheral countries' specificities differed from those in the core countries. Their financial and banking system were not so developed making difficult to follow the gold standard policies consisting in controlling the money supply through the discount rate policy and open-market operations. Moreover, foreign banks financed development in peripheral countries, making the latters strongly dependent of capital flows from financial centers. In case of external disequilibrium in a peripheral country, the orthodox rules of the game policies strengthened domestic instability.

> (…) The classical prescription for remedial policy becomes as misleading as the diagnosis on which it is based. Deflationary efforts at readjustment by individual countries are largely self-defeating because they aggravate the depression rather than cure the disequilibrium. Any initial success that they may have in curbing imports or expanding exports aggravates the difficulties in their supply and exports markets as well as in competing countries, and leads to similar and mutually offsetting measure of defense or retaliation. (Triffin, 1947a: 57)

To avoid this, peripheral countries "should attempt to offset [disequilibria] to the largest possible extent by domestic compensatory policies" (Triffin, 1947a: 64). According to

Helleiner (2003), Triffin advocated the establishment of central banks, able to manage the monetary and banking system, especially by releasing the rigid link between legal tender money/deposits and international reserves (gold and foreign exchange)[7].

Not only peripheral countries had to promote a form of monetary management that insulated the national economy from international disruptions, but also the core countries had the responsibility to smooth worldwide fluctuations. Since the cyclical disturbances originated from their leading position in the international finance, the core countries had to follow a new set of economic policies stabilizing purchasing power of money and income. On that topic, Triffin was clear:

> The only satisfactory corrective of cyclical disequilibria in the balance of payments which are not due to fundamental maladjustments in international price levels thus lies for most nations, not in internal deflation according to the "rules of the game" recipe, but in *the restoration of economic activity and purchasing power in the centers of the cyclical disturbance* (italics mine). (1947a: 64)

However, gold exchange standard countries would have to resort to international reserves, such as gold and foreign exchange, to cope with worldwide fluctuations in economic activity if they want to preserve domestic stability. Indeed, if a country met balance of payments difficulties, monetary authorities had to meet large demand for foreign currency. Since the country did not decide to impact national income and price level by tightening domestic credit, the depletion in international reserves could lead to liquidity difficulties and exchange crisis. Triffin was conscious of that problem, noting that the general adoption of counter-cyclical monetary policies "would tend to amplify the instability of national reserves of gold and foreign exchange" (1947a: 64). That's why this kind of policies "requires a high level of international reserves (…) and the willingness to spend these reserves liberally in times of crisis (…)" (Triffin: 1947a: 80).

Triffin strongly advocated a general revision of the way of thinking the international gold standard operation and monetary policies design. This process was the result of Triffin's career both at the Fed and the IMF[8]. According to Triffin, the working of the international

[7] As developed earlier, this set of ideas was not so new when we analyze the American monetary thought in the 1930s, especially at the US Treasury. Like Triffin, Harry D. White, one of the architects of the Bretton Woods system and member of the US Treasury, was deeply involved in these kind of recommendations for US economy during the 1930s, such as control of capital flows or changes in reserve requirements, in order to manage the monetary and banking system (Rojas, 2015). Helleiner (2014: 86) showed that White was also committed in this new approach of money doctoring in Latin American countries, leading missions in Cuba in the second half of the 1930s.

[8] Later Triffin reminded about his 1947 article: "I attempted to integrate the lessons which I had learned in the process into a broad reinterpretation of the classical theory of the gold standard and some highly unorthodox policy advice for the newly born International Monetary Fund on the then burning issue of exchange controls"

monetary system had to be more flexible with an architecture that provided sufficient amount of international reserves to enable countries to cope with world-wide perturbations.

3. Triffin's Advocacy for European Monetary Integration (1947-1950)

In the previous section, we analyzed the reason that Triffin legitimated the use of international reserves for deficit countries. In this section, we point out another complementary issue: the provision of that international liquidity. Did the Bretton Woods system provide a multilateral payments system and set up a financial mechanism to meet countries' needs in case of balance of payments disequilibrium? It did in principle since the innovation of the Bretton Woods system was the establishment of the IMF whose aim was to provide resources for deficit countries. But immediately after the end of the war, the Bretton Woods system seemed to be unable to guarantee its objectives, that is to say "to facilitate the expansion and balanced growth of international trade" (Article I, Section I of the IMF Articles of Agreement) and "to assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade" (ibid, Section IV). In time of international liquidity scarcity and absence of current account convertibility between countries, Triffin developed an original approach of European monetary integration – a clearing mechanism to settle balances at the European level – to get rid of bilateralism and exchange and trade restrictions.

3.1 Bilateralism and liquidity shortage: the IMF's failure

In theory, the gold exchange standard established during the Bretton Woods negotiations coupled with the policy of the IMF guaranteed more flexibility in the provision of international reserves. According to Triffin (1947a: 80), "when reserves are insufficient, foreign or international assistance – such as is contemplated under the International Monetary Fund – will be necessary". This assistance would both provide reserves for deficit countries without resorting to internal deflation or exchange control and protect other countries from being impacted by the effects of theses measures. So the IMF was framed to oversee the

(Triffin, 1966: 141). Moreover, the influential role of Raúl Prebisch on Triffin during the 1940s has to be emphasized. About his work in the international gold standard in the 1940s, Triffin wrote: "I would like to take this occasion to stress anew my indebtedness to Dr. Raúl Prebisch's pioneering work in the same field" (1966: 141).

international monetary system and smooth countries' external adjustment. But in practice, the economic environment in which the IMF was supposed to intervene was far different from the immediate post-war period. Indeed, the theoretical framework considered by the IMF was an equilibrated structure of international payments, with full currencies convertibility, stable exchange rates and none exchange and trade restrictions. Actually, post-war environment was far from this moot representation. Firstly, exchange and trade restrictions outlasted the end of the war and countries were not encouraged to reduce them without knowing the policies followed by other countries. Secondly, currencies inconvertibility lasted until 1958 forcing countries to use the only convertible foreign currency, i.e. the US dollar. Thirdly, following the destruction of European industry and the growing needs for capital and consumption goods, European countries ran a structural current account deficit with the US until the mid-1951. According to Eichengreen (1993: 11), this deficit amounted to $5.6 billion in 1947, $3.4 billion in 1948 and $3.2 billion in 1949.

Why was the IMF unable to solve this general disequilibria according to Triffin? First of all, the IMF was framed to deal with an isolated country and no provision was made for a system of multilateral clearing of credit and debits balances. In case of balance of payments disequilibrium, countries' members could borrow from the IMF a foreign currency in exchange of its own in order to settle a deficit with a particular country[9]. Countries were not able to use their earnings with a country, with which it runs a surplus, to finance their deficits with others. In absence of a clearing mechanism to settle bilateral balances between countries, countries were forced to repaid their debt to the IMF in gold or in foreign currency. Triffin (1952) reminded that:

> The maintenance of a bilateral framework for international payments ensured automatically the persistence of a rigid bilateralism in the administration of trade and exchange restrictions. Each country would have the strongest incentives to discriminate against its creditors – to avoid gold payments beyond the credit margin – and in favor of its debtors – to avoid the accumulation of frozen credits, or the adoption of discriminatory restrictions against its own exports. (Triffin, 1952: 273)

Actually, Triffin pointed out the core issue of the Bretton Woods negotiations. While Keynes supported an International Clearing Union in which deficit balances would be automatically financed by credit on the International Clearing Union books, White was much less ambitious. Indeed, under White's plan, members could acquire from the International

[9] Each country could borrow from the IMF up to an amount limited by its quota. IMF's resources are made up of countries' initial contributions – equal to the borrowings rights – divided up between 25% in gold and 75% in national currencies.

Stabilization Fund – former name of the IMF – currencies of individual countries to settle their bilateral balances with those countries, but they were not allowed to settle their balances with third countries. Keynes did not succeed in promoting his view of a multilateral compensation of bilateral balances through an international institution and to establish a mechanism that enable countries to draw on this institution to settle any balance with another member country. Only few years after the 1944 Bretton Woods Agreements, the defects of the IMF and more generally, of the international monetary system framework, were fully exposed by Triffin long before he formulated the dilemma in 1960.

Moreover, the IMF blamed for exchange and trade restrictions while it left important latitude to countries allowing them "to maintain and adapt to changing circumstances (…) restrictions on payments and transfers for current international transactions[10]" (Article XIV, Section 2 of the IMF Articles of Agreement). As reminded by Triffin (1952):

> No country was in position to choose a permanent exchange rate or to liberalize its controls, without knowing at the same time the policies which other countries would follow with respect to their own rates and controls. (Triffin, 1952: 271)

The IMF's inability to eliminate exchange restrictions on current transactions, and outlawed bilateral payments arrangements and other forms of discrimination reinforced the world liquidity shortage. In theory, the architects of the Bretton Woods system provided against the case of a particular currency shortage. Indeed, White proposed the article VII of the IMF, best known as the scarce currency clause. When it appeared to the IMF that its holdings of a particular currency were likely to be exhausted – a creditor country's currency – the Board of Directors should propose to declare this currency scarce and above all, authorize other countries to limit and ration country's exports whose currency has been declare scarce. According to Raymond F. Mikesell:

> The scarce currency clause in the ISF [International Stabilization Fund] proposal violated the basic principle of nondiscrimination and was thus an embarrassment to the American delegation, but White defended it by stating that the ISF would never to declare the dollar scarce (Mikesell, 1994: 45-6)

In the second half of the 1940s, the scarce currency clause would have supposed to allow European countries to limit their imports from the US. According to John K. Horsefield (1969: 193), "the Board was averse to any form of discrimination, and would not have wished to impose discrimination by the use of Article VII". The IMF considered the scarce currency

[10] Members could do so, notwithstanding the provisions of any other articles of the IMF.

problem in 1947 but did not decide to take action under the Article VII, nor later. But actually, as developed earlier, trade and exchange restrictions were commonplace even if the IMF did not support it.

In the end, a vicious circle was set off. Exchange and trade restrictions in absence of full currencies convertibility kept going general disequilibria; no provision was made in the IMF's Articles to settle an effective mechanism offsetting balances between countries; in absence of such mechanism, countries needed the sole means of settlements acceptable by all, tending to make the dollar scarce; and as we will see, world liquidity shortage fed exchange and trade restrictions. Indeed, to cope with trade stagnation, bilateral arrangements were negotiated between each pair of countries and consisted of licenses and quotas for imports and exports. But these agreements resulted in a trade diverting policy and led to a reallocation of international reserves:

> To maximize the availability of hard currency [gold and dollars] that might be used to purchase from the dollar area the imports to which they attached priority, European countries restricted their imports from the rest of Europe to the value of their receipts in each European trading partner's currency. (Eichengreen, 1993: 13).

Bilateralism permitted a resumption of trade between countries partners thanks to the opening of mutual credit lines which allowed them to escape from the strict bilateral balancing of their imports and exports. These reciprocal overdrafts rights were promoted on the idea that surplus and deficits would alternate between countries, permitting to a deficit country to repay the credit allowed when later it will be in surplus. But these bilateral agreements were constraining because there was no surplus and deficits alternating between countries, leading to credit lines' exhaustion:

> Experience demonstrated (…) that some countries tended toward persistent deficits, others toward persistent surplus. Once credit ceilings were reached, additional credits were not forthcoming. And once credits were exhausted, bilateral clearing became increasingly constraining. (Eichengreen, 1993: 16)

The failure of the IMF to provide a mechanism of clearing balances and liquidity for deficit countries led to dollar scarcity. This situation gave rise to the EPU in 1950.

3.2 A multilateral approach: Triffin and the European Payments Union (EPU)

Face to the dollar shortage and structural European deficit towards the US, the American administration decided to implement a plan to finance European reconstruction and to allow

European trade resurgence. As a condition for US help, European countries had to agree on a program to allocate US loans and donations. So at the IMF, it was requested to Triffin to work on a draft to solve bilateralism and liquidity shortage in Europe. Being aware of the inability of the present system framework to promote multilateralism – the dollar scarcity situation being one of the two sides of the Triffin dilemma – Triffin first proposed the creation of a clearing house in a 1947 IMF memorandum.

In this memorandum, Triffin set the terms of the debate explaining, "as long as gold and dollar reserves remain at their present low level, only further credits can relieve the pressure for bilateral balancing of inter-European trade" (Triffin 1947b: 408). So he proposed to extend credits to European deficit countries but in a multilateral framework. This multilateral agreement would transfer the credit commitments which existed under the bilateral agreements from individual to all countries participating in this clearing house, entitled "European Clearing Union" (1947b: 409):

> The total credit commitments made by each country to other Clearing members would be paid into the Clearing in its own currency, and the country would receive an equivalent balance in the Clearing which it could then use to settle current account deficits with any Clearing member. (Triffin, 1947b: 409)

The first feature of Triffin's plan is the compensation mechanism. Thanks to the compensation between countries and the European Clearing Union and not between each pair of trading countries, a large part of bilateral imbalances could be offset. The benefits of the clearing house is the economy of means of settlement, that is to say gold and dollar, coupled with the participating countries' renouncement to discriminate European partners. The European Clearing Union in Triffin's plan bore distinct features with a central bank in that it would give credit and accept deposits from the participating countries. Moreover, balances in the Clearing should be expressed in an inter-European unit of account:

> This essential aspect of the Clearing's mechanism could be dramatized by the introduction of an inter-European currency unit, equal in value to one American dollar, and called, let us say, "European dollar" or "interfranc". (Triffin, 1947b: 410)

Nevertheless, Triffin's plan did not propose a European currency. Clearing's assets would remain in participating countries' currencies and national currencies would retain their existing independence and autonomy.

The second feature of Triffin's plan was the payment mechanism of net balances. Indeed, even if a large part of European trade would be settled, some European countries would have a net over-all deficit or surplus toward other European countries. These net balances would have to be financed within the European Clearing Union framework with gold or dollars. The first issue is to provide European countries for these liquidities but Triffin raised a second issue: in case of European countries ran an overall deficit towards the US for example, it would deteriorate both European Clearing Union's and countries' reserves without being sure of replenishing it later. Given the structural deficit towards the US in the second half of the 1940s and to avoid the paralyzation of the whole clearing machinery, the European Recovery Program, i.e. the Marshal Plan, would have to support the European Clearing Union providing dollars funds[11]. Moreover, Triffin acknowledged that European authorities would have to "define, for each European country, the maximum deficit which could be reasonably and safely incurred" (1947b: 413). Triffin did not support an automatic rule in the credits granted:

> Further credits may be required in the meanwhile, but their amount will necessarily depend on the prospective lenders' appraisal of the efforts made by each country to redress its situation. (1948: 423)

Triffin's proposal for a clearing house fits in Keynes's Clearing Union as a remedy for bilateralism and exchange and trade restrictions. Triffin's innovative idea laid on this regional monetary approach; considering that "[the IMF's] administrative machinery had been planned for a world order in which the Fund could deal with on country at a time in isolation from the others" (Triffin, 1952: 270), Triffin asserted that this institution was ill-adapted to regional issues, here the structural European deficit towards the US. The US Treasury and the Fed were strongly opposed to Triffin's proposal for a European Clearing Union. They argued that this "regional liberalization of intra-European trade and payments (…) would stifle worldwide competition and create a high-cost uncompetitive European area, condemned to increasing discrimination and protectionism to fight its deficits with the rest of the world, particularly the United States" (Triffin, 1977: 1 in RT papers N782). Moreover, Triffin's proposal was seen as a nose thumbing to the IMF while the latter was unable to promote trade liberalization and payments mechanism in Europe. But the European Cooperation Administration and the State Department supported Triffin's proposal. First send to Paris by the IMF in 1948 to follow European negotiations, Triffin left the IMF in December 1949 when he was asked to formulate concrete proposals in the name of the US – inside the Economic Cooperation Administration – to negotiate with the Organization for European Economic Co-operation. After nine months of negotiations, eighteen countries of the Organization for the European

[11] In a second memorandum, Triffin (1948: 420) proposed an external aid of $338 million which would constitute the Clearing's working capital.

Economic Cooperation signed the European Payment Union Agreement on September 19, 1950. It's striking to see that the EPU framework and operation was similar to Triffin's first draft in his 1947 IMF memoranda.

Concerning the compensation mechanism, at the end of each month, each EPU's country net balances with each other country were reported to the Bank of International Settlement[12], the EPU's financial agent, which cancelled offsetting claims to not individual country but the Union as a whole. Only mattered the net position of each country *vis-à-vis* the rest of the group. Concerning the payment mechanism, as explained by Triffin (1952: 284-285), net debts could be financed initially with credits, but eventually these liabilities had to be settled in dollars and gold. The payment in gold or dollars is determined by a quota allocated to members and by a scheme of borrowings rights and lending obligations (see Appendix 1).

Triffin's critics of the unadapted IMF architecture to promote multilateralization echoed back the debates between Keynes and White in the early 1940s. The international monetary system did not provide a mechanism to meet European demand for dollars. In absence of such a system and to reduce permanently this demand, the EPU coupled with the Marshall plan were set up and solved the scarce currency problem. The Economic Cooperation Administration allocated dollars to the estimated needs, i.e. to buy American goods, and allowed additional funds to cover the probable net outgo of dollars form the system[13]. To a certain extent, the EPU finished its task successfully and while it was expected to come to an end in 1952, the EPU was postponed until 1958 when the participating countries restored current account convertibility. Between 1950 and 1958, three quarters of participating countries' balances were offset, the later quarter necessitated payment in gold and dollar. The economy in means of settlements was obvious. Moreover, on the same period, the European trade had more than double in value. The EPU Agreement helped to stimulate trade between European countries, to deter them from discriminate their trade partners and tend to reduce trade and exchange transactions between participating countries[14]. Without resorting to full currencies convertibility and relying on the clearing mechanism in a regional

[12] Even in the EPU operation, the IMF decided not to play a role.

[13] The US helped to establish the EPU's working capital ($350 million) and in addition gave assistance to member structural debtors.

[14] Nevertheless, Triffin acknowledged that even if the "EPU system has restored multilateralism over a wide area, [it] has left intact – and might even increase – discrimination against the dollar area."(1952: 299). In Triffin's mind, there was no more than the consequence of the scarce currency situation. Since the dollar emerged as the international money as good as gold, there was a huge demand for it. In time of dollar shortage and current account inconvertibility, European countries diverted trade flows from the American continent to the EPU participating countries.

cooperation framework, European countries succeeded in coping with dollar shortage and bilateralism.

4. Triffin Dilemma and Central Banking (1950-1960)

In this section, we examine Triffin's further reflections and propositions for regional monetary approach in the 1950s. According to Triffin, the gold exchange standard is unable to provide a sustainable amount of international liquidity without impeding the stability of the whole international monetary structure. The composition of international reserves posed problem in the late 1950s since the dollar shortage situation was replaced by a dollar glut, weakening the net reserve position for the US. Further, provision of international reserves appears to be US' decision to have a large deficit in the current account or to export capital to foreign countries. In other words, in the gold exchange standard regime, the international liquidity issue was utterly tied down to the US state of affairs and policy.

It is interesting to show that Triffin had a bottom-up approach to solve the dilemma: his implication in European monetary integration gave him the theoretical and empirical basis to promote his plan for a reform of the international monetary system. According to Triffin, world-wide cooperation was to be decentralized, "promoting a closer integration between neighboring countries than would be either objectively desirable or politically feasible in a broader framework" (1951: 451). The EPU was an example of regional monetary integration and was not considered by Triffin as an alternative to the IMF's objectives. On the contrary, far from being the IMF's rival, the EPU was an integral part of international cooperation framework. This point helps to understand that 1960 Triffin dilemma was formulated because European countries decided to end the EPU in 1958 in order to restore full currencies convertibility for current account transactions. As developed earlier, the formulation of the Triffin dilemma was the consequence and not the cause of Triffin's involvement into regional monetary integration.

4.1. The European Central Bank

As the architect of the EPU and the US representative at the OEEC since 1949, Triffin became the US alternate representative on Managing Board of EPU in 1950. Disagreeing with the instructions that he received from the new Eisenhower administration, Triffin resigned in

August 1951[15] and was made professor at Yale University until 1977. Face to IMF's failure to promote multilateralization of payments and after several years of negotiations about international monetary issues, both at Washington and in Europe, Triffin strengthened his conviction that monetary reforms had to be implemented at the regional level. While he saw Keynes' Clearing Union as an "ideal one" (Triffin, 1953: 9 in RT papers N593), he regarded it "as still premature and utopian" (ibid.). According to Triffin:

> (…) It is extremely difficult to create an effective form for quick negotiation among fifty countries or more, on the multiple issues for discretionary decisions by the Union: monetary policy, commercial policy, exchange rates, etc. Such discussions and negotiations can be conducted effectively only between a limited number of participants, all interested in the question at issue, highly interdependent on one another decisions, keenly aware of this interdependence, and willing to trust one another to fulfill the obligations assumed. (Triffin, 1953: 9 in RT papers N593)

Moreover, from the beginning of the EPU in 1950, Triffin never stopped to consider that "the EPU Agreement [was] only the first of many steps on a long road toward the eventual integration of European monetary policies and institutions" (Triffin, 1966: 449). So Triffin deepened his view on the regional monetary integration and cooperation.

On a regional scale, Triffin proposed to deal with monetary integration in depth. His final objective was to transform the EPU into a European Central Bank (thereafter ECB), able to lend and rediscount to national central banks, with a unit of account that could be also a means of payments between countries and centralizing participating countries' international reserves. These three features of such an institution could lead to the creation of a single currency area in which a European currency would be used for international transactions without remove national monies for national transactions. This reform proposal was first exposed in a memorandum transmitted to Economic Cooperation Administration in November 1951.

The first step toward a fuller monetary integration in Europe was to build a joint reserve fund for European countries:

> Such centralization of reserves is certainly one of the first prerequisites and functions of a European Central Bank. (Triffin, 1951: 459)

The concentration of international reserves, originally held by European countries in its own central banks, in the ECB would be a means to economize gold and dollar. The excess credits,

[15] In an interview realized in 1990, Triffin reminded this event in its carrier without shedding light on the content of US instructions. However, it could be easy to see that the American administration wanted to undermine the EPU. See Catherine Ferrant and Jean Sloover (2010: 41).

for countries which ran a net surplus position beyond the quota against other European countries, would be settled in convertible accounts rather than dollars or gold. Cash economized could guarantee these accounts. As noted by Triffin:

> Unspectacular in itself, the convertible account technique would set in motion the very mechanism out of which modern banking actually developed over the course of history. (Triffin, 1951: 459)

The second step towards fuller monetary integration was the strengthening of the EPU managing board influence on the member countries' monetary policies to avoid excessive current account deficit or surplus. With the centralization of reserves and the convertible account technique, the ECB "could place at the disposal of its members [gold and dollars] in case of need" (Triffin, 1951: 459). In that way, it could reinforce the influence of the EPU managing board by placing at their disposal larger financial resources to "back up its advice to members" (ibid).

The perpetuation of the EPU through the centralization of reserves is a recurrent idea in Triffin's works during the 1950s. In a 1953 memorandum, entitled *Convertibility and the E.P.U,* Triffin reminded the importance to create convertible accounts to facilitate monetary transfers inside the EPU and with the dollar area. In order to strengthen the ability of the EPU to lend more to members countries, theses latters should have to contribute to the increase of the EPU's working capital "to finance automatic or special assistance overdrafts facilities to the countries whose convertible account is exhausted, and who lack other resources or current earnings to replenish it" (Triffin, 1953: 13 in RT papers N593). By centralizing EPU members' reserves, "the convertible account system should develop EPU into a major monetary center attracting a portion at least of the monetary reserves of non-member countries as well as of member countries' (ibid.). Drawing on his experience, Triffin tried to set up an institution in charge of monetary flows between Europe and the Dollar area trough a collective management of national reserves (Eric Bussière and Olivier Feiertag, 2012: 76). This European monetary framework would aimed at avoiding the dollar shortage experienced by European countries in the second half of the 1940s while reinforcing monetary integration at the regional level.

Triffin's support for a European reserve fund was repeated in 1955 when the European Monetary Agreement was signed in order to replace the EPU in time. This agreement provided for a fund in order to lend in the short run to weaker European countries. These loans enabled them to respect the return to currencies convertibility. According to Triffin, this fund was not enough ambitious and he "advocated the transformation of the EPU into a European Clearing House that would also pool about 20% of the total gold and foreign exchange reserves held by European central banks" (Maes and Erik Buyst, 2004: 433). Triffin was not heard since in December 1958, the EPU was cleared and all European countries returned to full currencies convertibility. At this moment, Triffin tried to highlight that the risk of returning to full currencies convertibility without more cooperation between countries to ensure the operation of the international monetary system will be a blind-alley. The end of the EPU and the uncoordinated return to convertibility led Triffin to a clear-sighted analysis of the probable collapse of the gold-dollar exchange standard. This analysis was exposed in his 1960 *Gold and the Dollar crisis*.

4.2 International liquidity: the dilemma and the remedy

As reminded by Michael Bordo (1991: 61), the IMF questioned the level of international liquidity to meet countries' need at a time when world trade was increasing. In a 1958 report, the IMF recommended the increase in members' quotas to face the return to currencies convertibility in an expanding world. In his 1960 book, Triffin tackled the same issue asserting that the whole international monetary system was not adequate to the growing needs of international liquidity. Indeed, making his diagnosis on the evolution of the international monetary system, Triffin forecasted that if the US corrected its persistent balance of payments deficit[16], the gold production at 35$ an ounce would not be sufficient to meet the growth of the needs of international reserves and lead to a deflationary bias. On the other hand, if the US kept running deficits, its foreign liabilities – dollars balances held by foreign countries – would excess by far the American ability to convert these assets in gold on demand and resulting in the suspension of the gold exchange standard by the US. As summed up by Triffin:

> The most fundamental deficiency of the present system, and the main danger to its future stability, lies on the fact that it leaves the satisfactory development of world monetary liquidity primarily dependent upon an admittedly insufficient supply of new gold and an admittedly dangerous and haphazard expansion in the short-term indebtedness of the key currencies countries. (Triffin, 1960: 100)

[16] We have to be more precise when we use the term "persistent balance of payments deficit". Indeed, until the early 1970s, the US ran a current account surplus with the world. When Charles de Gaulle's Finance Minister, Valéry Giscard d'Estaing, spoke of the US "exorbitant privilege" in the 1960s, he referred to the ability for the US to borrow on short term easily and at low cost to lend on long term to the rest of the world. In other words, "the source of the dollars balances accumulated abroad was net capital outflows, nor current account deficits" (Richard Portes, 2012: 196).

This diagnosis was at the core of Triffin's analysis when he pointed out the dangerous state and prospects of international liquidity: higher will be the growth of world trade, the more international reserves countries will need (Triffin, 1960: 49). According to Triffin (1960: 61), since the end of the 1940s, the American gold reserves decreased from \$24.6 billion in 1949 to \$20.6 billion in 1958. At the same time, dollar balances held by foreign countries for official and private transactions shoot up from \$6.4 billion in 1949 to \$15.6 billion in 1958. The haphazardly development of this structure of international reserves threatened all of the international monetary and financial architecture, which would lead to the collapse of the gold exchange standard in a case of a confidence crisis. Triffin explicitly drew the parallel between 1931 and a probable demise of the Bretton Woods system:

> This [the run on key currencies and flight to gold] happened to the United Kingdom in 1931. The collapse was then brought about by large shifts of sterling balances into gold and dollars, leading to the devaluation of sterling. (Triffin, 1960: 67)

Triffin put to the light the inconsistency of the gold exchange standard. To some extent, the threat of a crisis confidence in dollars denominated assets holdings increased the instability of all the international reserve system[17].

This diagnosis was not only an alarming observation of the actual working of the Bretton Woods system and its prospects, but also an acknowledgment of failure of the regional monetary integration. Indeed, *Gold and the Dollar Crisis* has to be read in a historical perspective, that is to say the abandonment of the EPU when European countries returned to currency convertibility. As well summarized by Maes and Buyst (2004: 433):

> It is very remarkable that, in 1955-1957, the six "Schuman" countries made two very different choices: a regional one for the integration of goods markets, with the Rome Treaty, and a world wide one for monetary integration, with complete convertibility in the framework of the Bretton Woods system.

To get out of the dilemma, Triffin's reform proposal would be implemented on two levels.
The first level would be the development of regional monetary integration, on the European example. In that scale, a regional central bank would offset balances between countries, centralize reserves and grant credits to deficit countries. Actually, Triffin iterated the same propositions as before:

[17] In his 1957 *Europe and the Money Muddle*, Triffin already forecast the formulation of the dilemma: "The enormous improvement of foreign countries' reserves which has taken place in recent years has been primarily the result of vast redistribution of net reserves from the United States to the rest of the world (…) it is evident that such a movement could not continue indefinitely without eventually undermining confidence in the dollar itself" (Triffin, 1957: 296-297)

> The participating countries would establish jointly a Clearing House centralizing all payments among their separate central banks. These payments would be effected through corresponding debits and credits to the account maintained by each central bank with the Clearing House. (Triffin, 1960: 124)

The resources of the clearing would be made up of gold and convertible foreign currencies, in order to maintain the convertibility of participating countries' accounts. As highlighted by Triffin, this reform proposal for European countries "would be regional, rather than world-wide in scope, (…), and could probably negotiated and implemented more easily, more rapidly and more fully within such a framework" (1960: 125). So Triffin supported regional monetary integration, on the European example, but for others regional zones like Latin American countries and African Countries[18].

The second level is an international one and consisted in a reform of the IMF's structure. To cope with the instability of using national currencies as international money, Triffin advocated to replace gold and foreign currencies balances, such as dollar and sterling balances, by gold-guaranteed deposit accounts at the IMF (Triffin; 1960: 102). These IMF balances would be gradually the major source of increase of international reserves. In other words, the IMF would control the expansion of world liquidity to countries' needs. As the EPU for European countries, the IMF would be able to clear balances between countries and propose credits from the net surplus to the net deficits countries (Triffin, 1960: 115).

Triffin saw the new IMF as a central bank of the national central banks, whose objective would be to regulate disequilibrium between regional monetary zones. Gold would remain an international reserve but the IMF would create a new international money, consisting in bank deposits. In the end, the IMF would act a clearing house, centralizing countries' reserves. Nevertheless, as reminded in his 1990 interview (Ferrant and Sloover, 2010: 48-49), Triffin considered the creation of a supranational central bank as a pious hope but regional central banks, on the EPU model, could be feasible. In the end, the management of the new international monetary system would be decentralized, regional monetary zones acting under the aegis of the IMF.

[18] Triffin's efforts to promote regional trade and payments agreements in Latin American countries, Asia or Africa were important since the 1950s. See Triffin (1966, Chaps. XII and XIII).

5. Conclusion

In his 1960 *Gold and the Dollar Crisis*, Triffin warned the IMF and the leading countries that the Bretton Woods system was not sustainable because the huge accumulation of foreign dollar balances to meet international liquidity needs made the system dynamically unstable. According to Jacques de Larosière (1991: 137), “Robert Triffin was the first to show how persistent US balance of payments deficits and the accumulation of dollars would ineluctably led to an embargo on gold and devaluation of the dollar”. Despite some marginal arrangements to relieve pressure on the Bretton system from 1960 – the Gold Pool in 1961 and the creation of the Special Drawing Rights as a new form of international liquidity in 1968 – the system collapsed when the American President, Richard Nixon, decided to suspend the gold convertibility of the dollar in 1971.

In this article, we focused on the origins of the formulation of the Triffin dilemma. We supported the idea that understanding the *Gold and the Dollar Crisis* analysis calls for a study of Triffin’s involvement in European monetary integration. Firmly convinced that his 1947 plan for a European clearing mechanism was the solution to resurge European trade and reduce permanently the demand for dollars from European countries, Triffin began to see regional monetary integration as a solution for the defects of the Bretton Woods system. In this context, this paper also pointed out that a key issue for Triffin was the proper use, amount and composition of international reserves. In the line of the debate between Keynes and White held during the Bretton Woods negotiations, Triffin argued that the gold exchange standard was unable to provide both sufficient international liquidity and stability in the making of external payments since national currencies were used as international monies. Well aware of that inconsistency, Triffin never stopped to promote deeper European monetary integration and cooperation as complementary to a reform of the international monetary system.

As the EPU architect, Triffin was influential during the 1950s even if his thorough proposition for regional monetary integration was not followed. As Cassandra, a figure of Greek Mythology having the power of prophecy, Triffin predicted before everyone the demise of the Bretton Woods system but was not heard by the officials. Very humble, Triffin reminded that his contribution to international monetary analysis was simple: “(…) my only originality, as an economist, is to have constantly stressed that “bons sens” [reason] is often the opposite of “sens commun” [common sense]” (Ferrant and Sloover, 2010: 67).

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Appendix 1.

<u>EPU Quota</u> (in million US$)

Sterling area	1060	Norway	200
France	520	Denmark	195
West Germany	500	Austria	70
Belgium Luxembourg	360	Portugal	70
Netherlands	355	Turkey	50
Sweden	260	Greece	45
Switzerland	250	Iceland	15
Italy	205		

Each country received a quota equal to 15% of its total merchandise trade (visible and invisible transactions) with EPU members' countries in 1949. For each country, its quota limits the rights to borrow or the obligations to lend. The settlement of balances – in gold or dollars – is as follows.

<u>Borrowings rights and lending obligations</u>

% Of Quota	DEBTORS		CREDITORS	
	Credit	Gold Payment	Credit	Gold Payment
20	20	-	20	-
20	16	4	10	10
20	12	8	10	10
20	8	12	10	10
20	4	16	10	10
100	60	40	60	40

To illustrate the mechanism, let us take the example of West Germany, with a quota of $500 million, which runs a deficit *vis-à-vis* the EPU of $100 million during the first period. Since its deficit is equal to 20% of its quota, it is entirely financed by credit. Let us assume now that during the next period, West Germany accumulates a deficit amounting $200 million, that is to say 40% of its quota. In that case, it can borrow a further sum of $80 million ($\frac{16}{20}$ x $100 million) and pay to the EPU $20 million ($\frac{4}{20}$ x $100 million) in gold or dollars. The more the country runs a deficit with the EPU, the more in proportion it has to pay its debt in gold/dollars. For creditors countries, the mechanism is the same: the more a European country runs a current account surplus with the EPU, the less in proportion it is paid in gold/dollars.