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Abstract

The Bretton Woods system is often described as freeing national monetary policies from the gold-reserve constraints of the gold standard. Breaking the “gold fetters” was essential to the embedded liberalism and economic interventionism of the postwar era. Yet gold retained a crucial role: monetary authorities backed currency with gold reserves, both de facto and de jure, frequently maintaining gold cover ratios comparable to those of the gold standard. How, then, could gold backing coexist with autonomous domestic macroeconomic policy? This article shows that the combination of two phenomena provides an answer: credit growth and currency growth became increasingly decoupled after 1945, and central banks shifted their emphasis from money toward credit. This created substantial scope to stimulate domestic economic activity through credit expansion without being constrained by the link between gold and currency in circulation. Econometric analysis for 38 countries indicates that gold reserves remained strongly correlated with currency, but not with bank credit. Changes in credit markets and central bank instruments therefore allowed gold backing to persist largely as a symbolic tie, without constraining domestic policy. Gold, however, exerted pressure on US policy and shaped international monetary relations. These findings indicate that institutional persistence does not necessarily generate similar economic effects across historical periods.

JEL Classification: D8, E5, F5, F55, M14, N1

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The Bretton Woods system is usually viewed as the heyday of 'embedded liberalism', defined as the combination of trade integration and multilateralism with autonomous domestic macroeconomic policies aimed at promoting national growth and welfare.[1] This institutional arrangement lasted from the end of World War II until the suspension of official gold–dollar convertibility in 1971. It allowed most countries to pursue autonomous monetary policies while maintaining fixed exchange rates. Unlike earlier gold standard regimes, domestic economic policies were no longer tightly constrained by private financial markets or by gold reserves.[2] Only the United States was required to hold gold reserves and to convert dollars into gold at a fixed parity for foreign central banks; other countries pegged their currencies to the dollar without any obligation to hold gold.

However, as several recent pieces of research have shown, gold remained a pillar of both international financial markets and central bank policy until 1971.[3] Not only did monetary authorities resume accumulating gold reserves after the war but they also used these reserves to back currency issuance (i.e. banknotes in circulation), exactly as in the gold standard.[4] This leaves us with a puzzle: how could gold standard habits coexist with the 'embedded liberalism' and monetary autonomy of Bretton Woods?

Economic historians have discussed how capital controls and multilateralism helped countries insulate domestic policies from balance of payments flows under Bretton Woods. [5] However, this alone cannot explain why gold-backing of currency issuance could coexist with

[1] The term 'embedded liberalism' was coined by John Ruggie, drawing on the work of Karl Polanyi (see below), and is widely used in international political economy to describe the institutional compromise underlying the Bretton Woods system. See Ruggie, 'Embedded liberalism'; Helleiner, 'Embedded liberalism'. It corresponds to what economic historians and macroeconomists refer to as monetary policy autonomy within the framework of the Mundell trilemma, that is the ability to pursue national macroeconomic objectives without being constrained by the exchange-rate regime or capital account openness. See Obstfeld and Taylor, *Global capital markets*.
[2] Polanyi, *The great transformation*; Eichengreen, *Golden fetters*.
[3] Schenk, 'Global gold market'; Bordo et al., 'Gold Pool'; Monnet and Puy, 'Old habits'; Jabko and Schmidt, 'Twilight of gold'.
[4] Monnet and Puy, 'Old habits'.
[5] Bordo, 'Bretton Woods'; Eichengreen, *Globalizing capital*, Helleiner, 'Embedded liberalism'; James, *International*, Monnet, *Controlling Credit*, Naef, *Exchange Rate History*, Ruggie, 'Embedded liberalism'; Schenk, *Decline of Sterling.*

autonomous monetary policy. Even with capital controls, a monetary expansion, for example, would still have required the purchase of gold abroad, with a potential impact on the balance of payments.

This article first characterizes the status of gold under Bretton Woods in law and practice. Second, it explains how gold backing was compatible with autonomous monetary policy. To provide this broad perspective on the 25-year system, the analysis draws on diverse primary and secondary sources, bringing together strands of literature previously kept separate.

The status of gold was ambiguous and ill-defined at the 1944 Bretton Woods conference. Gold entered international law for the first time, but nothing in the Bretton Woods agreements required non-U.S. countries to hold gold, nor did they specify how gold reserves should be managed or what role they were meant to play. Private financial actors and monetary authorities thus gave gold new roles and meaning in the 1950s and 1960s, which had not been anticipated originally. Adherence to gold cover ratios (i.e. gold backing of currency in circulation) was not only an informal practice that re-emerged after the war. In several countries, the requirements to hold gold as a proportion of currency issued remained in place or were even (re)introduced in central bank legislation. Even some newly independent countries, which had not inherited central bank legislation from the past, were keen to limit their money creation through gold reserves. However, countries attached different meanings to gold standard practices, as case studies of Belgium, the United States, Lebanon, and Egypt illustrate.

The second half of the article reconciles the persistence of gold backing of money issuance with the common wisdom of autonomous monetary and credit policies under Bretton Woods ('embedded liberalism'). This is achieved by highlighting two key features of this era that were underappreciated and remained unconnected in previous research. The first is a strong and unprecedented decoupling between the growth of credit on one hand and the growth of money on the other hand (and in particular of currency in circulation and deposits at the central

bank, which were still legally required to be backed by gold in many countries). Data for 15 countries from the late nineteenth century show that, after 1945, credit grew much faster than currency in circulation, at rates unprecedented in earlier periods. This pattern reflected both the consequences of the wartime shock (during which money issuance expanded massively while bank credit collapsed) and postwar government policies aimed at developing and regulating credit. In advanced economies, credit growth exceeded currency growth by 6-7 percentage points; three to six times larger than under the classical and interwar gold standards. Such a divergence provided substantial room to promote domestic economic activity through credit expansion without being constrained by 'golden fetters.'[6]

The second feature – related to the first – is the priority given to credit rather than money by central banks under Bretton Woods. 'Credit control' became the new rallying cry of central banking in this era. Central banks saw credit growth as the main indicator of macroeconomic imbalances (for expansionary or contractionary policy) and used regulatory instruments to directly control this variable, such as credit ceilings or liquidity ratios.[7] Thus, they could reduce credit growth to fight inflation without directly affecting the money base. This was also reflected in the International Monetary Fund (IMF) doctrine during the same period. Credit became the key variable considered in the IMF's macroeconomic models in the 1950s and 1960s.[8]

These features suggest central bank credit policies were not constrained by gold reserves, which were linked to currency in circulation rather than credit. This argument is further supported by carrying out econometric estimations on a panel of 38 countries under the

[6] To be sure, maintaining a gold cover ratio did not eliminate all forms of short-term flexibility in front of temporary shocks, as shown for central banks operating under the classical gold standard. See Bazot et al. 'Taming'. However, such short-term flexibility would not have been sufficient to accommodate the exceptionally high rates of domestic economic growth observed during the Bretton Woods period had credit not expanded much faster than banknotes in circulation.
[7] Aikman et al., 'Radcliffe'; Galati et al. 'Credit restrictions'; Jonung, 'Credit controls', Monnet, 'Monetary policy', Monnet, *Controlling Credit.*
[8] Polak, 'Monetary analysis'; Polak, 'IMF monetary model'.

Bretton Woods period. Whereas gold reserves and currency (banknotes) in circulation are significantly and strongly correlated in both pooled panel and country-fixed effects estimations, there is only a negligible or no significant correlation between credit and gold reserves. These results confirm that, unlike money, the growth of credit was unrelated to the evolution of gold reserves.

This analysis thus starts where the paper by Monnet and Puy ended.[9] The latter had previously shown that the monetary authorities' gold reserves and currency in circulation (both scaled by GDP) were significantly correlated under Bretton Woods. The correlation was of the same order of magnitude as gold cover ratios under the gold standard: increases in gold reserves amounted to roughly 30–40 percent of the corresponding increase in banknotes. Yet this previous investigation left unanswered the question of whether this correlation, which implies 'golden fetters' as binding as those of the gold standard, was compatible with autonomous domestic macroeconomic policy. The present study argues that there was no such incompatibility under Bretton Woods and explains why. Moreover, as a purely quantitative analysis, Monnet and Puy's paper did not examine the continuity, or postwar introduction, of gold cover ratios in central bank legal statutes, nor the various motives underlying the persistence of gold backing.

Quantitative support for this paper's argument required two extensions to the macroeconomic datasets used in previous studies. First, new data were collected on banknotes in circulation and central bank reserves in order to document an unprecedented disconnection between the growth of these variables and credit growth under Bretton Woods. While Schularick and Taylor already documented such a disconnection using M1 (currency in circulation plus demand deposits), it remained to be shown for the monetary aggregates that were explicitly backed by gold reserves: namely banknotes and, in some cases, bank reserves

[9] Monnet and Puy, 'Old habits'.

at the central bank (M0).[10] These data are assembled for 15 countries from the late nineteenth century onward. Second, although Monnet and Puy's paper examined the relationship between money and gold in a sample of 38 countries under Bretton Woods, it did not consider credit.[11] Bank credit statistics are newly used in the present paper and are for the same 38 countries over the same period, allowing the analysis to highlight the disconnect between credit and banknotes in circulation, as well as their distinct relationships with gold reserves.

The separation of credit and money growth allowed central banks to retain a symbolic role for gold while pursuing autonomous credit policies to stimulate economic development or curb inflation. This is not to say that the balance of payments was never a constraint under Bretton Woods. Indeed, many countries adopted restrictive credit policies to contain inflation and avoid excessive current account imbalances.[12] But this was no longer linked to gold flows and to the state of gold reserves. Only in the case of the United States, as we shall see, speculative attacks on the exchange rate did involve the gold market. But this was unrelated to the state of the US gold cover ratio (abandoned in 1968).

The study of postwar gold reserves leads to some general conclusions that should be of interest to economic historians and social sciences beyond specialists of the Bretton Woods system. The first is that the history of the international monetary system must be investigated at the same time as the history of national credit markets. The autonomy of central bank policies is not only framed by the exchange rate regime and capital account openness but also by the characteristics of national credit markets and domestic financial regulation. The second conclusion concerns the persistence of institutions and norms and its consequences for economic outcomes.[13] The history of gold under Bretton Woods is not only a good illustration of how cultural norms and even legal rules are reassembled and given new meanings in response

[10] Schularick and Taylor, 'Credit booms'.
[11] Monnet and Puy, 'Old habits'.
[12] See, for example, Banerjee, 'UK fiscal policy', Monnet, *Controlling credit*, chp.4
[13] See, for example, Acemoglu and Robinson, 'Culture and institutions'.

to changing circumstances – as Jabko and Schmidt have already pointed out in this case.[14] It is also a striking case of how norms and legal institutions can have very different economic effects when economic structures and other institutions change. Observing the persistence of certain norms and institutions is certainly not enough to assume that their economic impact will be similar and uniform over time.

I- THE BRETTON WOODS SYSTEM AND THE UNDEFINED ROLE OF GOLD

The 1944 Bretton Woods Articles of Agreement created a new international monetary order.[15] The International Monetary Fund was founded to provide short-term liquidity to monetary authorities.[16] Capital controls were officially allowed to avoid destabilizing financial flows (Article VI.3). Pegged exchange rates could be adjusted with the approval of the IMF in the event of a fundamental disequilibrium. Fixed exchange rates were no longer defined only in terms of gold parity, but also in terms of dollars (Article IV.1). Only the US dollar was defined as convertible into gold at $35 per ounce. Finally, gold coinage and the obligation of central banks (or Treasuries) to redeem banknotes in gold were abandoned everywhere in the world.

The last feature, demonetisation of gold for individual transactions, was not in the Bretton Woods Articles. It resulted from national gold laws in the 1930s-1940s that prohibited gold coins.[17] The new international monetary system was to function without any country being forced to use gold as domestic money or to redeem paper money in gold coins or bullion. This gave multilateral legitimacy to the 1934 US Reserve Gold Act, which prohibited gold coins as money (except for professional and industrial use) and dollar redemption for gold.[18] Only

[14] Jabko and Smith, 'Twilight of gold'.
[15] *Articles of Agreement of the International Monetary Fund* adopted at the United Nations Monetary and Financial Conference (Bretton Woods, New Hampshire) on July 22, 1944..
[16] The IMF came into official existence on 27 December 1945, when 29 countries signed its Articles of Agreement. It began its operations on 1 March 1947.
[17] Aufricht, *Central banking legislation, vol.1 & 2*. Gold, 'Gold'.
[18] Congress of the United States, Act No. 87—73d [H.R. 6976], January 30 1934. In some countries, including England, the interwar gold standard had already limited the redeemability of notes at the central banks to bullion instead of coins, thus discouraging private holding of gold but without legally breaking the link between gold and money; see Eichengreen, *Golden fetters*, p.193.

Federal Reserve Banks could hold monetary gold in the U.S. The Bretton Woods system set in stone that gold could only retain a monetary function as a medium of exchange between the monetary authorities of different countries ('monetary gold'), not for retail payments. The monetary status of gold thus became a matter of international law (see next section), while gold was demonetised in all national laws.

Consequently, the common view, as summarised by the political scientist John Gavin, is that 'this system differed greatly from a traditional gold standard, where the domestic money supply – and hence the domestic price level – was directly determined by the national gold stock'.[19] Monetary multilateralism and recognition of policy autonomy enabled 'embedded liberalism': reconstructing globalization through trade and fixed exchange rates while ensuring governments could pursue autonomous macroeconomic policies.[20] As Ruggie wrote, 'multilateralism would be predicated upon domestic interventionism'[21]. Eric Helleiner goes further by claiming that 'in its original formulation, the Bretton Woods order was designed […] for other kinds of 'domestic interventionism', such as those associated with state-led development strategies in poorer regions of the world and even central planning.'[22]

This view of International Political Economy scholars is shared by other traditions of thought. Institutionalist economists emphasise the importance of the Bretton Woods agreements for 'Fordism' or 'contractual capitalism' that preceded neoliberalism.[23] Economic history based on international macroeconomics argues – through the prism of the trilemma of international finance – that Bretton Woods gave central banks strong autonomy.[24] Econometric estimations

[19] Gavin, 'Gold, dollars, and power', p.17
[20] Key to this compromise was the prohibition of foreign-exchange controls in the Articles of Agreement, which aimed to facilitate trade integration, while capital controls were explicitly permitted (see above).
[21] Ruggie, 'Embedded liberalism', p.393.
[22] Helleiner, 'Embedded liberalism', p.1116.
[23] Aglietta, *A Theory.*
[24] Bordo and James 'Trade-offs'.

confirm that this is the historical period when central banks were best able to conduct an autonomous monetary policy while maintaining a fixed exchange rate.[25]

The official purpose of international reserves (foreign exchange and gold) under Bretton Woods was no longer to back money issuance but to limit the transmission of economic crises through the balance of payments. For this reason, economists and international institutions developed the idea that the holding of international reserves should depend on the volume of trade, not on the issuance of currency and the money supply. This was central to 1944 discussions: as Williamson noted, reserves were recognized as relevant for international purposes rather than backing money supply, with Keynes's bancor quotas related to trade.[26] The economist Robert Triffin made this point consistently from the late 1940s and reiterated it in his influential 1960 book: 'The main function of reserves is no longer to preserve the overall liquidity of individual central banks, but to permit the financing of short-run deficits in the country's external transactions'.[27]

In the 1950s, the IMF elaborated a doctrine linking the volume of domestic trade to the level of a country's international reserves. In 1953, at ECOSOC's request, the IMF prepared its first report on 'adequacy of monetary reserves' to protect countries from external deflationary shocks.[28] These principles were restated in a more comprehensive study on the same subject published in 1958, titled 'International Reserves and Liquidity'.[29]

However, the IMF said nothing about whether reserves should be held in gold or foreign exchange. Both gold and other forms of international reserves are mentioned in these documents and appear to be legitimate. So, as at the Bretton Woods conference itself, there was no attempt to marginalize gold reserves. Gold was seen as consistent with embedded liberalism as long as

[25] Obstfeld and Taylor, *Global capital markets.* Bazot et al. 'Central banks'.
[26] Williamson, 'Bretton Woods', p.688.
[27] Triffin, *Gold*, p.31.
[28] International Monetary Fund, *Twenty years*, p.311
[29] Ibid. p.349 et al.

it formed part of a country's international reserves and was held in proportion to trade. It was no longer supposed to be a constraint on money creation but, on the contrary, a tool to finance trade in hard times and thus to avoid economic downturns and 'the spread of depression from one country to another.'[30]

Countries were willing to abandon the domestic monetary role of gold for individual transactions, but not as a basis for international cooperation (multilateralism). Even J.M. Keynes - the author of the British plan at the Bretton Woods conference - advised to 'continue to use gold and its prestige as a means of settling international accounts'.[31]As a result, gold entered international law for the first time in history.[32] The gold standard had worked because countries committed themselves (through national legislation) to redeem paper money for gold at a fixed parity. But there was no international institution to force them to do so, and no international law to regulate the use of gold between countries. In contrast, the countries that first signed up to the IMF's Articles of Agreement bound themselves in terms of international gold transactions.

Gold entered international law in several ways. The United States agreed to exchange US dollars for gold at the request of members.[33] IMF members paid a (small) part of their contribution to the IMF in gold, and the IMF could exchange gold for a member's currency.[34] Last, IMF members committed to only buy gold (from private parties or other countries) at a price above face value (plus a margin prescribed by the IMF) or sell gold at a price below face value (minus a margin prescribed by the IMF). This was to prevent a country from speculating in gold against the principles of monetary cooperation.

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[30] Ibid. p.323.
[31] Speech by Lord Keynes, May 23, 1944. *Hansard Parliamentary Debates,* House of Lords, 5th Series, Vol. CXXXI, 838-49. Eichengreen, 'Bretton Woods', reviews other plans presented at Bretton Woods that all considered gold.
[32] Gold, 'Gold'.
[33] Formally, the US only accepted to undertake this obligation in a letter to the IMF dated May 20, 1949. See Gold, 'Gold', p.729 and 751.
[34] Articles of Agreement of the International Monetary Fund, July 22, 1944, Article III, section 3.

Gold was the backbone of international cooperation but, except the USA, no country was required to hold gold for cooperation to work. As summarized by Joseph Gold, the main legal expert at the International Monetary Fund in the 1960-1970s, 'The fundamental role of gold under the original Articles [of the IMF] must not be confused with its functions under the gold standard. The Articles did not provide that the volume of a nation's currency was to be governed by the volume of gold owned by the nation's monetary authorities.'[35]

The fundamental problem of the Bretton Woods agreements was that they gave a key role to gold for international monetary cooperation but did not envisage how the incentives and practices of monetary authorities, as well as private market forces could undermine this cooperation. The role of gold was left undefined, or ill-defined, in the sense that it was central to multilateralism but there was no common rule governing how countries should manage their gold reserves to be consistent with multilateralism. This neglect is actually not surprising given the context of the international conference of 1944: the US owned 90 per cent of the world gold stock, it was believed that the gold standard was definitely a thing of the past and that allied countries were tied together by strong mutual interests. It had, however, unforeseen consequences.

II- THE RESURGENCE OF GOLD AND GOLD STANDARD HABITS

This section brings different recent strands of literature together in order to highlight how the role of gold under Bretton Woods was not given from the outset, but was gradually (re)constructed through the practices and beliefs of private actors and monetary authorities.[36]

[35] Gold, 'Gold', p.731-32.

[36] Monetary authorities actively increased their gold reserves immediately after the war and during the 1950s, so that the share of US gold reserves in total world gold reserves fall from 90% in 1945 to 70% in 1950 and 48% in 1960. Gold did not actually leave the United States in the 1950s. It was acquired by other countries and earmarked as their property but it remained in US vaults. See Bank of International Settlements, *25th Annual Report*, p.137.

The Bretton Woods system ended in August 1971 because the gap between the official gold–dollar parity and the free-market gold price became too large and unsustainable for the United States. Research has thus emphasized the private gold market's pressure on US policy. As Schenk noted, gold's monetary role and the global market must be studied together.[37] There was no international free market for gold when the Bretton Woods agreements were signed in 1944. While many transactions took place in Zurich, it was not until the reopening of the London gold market in 1954 that international gold transactions found a common hub. In addition to its historic role in gold transactions, London benefited from its links with South Africa, the major gold producer at the time.

English policymakers encouraged reopening the London gold market to restore the City's financial role.[38] The Federal Reserve supported returning to free international gold transactions, not foreseeing difficulties for the US exchange rate.[39] The Bank of International Settlements viewed the reopening of the market as a good way of disciplining governments, whose role had grown rapidly in the post-war years.[40] The IMF eventually supported this reopening by reducing the margins imposed on the price at which monetary authorities could buy or sell gold to private agents.[41] This represented a significant departure from the IMF's initial reluctance to allow private transactions in gold, which had previously been expressed in a letter sent to members on 18 June 1947.[42]

Private financial actors deeply believed in gold's international role. Private demand was driven by industrial needs, speculation against fixed rates, and desire to force sound government policies.[43] As the London market became more liquid and active, it became a barometer of

[37] Schenk, 'International monetary system'.
[38] Schenk, *Decline of Sterling*, p.111.
[39] Naef, *Exchange rate history*, chp.5.
[40] Ibid, p.74.
[41] Bank of International Settlements, *25th Annual Report*, p.132.
[42] Gold, 'Gold', p.735-738.
[43] Kriz, 'Gold in world monetary affairs'; Kriz 'Gold: barbarous relic'. A very good description of the functioning of the London Gold Market is available in Bank of International Settlements, *25th Annual Report*, 130-140.

confidence in the dollar.[44] It also helped other central banks to rebuild their gold reserves in the late 1950s.

By October 1960, in the midst of the US presidential election, the dollar price of gold on the London market was so high as to require intervention by the Bank of England and then, indirectly, by the Federal Reserve. To avoid further destabilisation, the US formed a consortium (the Gold Pool) with the major economic powers and gold holders of the Western world. Its aim was to intervene in the market and prevent a rising gold price from forcing a devaluation of the dollar.[45] Until March 1968, the dollar price of gold on the 'free' London market was in fact a managed price, controlled by the Bank of England on behalf of the Pool. The sterling crisis of November 1967 was the fatal blow that triggered contagion to a massive dollar crisis, leading to the creation of the two-tier market in March 1968.[46]

The two-tier market isolated the London market's price from monetary authorities' transactions with the Federal Reserve. IMF members pledged not to engage in private gold transactions. [47] This led to the creation of Special Drawing Rights in 1969 in order to provide an alternative reserve asset to these central banks. But it ultimately failed to reassure IMF member countries that the US would avoid devaluation. The US finally decided to close its gold window on 15 August 1971, thus repudiating the commitment it had made in the original Articles of Agreement.[48]

[44] Moreover, the London gold market became the place where the cold war issues met the functioning of the Bretton Woods system, since gold sales by the USSR started to influence greatly the price of gold in the 1960s and major economies realized that the price and quantity of gold was highly dependent on supply from South Africa. The reluctance of the US to increase the price of gold (i.e. devalue the dollar) was also motivated by the unwillingness to provide a financial gain to these two major gold producers; see Kriz 'Gold: barbarous relic'. The United Kingdom would repeatedly fear that too much intervention in the London gold market would lead South Africa to stop selling gold in London and leave the sterling area; see Bordo et al. 'Gold pool', p. 1033.
[45] Bordo et al. 'Gold pool'. This did not imply any change in the IMF Articles of Agreement since the Gold Pool was managed at the Bank of International Settlements.
[46] Ibid.
[47] Schenk, *Decline of Sterling*, p.183-5.
[48] For the legal aspects of this decision and the status of gold in the following years, see Gold, 'Gold'.

Gold's key status in international finance, supported by private financiers, states, and international organizations, shows actors believed gold prices still assessed policy credibility. Since only the dollar was convertible into gold, market pressure applied primarily to that currency.[49] This was reinforced by the fact that many contemporaries had come to believe in Triffin's dilemma, the idea that the US position was unsustainable because expanding the stock of dollars available to foreigners would increase the ratio of US foreign liabilities to US gold reserves, leading to a crisis of confidence.[50] Yet, the Triffin dilemma was only true because other countries believed that a significant amount of gold was necessary to back the dollar. As reiterated by Bordo and McCauley – and as proven by the fate of history after 1971 – the dollar did not need gold backing to be an international currency.[51]

Several recent studies have also sought to understand why gold remained an anchor for the entire international monetary system, even though it had lost its domestic monetary function. Jabko and Schmidt gather much evidence (especially from India, France and the United States) to show that contemporaries genuinely believed that gold was necessary for the functioning of the postwar international monetary system.[52] The references to gold at the Bretton Woods conference had revealed a shared belief that no country would agree to cooperate without an anchor that was independent of a country's domestic politics.[53] In the United States, bankers and Congress were also strongly in favour of maintaining a link between gold and the dollar to avoid too much government discretion.[54]

France most openly defended gold's necessity, especially in the 1960s when President De Gaulle denounced dollar hegemony, discussed returning to the gold standard, and pressured

[49] Because of the lack of convertibility, the price of gold on other domestic gold markets was seen as irrelevant for monetary policy. These domestic gold markets and the associated prices existed but it was seen only as the price of a commodity (for jewelry and industrial uses). See for example Von Hoang, 'Gold market' on the Paris gold market since 1950 and Bott, 'Gold' on the gold market in Zurich.
[50] Eichengreen, 'Bretton Woods'; Maes, *Triffin,* p.183-5.
[51] Bordo and McCauley, 'Triffin dilemma'.
[52] Jabko and Schmidt, 'Twilight of gold'.
[53] Eichengreen, 'Bretton Woods'.
[54] Rauchway, *The money makers,* p.203-26.

the US by converting dollars into gold. France had not waited for De Gaulle's famous 1965 speech to accumulate gold reserves, however. It had begun rebuilding its gold stock in the late 1940s. The official justification for French conversions of dollars into gold in the mid-1960s was that gold accumulation had paused in the early 1960s and that additional gold was needed to keep pace with the growth of currency in circulation.[55] Jabko and Schmidt stress that the French diplomatic position was not just a geopolitical move driven by anti-American sentiments but a genuine belief in the disciplining political virtue of gold reserves; quoting de Gaulle: 'Gold is a police force. It is extra-political.'[56]

On the basis of this argument, France pushed for a greater role for gold in international monetary cooperation. The main idea was to create an international asset that would be a basket of several currencies, with weights depending on the size of gold reserves. The proposal to issue international liquidity based on gold (Collective Reserve Units, or CRUs) was first formulated by the economist Edward Bernstein, but was put on the G10 discussion table by French officials in 1963.[57] The idea was sufficiently acceptable to be discussed by G10 experts, the Ossola Group, but it faced strong opposition from the US.[58] The Special Drawing Rights were eventually created in 1969, but without any reference to gold, and the US dollar was given a dominant role in the basket.[59] The Gold Pool and CRU proposals were formulated at the BIS and among G10 members. The absence of mechanisms to manage the gold–dollar link in the original Bretton Woods agreements led the system to evolve away from broad multilateralism toward monetary cooperation organized or initiated by a small group of advanced economies, effectively circumventing the Bretton Woods institutions.

[55] Monnet, 'Coopération','French'. In the 1960s, several other European countries (including Germany, Belgium and the Netherlands) had a gold cover ratio similar as, or higher to, the French one, that is above one third. See statistics presented in Monnet and Puy, 'Old habits'.
[56] Jabko and Smith, 'Twilight of gold', p.18.
[57] Bordo and James, 'Reserves and baskets' ; 'Monnet, 'Coopération','
[58] Toniolio and Clement, *Cooperation*, p.407.
[59] James, *Cooperation*, p.145.

Not only did some European countries see gold as a useful means of disciplining the US, but the US itself was reluctant to abandon it from 1944 to the end. In June 1962, Kennedy introduced a 'gold budget' for the foreign spending of federal agencies, the purpose of which was to reduce the outflow of dollars and thus strengthen the gold position of the United States.[60] The US Department of the Treasury and many of Nixon's advisers were still reluctant to break the gold link in 1971.[61]

The previous arguments have emphasised the role given to gold in international affairs and, in particular, that gold was perceived by private actors and states as a way of disciplining the fiscal and monetary policies of the United States. However, this in no way determined how much gold other countries should hold.

Monnet and Puy showed that under Bretton Woods, central banks followed gold standard rules, rebuilding gold holdings to back currency issuance. Postwar gold cover ratios eventually approached 40 per cent, similar to the gold and gold exchange standards. This coefficient was remarkably similar to interwar estimates.[62] By contrast, non-gold foreign reserves were not correlated with currency in circulation but with trade. The return to the prewar gold cover ratio was not explained by confounding factors but was the result of a deliberate policy. Moreover, the longer an institution has been on the gold standard, the tighter the link between gold and currency. These findings are not inconsistent with the large literature emphasizing the geopolitical dimensions of gold reserves under Bretton Woods (see above), but they suggest that the motives for gold accumulation were more widespread and structural, rather than driven solely by idiosyncratic geopolitical strategies of a small number of European countries.

[60] Jabko and Smith, 'Twilight of gold', p.18.
[61] Gowa, *Gold window*, p.28 and chp.3
[62] Monnet and Puy, 'Old habits'.

Although no comprehensive quantitative study in the 1950s or 1960s had shown that the holding of gold reserves simply followed the rules of the gold standard, some economists or central bankers under Bretton Woods were explicit that gold reserves were accumulated to cope with the growth of banknotes.[63] Most importantly, some central bank statutes still included references to a gold cover ratio. To this, we now turn our attention.

III- THE RESURGENCE OF LEGAL GOLD COVER RATIOS

Belgium's October 1944 monetary reform under Finance Minister Camille Gutt drastically reduced money in circulation to stop inflation.[64] However, it did not reintroduce the gold cover ratio suspended in May 1944. [65] Before the war, the National Bank of Belgium (NBB) held gold reserves equivalent to 40 per cent of banknotes. The suspension devastated Maurice Frère, NBB governor from 1944 to 1957. He actively rebuilt gold reserves to reintroduce a gold cover ratio, so that the actual ratio had reached 40 per cent by the mid-1950s.[66] A new law of 12 April 1957 then officially required that 'the Bank must have a reserve in gold at least equal to one third of the amount of its sight liabilities'. It also recognised the possibility of a return to the gold standard: 'The NBB is *temporarily* exempted from the obligation to redeem its notes in specie. The King may, by decree deliberated in Council of Ministers, *terminate this exemption.*'[67] In 1960, Frère hoped that Belgium could resume the convertibility of notes into specie (as in the gold standard) the 'day when the major countries also decide to make their currencies convertible [into gold]'.[68] It never happened.

Maurice Frère's views seem especially radical. This should not lead to the conclusion that the defense of gold cover ratios always revealed a deep willingness to come back to the

[63] Kriz, 'Gold in monetary affairs'. Holtrop, 'Method'.
[64] Van Praag, 'Assainissement'.
[65] Arrété-loi n° 5, 1st May 1944 (Moniteur in Bruxelles, 5 September 1944). See Bulletin d'Information et de Documentation de la Banque Nationale de Belgique, octobre 1944, p.8
[66] Frère, 'Restauration', p.107
[67] Article 4. See Aufricht, *Central bank legislation*, vol.2, p.99.
[68] Frère, 'Restauration', p. 107-108.

gold standard. The persistence of gold in central bank discourses and law could be motivated by many different factors and even contradicting beliefs, as argued by Jabko and Schmidt and illustrated by additional examples below.[69] It could be highly symbolic, mobilized in international and political discourse, and have tangible effects on gold reserves and law, while nevertheless failing to generate strong constraints on actual policy.

The US case shows why we cannot mechanically interpret legal cover ratios as a binding commitment to gold standard rules. At the core of the Bretton Woods system, the US reduced its legal gold cover ratio from 40 per cent to 25 per cent (for both banknotes in circulation and bank deposits at Federal Reserve banks) in 1945, and maintained it until 1968.[70] However, the cover ratio was far from binding for the US at the start of Bretton Woods, given that its gold reserves amounted to 60 per cent of banknotes in 1950.[71] In the mid-1960s, it had fallen below 30% however. The 1968 abandonment of the US gold cover, following 1965 Congressional debates, was motivated by the anticipation of future constraints on banknote expansion and it aimed at signalling that domestic requirements wouldn't jeopardize dollar convertibility for foreign central banks. Federal Reserve Chairman William McChesney Martin stated that this reform made clear US gold stock was available as international reserve.[72] It is worth noting that, although the gold cover ratio had not been a binding constraint on U.S. monetary policy, and contrary to the Secretary of Treasury, Chairman Martin was initially reluctant (in 1965) to abandon gold backing for banknotes (while agreeing to do so for bank deposits held at the

[69] Jabko and Schmidt, 'Twilight of gold', p.8.
[70] U.S. Congress, *An Act To Amend Sections 11(c) and 16 of the Federal Reserve Act, as Amended, and for Other Purposes*, Pub. L. No. 79-84, 59 Stat. 237 (June 12, 1945), and
An Act to Eliminate the Reserve Requirements for Federal Reserve Notes; and for United States Notes and Treasury Notes of 1890. Public Law 90-269. 82 Stat. 50 (March 18, 1968)
[71] Ramage, 'Gold cover'.
[72] Cited in Ramage, 'Gold cover', p.8.

central bank), because he wished to 'keep intact the symbolic tie between our circulating currency and gold.'[73]

The US and Belgian cases reveal how the persistence or resurgence of gold cover ratios could have different and ambiguous meanings in countries with a long history in the gold standard. In this respect, it is interesting to examine gold policy in some non-Western (capitalist) countries which, because of their previous colonial status, did not have a strong independent tradition of gold standard practices before the war. According to Helleiner, the Bretton Woods conference conveyed a strong 'developmentalist' spirit, a 'global New Deal' aimed in particular at promoting the development of non-Western countries (some of them former colonies) without constraining them by rigid rules.[74] These countries were well represented at Bretton Woods, in contrast to the continental European countries, which were either absent or represented by a small delegation from their government-in-exile.

In 1949, Argentine President Juan Perón caused an international sensation by announcing the abandonment of the Argentine central bank's gold cover.[75] However, Perón's decision did not trigger an international developmentalist revolt against gold cover ratios. Quite the contrary. Given the *zeitgeist* of the Bretton Woods conference, it may sound surprising that a number of non-European countries immediately turned to legal gold backing and built up substantial gold reserves after the war.

When Lebanon joined the IMF in 1947, its 1949 monetary law abolished the lira-franc link and set a 30 per cent gold cover ratio for banknotes. Given minimal gold reserves, intermediate targets were 10 per cent (1950) and 20 per cent (1951).[76] This was just after the

[73] U.S. Congress. House. Committee on Banking and Currency. *Repealing Certain Legislation Relating to Reserves Against Deposits in Federal Reserve Banks: Hearing before the Committee on Banking and Currency, House of Representatives, Eighty-Ninth Congress, First Session, on H.R. 3818*, February 1, 1965, p.41.
[74] Helleiner, *Forgotten foundations.*
[75] On Perón's decision, see Belini, 'El grupo Bunge', p. 47, and Rougier, 'El Banco central', p.140. IMF archives, 'Peron to Carry on Nationalizing; Hints He May Drop Gold Backing', Ref.: 291975, May 2 1949.
[76] This gold cover was much higher than the one of the Banque de Syrie et du Liban (5% then 10% starting 1937) that operated as the bank of issue under the French protectorate.

independence of the country and before Lebanon created its central bank (in 1963). The gold cover was one of the symbols of the new 'Merchant Republic' and post-colonial independence.[77] Acquiring gold was costly and not consensual however. The IMF archives keep newspaper articles that report 'stormy debates' at the Parliament of Lebanon in February 1950 after the Ministry of Finance had undertaken a policy to reconstruct gold reserves so that 'the proportion of gold in the cover of Lebanese currency is now 25.29 per cent as compared with 2 per cent six months ago', exceeding the intermediate requirements passed by law the preceding year.[78] Purchasing gold was indeed costly and diverted resources away from other state investments.

Egypt became independent in 1922 but remained a member of the Sterling Area until 1948. Its departure from the sterling area was followed by harsh retaliation from the United Kingdom: all the Egyptian foreign exchanges were blocked in London.[79] Instead of replacing sterling by dollars, this pushed the Egyptian government to accumulate gold reserves. It asked – but failed to obtain – 'that Egypt should be allocated a share of the United Kingdom gold reserves, since these reserves were accumulated on behalf of the whole sterling area to which Egypt was a party.'[80] No legal gold cover ratio was introduced for the National Bank of Egypt (the previous one had been abandoned in 1916 and replaced by requirements to hold sterling) but the bank quickly built large gold reserves and de facto respected a gold cover ratio in the 1950s.[81] Economists Hansen and Marzouk judged this as gold fetishism: gold reserves 'seem to have been considered untouchable, as a note cover!'.[82]

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[77] Safieddine, *Banking on the state*, p.95.
[78] IMF archives. 'During a Stormy Debate ...' Ref.: 289367, Feb. 4 1950.
[79] Avaro, 'Zombie', De Paiva Abreu, 'Egyptian sterling balances'. See Arslanalp et al., 'Gold', for an investigation of the link between gold reserves and economic sanctions in other contexts.
[80] IMF archives. 'Egypt's Balance of Payment...'. Jan. 1948' Ref: 362725. See also de Paiva Abreu, 'Egyptian sterling balances'.
[81] Bochenski, F. G.. Report on the economy of the Egypt. Economic department report ; no. E55, World Bank Group. http://documents.worldbank.org/curated/en/466121468038084316/Report-on-the-economy-of-the-Egypt-Arab-Republic-of
[82] Hansen and Marzouk, *Development*, p.195.

Central bank laws require cautious interpretation. They are path-dependent and subject to political hazards. Most important, law and practice often diverge. As France, Egypt, and Belgium (1944-1957) show, legal gold cover ratios were unnecessary to build reserves in practice.[83] However, as far as the symbol of gold is concerned, it is interesting to examine whether some countries other than Belgium and Lebanon changed their law after 1944 to give gold an explicit role. I therefore focus on new legal changes introduced after the Bretton Woods agreements in order to provide evidence that legal gold cover ratios were not just a thing of the past or a simple persistence of legal texts.

Table 1 shows the cases of countries that deliberately introduced or amended a gold reserve ratio in their central bank law after 1944. The table does not derive an argument from a comparison between these countries and others because, as explained above, the lack of change in central bank statutes after the war or the absence of a cover ratio has no unique interpretation. Moreover, the countries that do not appear in this table are missing for several reasons: either they were not members of the IMF, or they did not have a gold cover ratio, or they retained their prewar central bank legal ratio. The purpose is simply to show that the introduction of a gold cover ratio in law was not taboo after 1944; backing the monetary base with gold was not seen as contradicting the spirit of Bretton Woods and IMF membership.

[83] The French gold cover ratio was abolished by decree on 1 September 1939 and not reintroduced after the war; see Aufricht, *Central bank legislation*, vol.2, p.195.

TABLE 1: LEGAL GOLD COVER RATIOS INTRODUCED IN CENTRAL BANK LAWS AFTER 1944

Country	**Year of new central bank act or amendment**	**Ratio**
Gold only		
Belgium	1957 onwards (reinstate 1939 laws suspended in 1944)	1/3 of sight liabilities
India	1957 (amends 1934 Act)	fixed gold reserves (1.15 billion rupees).
Lebanon	1949	At least 10% in 1950, 20% in 1951 and 30% starting 1953 (of notes in circulation)
Portugal	1962 (amends 1931 Act)	25% of notes in circulation
South Africa	1944	25% of notes in circulation
Sweden	1948 (starting with laws no. 248 of May 28, 1948, several special regulations were passed to increase the right of issue of the central bank. Each of these laws refered to the gold reserve ratio of the 1934 central bank act)	50% of notes in circulation
Switzerland	1953	40% of notes in circulation
United States	1945 (amends 1916 Federal Reserve Act)	25% of notes in circulation; 25% of bank deposits at Federal Reserves
Gold and foreign exchange		
Burma	1952	25% of notes in circulation
Cuba	1948	25% of notes in circulation
Dominican Republic	1947	50% of notes in circulation (at least 25% of the reserves must be in gold)
El Salvador	1952	25% of sight liabilities
Iceland	1961	50% of notes in circulation
India	1957 (amends 1934 Act)	fixed gold reserves (1,15 billion rupees
Indonesia	1953	20% of sight liabilities
Mexico	1941 (amended in 1960)	25% of sight liabilities
Netherlands	1948 (1956)	50% of sight liabilities
Pakistan	1948 (amended in 1956)	30% of notes in circulation
Philippines	1948	10% of notes in circulation

Sources: Aufricht, *Central bank legislation*, vol.1 & 2.

IV- A PUZZLE: HOW COULD GOLD BACKING BE CONSISTENT WITH AUTONOMOUS MONETARY AND CREDIT POLICY?

Polanyi and Eichengreen famously argued that the gold standard became unsustainable because gold cover ratios acted as 'gold fetters' (a phrase used by J.M. Keynes) and these constraints on macroeconomic policy became incompatible with the rise of democracy and labour power

in the 1920s and 1930s.[84] In this view, the Bretton Woods consensus succeeded in 'embedding' liberalism by freeing governments and central banks from the rules of the gold standard. How can this popular argument be reconciled with the fact that countries still backed their money with gold and adopted, in practice or in law, gold cover ratios similar to those that prevailed during the gold standard?

One way to answer this puzzle is to recall the role of capital controls and devaluations under Bretton Woods. As most countries did in the 1930s after Britain and the US, it was possible to devalue, pursue expansionary fiscal and monetary policies, and then peg back to gold and maintain a gold cover ratio. Capital controls can provide freedom and delay devaluation by reducing market pressures.

However, devaluations were in fact rare under Bretton Woods.[85] Almost all IMF members devalued in 1949, but this was not common practice thereafter. For example, among Western European countries – which had a longer history on the gold standard before WWII – only Finland and France devalued in 1957 and 1958 respectively.[86] The devaluation of the British pound in November 1967 was followed by devaluations in Spain, New Zealand, Denmark and Israel. Elsewhere, Paraguay devalued its currency three times in the 1950s, but this is the exception that proves the rule. Mexico devalued in 1954, Turkey in 1960, the Philippines in 1965 and India in 1966. To sum up, while several countries devalued once between 1949 and 1971, repeated or serial devaluations were by no means a common policy choice.

The 1949 global devaluation certainly helps to explain how countries were able to achieve gold cover ratios despite limited gold reserves, but it remains a mystery how most countries, especially in Western Europe, experienced their highest economic growth rates ever

[84] Polanyi, *Great transformation*; Eichengreen, *Golden fetters.*
[85] Bordo, 'Bretton Woods'.
[86] De Vries and Horsefield, *International Monetary Fund*, Table 4, p.116 et al., as well as monthly volumes of *International Financial Statistics*, section on Article VIII Status.

(fuelled by accommodative fiscal and credit policies) while being constrained by prewar gold cover ratios. So the answer lies elsewhere.

The argument defended in the rest of this article is that part of the answer is provided by combining and augmenting two recent strands of literature that have shed light on money and credit in the long run on the one hand[87], and on central bank policies during the Bretton Woods period, on the other. [88] The following sections summarise each of these contributions in turn, provide additional quantitative or qualitative support for them, and finally connect them.

V- THE POSTWAR DISCONNECT BETWEEN MONEY AND CREDIT GROWTH

Schularick and Taylor studied money and credit evolution in 15 advanced economies since 1870. They emphasize that bank assets to GDP reached unprecedented levels in the 1970s, and money-credit disconnect began just after World War II, not after Bretton Woods ended.[89] Their initial interest did not lie in Bretton Woods but historians of Bretton Woods can also find some interesting patterns in their work. They especially show a striking figure (n°2) of the (log of the) ratio of bank loans to broad money. This ratio is almost stable from the late 19th century to the Great Depression. It fell during the Great Depression and World War II, but then experienced a continuous rise from 1945 to the present. The ratio of bank loans (i.e. credit) to GDP grew fast to catch up with prewar level whereas the ratio of money to GDP remained almost stable under Bretton Woods.

Schularick and Taylor's definition of money is broader than the one that was legally backed by gold reserves. It includes demand deposits held at commercial banks. In contrast, gold standard practices and central bank laws required monetary authorities to hold gold reserves (or foreign exchange) in proportion to the amount of banknotes in circulation.

[87] Schularick and Taylor, 'Credit booms',
[88] Monnet, *Controlling credit.*
[89] Schularick and Taylor, 'Credit booms',

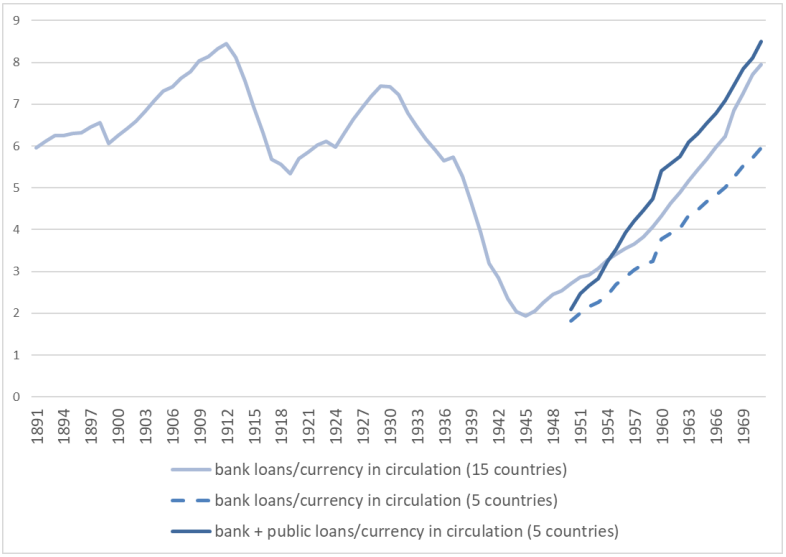
Sometimes gold cover ratios were also expressed as proportion of the sight liabilities (demand deposits) held by commercial banks with the central bank (see Table 1). Therefore, series for currency in circulation and bank reserves at the central bank had to be newly compiled in order to construct Figures 1 and 2 (see appendix).

Figure 1 shows bank loans to currency ratios. Figure 2 shows loans to M0 (currency plus bank reserves at central banks). Data for 15 countries with complete currency series were compared with Schularick and Taylor's credit series or more comprehensive ones, when available (see sources in the appendix). The data cover the US, Canada, Australia, Japan, Mexico and 10 European countries.

Although the loan-to-currency ratio experienced earlier booms and busts, the 1930s-1940s decline and subsequent Bretton Woods growth were unprecedented. The ratio fluctuated around a stable mean before 1939 but increased fourfold between 1945 and 1971. This implies that, on average, the ratio of bank loans to currency in circulation increased by 6 per cent each year (Figure 1). In other words, even if currency in circulation remained at the same level as the previous year, credit could grow by 6 per cent a year. This provided a considerable margin of manoeuvre for fast-growing economies.

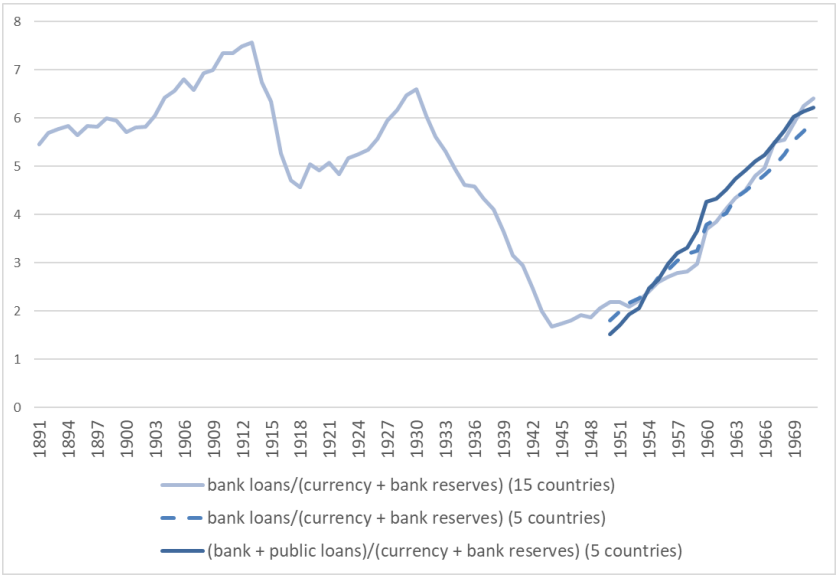
The pattern is similar in Figure 2 when we include the reserves at the central bank in the denominator of the ratio. The ratio is mechanically lower because the denominator is bigger, but the growth rates are in fact higher (see comparison of the growth rates in Table 2), equal to 8 per cent on average under Bretton Woods, compared to 2 per cent over the full sample since 1890. With the exception of the United States (and Canada and Australia for some decades), the bank reserves at the central bank are always much smaller than the banknotes in circulation.

FIGURE 1: EVOLUTION OF THE AVERAGE RATIO OF CREDIT OVER CURRENCY IN CIRCULATION, 1890-1971. SAMPLE OF 15 COUNTRIES.



Notes: the 15 countries include Canada, Japan, Australia, USA, Belgium, Norway, Italy, Netherlands, Spain, Sweden, Finland, France, Mexico, Switzerland and the UK. See the text for the definition and coverage of data on public loans from Degorce, 'Public credit'. Sources are presented in the data appendix.

FIGURE 2: EVOLUTION OF THE AVERAGE RATIO OF CREDIT OVER CURRENCY IN CIRCULATION AND BANK RESERVES AT THE CENTRAL BANK, 1890-1971. SAMPLE OF 15 COUNTRIES.



Notes: same sample and definitions and in Figure 1. Sources are presented in the data appendix.

Schularick and Taylor's series likely underestimate credit growth driven by state intervention during Bretton Woods. Postwar government intervention developed long-term credit through government-owned institutions issuing guaranteed bonds ('public credit'). These institutions, mostly nonexistent before the 1920s, expanded after 1945. In France, for example, over two-thirds of long-term credit came from public institutions.[90] Depending on the country, some of the public credit institutions were nevertheless considered as 'banks' in the official statistics and may therefore appear in the figures of Schularick and Taylor. However, this was not done systematically. While more research is still needed on this issue, a starting point is Degorce's recent study that complements the Schularick-Taylor dataset with public credit after 1945 for some countries where sources were available. Unfortunately, however, Degorce's public credit series have only a limited overlap with our other credit data, as it includes a large number of Asian and American countries.[91] As a result, we are only able to construct a ratio of total loans (bank + public credit) to currency in circulation for 5 countries (the US, Norway, Italy, Mexico and France). Although limited, the results are interesting and confirm that when public credit is taken into account, the increase in credit relative to currency in circulation is even more pronounced (see figure 1).[92] In this sample of five countries, the ratio of bank credit to currency increased less on average than in the sample of 15 countries. It tripled between 1947 and 1971. On the other hand, the ratio of total credit (bank credit + public credit) to money in circulation in these five countries has increased more than fourfold. As shown in Table 2, this corresponds to a 7 per cent annual increase in the ratio of total credit against a 5.9 per cent annual increase in the ratio of bank loans.

[90] Monnet, *Controlling credit*, chp.6.
[91] Degorce, 'Public credit'.
[92] This difference is less pronounced in Figure 2 because of the United States. The US is the country with the smaller share of public credit in total credit but the largest volume of bank reserves at the central bank relative to banknotes in circulation.

Table 2 shows average growth rates of loan-to-currency ratios across periods (in per cent). During Bretton Woods (6.1), this exceeded the classical gold standard (2.6) by more than double. Including central bank reserves, the difference was larger: 8.3 in Bretton Woods versus 3.1 in the gold standard. It is also worth noting that the increase in the credit-to-currency ratio during the gold standard period was concentrated in the first decade of the twentieth century, whereas the ratio rose continuously over a period of 25 years during the Bretton Woods period. The growth rate of the ratio was much lower in the interwar period. It declined steadily during the Great Depression.

TABLE 2: GROWTH RATES OF RATIO OF CREDIT OVER CURRENCY IN CIRCULATION AND MONEY. BREAKDOWN BY PERIOD. SAMPLE OF 15 COUNTRIES, 1890-1971.

Time period	Average growth rate of the ratio of loans to currency in circulation	Average growth rate of the ratio of loans to M0 (currency in circulation + bank reserves at the central bank)	Average growth rate of the ratio of loans to M1 (currency in circulation + demand bank deposits)
Classical gold standard (1890-1913).	2.6	3.1	1.7
Interwar (1919-1938)	0.5	0.8	0.7
Interwar gold standard (1925-1936)	-0.6	-0.4	-0.3
Bretton Woods (1945-1971)	6.1	8.3	5.0
Bretton Woods, 1st half (1945-1959)	6.5	7.7	5.6
Bretton Woods, 2nd half (1960-1971)	5.7	9.1	4.2
Full sample average	1.3	2.2	1.1
Bretton Woods, with (and without) public credit. Limited sample of 5 countries.	*7 (5.9)*	*7 (5.9)*	

Notes: same countries as in Figure 1, except Norway that was excluded because of lack of data on M1 before 1914. Sources are presented in the data appendix.

Table 2 also shows the ratio of credit to M1, i.e. currency in circulation plus short-term deposits with commercial banks.[93] The latter were never required to be backed by gold, neither under the gold standard nor under Bretton Woods. Unsurprisingly, the growth rate of the loan-

[93] In order to obtain a more homogeneous definition of M1 across countries than in the study of Schularick and Taylor, different series have been collected (see appendix for data sources). The trends and main conclusions are similar when using these data or Schularick and Taylor's.

to-money ratio is lower when M1 is the denominator (right-hand column of Table 1). Bank deposits grew faster than currency in circulation, especially in the second half of Bretton Woods.

The higher growth rate of credit relative to money (either currency in circulation or broad money) in the Bretton Woods era was due to a multiplicity of factors. It includes changes in the credit system due to the rise of financial regulation, changes in the access to banking services and the recovery of credit growth after the major negative shocks experienced by the banking systems during the Great Depression and the war. First, the difference between the growth of bank credit and bank deposits was driven by a change in bank leverage. The increase in banking regulation under Bretton Woods significantly reduced the average capital ratio of banks. Banks were safer (and some became state-owned in several countries) and therefore needed to hold less capital to attract depositors.[94] Second, postwar banks reduced their holdings of Treasury bills (which represented a disproportionate share of their balance sheets during the war) and replaced them with loans.[95] Thus, for the same amount of money (i.e. currency and bank liabilities), loans to firms grew faster. More generally, bank credit had contracted sharply during the Great Depression and again under wartime economic controls, whereas the monetary base continued to expand in response to wartime inflation. Postwar credit growth was therefore initially a catch-up phenomenon. Third, the fact that bank deposits grew faster than currency in circulation can be explained by the bancarisation of the economy during this period. Banking services were available to a large part of the population. Fourth, banks and (especially) public credit institutions began to finance themselves through (often government-guaranteed) bonds, which may not imply money creation. Last, in the final years of Bretton Woods, rising U.S. inflation after 1965 and the accumulation of trade surpluses in some advanced economies, such as Germany, may have further reinforced the disconnect between credit and money growth, as

[94] Jorda et al, 'Bank capital redux' document the decline in bank capital ratios after the 1930s.
[95] Monnet and Vari, 'Liquidity dilemma'.

credit expansion could be used more easily to stimulate domestic activity in surplus countries than in countries facing balance-of-payments deficits. This, however, was conditional on the presence of effective capital controls, which made domestic credit controls operative and limited the transmission of imported inflation. As U.S. inflation increasingly spilled over and capital controls gradually lost their effectiveness, Germany moved to a floating exchange rate vis-à-vis the dollar in September 1969 in order to regain control over domestic credit expansion.[96]

VI- THE FOCUS OF CENTRAL BANKS AND THE IMF ON CREDIT CONTROLS

If the growth rate of credit diverged from the growth rate of money, which of the two did central banks care about? We now have several studies of postwar central banking which show that central banks were indeed more concerned with credit than with money during this period. In particular, the amount of currency in circulation seems to have been of little relevance for macroeconomic management, at least from the late 1940s onwards. The postwar monetary reforms, aimed at curbing the very high postwar inflation rates, were about absorbing currency in circulation. But once inflation had been brought under control, the priority for governments and central banks was to expand credit while maintaining a moderate rate of inflation.

'Credit control' became the mantra of Bretton Woods central banks and governments. This took a variety of forms. On the government side, as noted above, many policies were designed to expand long-term credit by guaranteeing the debt of state-owned credit institutions. Central banks supported these developmental credit policies by keeping interest rates low and providing ample liquidity (including long-term loans) and guidelines for allocating credit to priority sectors.[97]

[96] Gray, 'Germany'.
[97] See Monnet, *Controlling credit*, chp.7, for a review of these policies in Western Europe, Park, *Spending without taxation*, on postwar Japan, and Monnet, 'Credit policies'.

When inflation rose, central banks directly controlled bank credit through growth limits, capital controls, or liquidity ratios forcing banks to reduce lending. These techniques were used in all countries, including where the central bank was a new institution.[98] As exemplified by the influential Radcliffe report published in 1959 about the Bank of England's policy, it reflected a widespread international consensus that the money supply was impossible to manage and that monetary authorities should instead focus on direct controls of credit.[99] These were often "selective," exempting housing credit where rebuilding was needed and export credit during trade deficits. Recent studies find significant effects of credit restrictions on inflation and macro variables before the early 1970s.[100] Financial liberalization thereafter made administrative controls harder to enforce.

Thus, 'credit control' was seen as the normal way to influence the business cycle during the Bretton Woods period. Central banks used quantitative tools (administrative measures) to make credit abundant during expansions or restrict it to fight inflation and/or balance of payments deficits. Recent quantitative studies on several countries cited above show that there was no strong theoretical background to the central bank doctrine of credit control during this period. It was very much based on banking practice and intuition, such as the credo 'loans make deposits', and basic statistical correlations. By contrast, the IMF attempted to adopt a more theoretical approach to credit control, as far as international issues were concerned.

In line with the practices of national central banks, credit also became the leading indicator used by the International Monetary Fund to assess balance of payments equilibrium. From the late 1950s to the 1990s (the initial model was later extended), the IMF's main approach to forecasting the balance of payments deficit and recommending corrective monetary or fiscal

[98] Fousek, *Central banking*; Hodgman, *Monetary Policies*; Monnet, *Controlling credit*; Monnet and Vari, 'Liquidity dilemma'; Sen, *Central Banking*.
[99] Capie, *Bank of England*, chp.3.
[100] Country case studies include Jonung, 'Credit controls' on Sweden and, more recently, Monnet, 'Monetary policy' on France, Aikman et al. 'Radcliffe' and Banerjee 'Fiscal policy'on the UK, and Galati et al. 'Credit restrictions' on the Netherlands.

policies used the net growth of domestic credit ('domestic credit expansion' or DCE) as the key variable.[101] This model was introduced in 1957 by Jacques Polak, then Deputy Director of the IMF's Research Department, who became Director the following year. Jacques Polak, formerly of the Dutch Bretton Woods delegation, worked for the IMF on Mexico's 1955 crisis. He found money-to-GNP ratios couldn't predict balance of payments deficits, but credit variables could.[102] Empirical tests in other countries proved successful, and Polak published a seminal theoretical article in the IMF Staff Papers in 1957.[103] The model was only based on quantities (domestically funded credit) and disregarded the role of interest rates. His conclusion was very similar to what individual central banks were writing at the time: 'for purposes of monetary analysis and monetary policy there is a clear gain in clarity if the responsibility is pinpointed on the credit expansion'.[104] The IMF immediately adopted the Polak model. Its 1958 recommendations led France to adopt strict credit ceilings.[105] The term 'domestic credit expansion' was copied by central banks, including the Bank of England.[106]

As both the literature on domestic credit controls and the study of the Polak model reminds us, there were still some balance of payments constraints under Bretton Woods, and central banks often had to restrict the supply of credit in order to stabilise inflation and the exchange rate. So the decoupling of money (and gold) from credit does not mean that the Bretton Woods system had removed all constraints. But, these constraints were no longer linked to the flow of gold.

[101] Polak, 'The IMF model'; Boughton 'Jacques Polak'.
[102] James, *Monetary cooperation*, p.140.
[103] Polak, 'Monetary analysis'.
[104] Ibid, p.13.
[105] Monnet, *Controlling credit*, p.73.
[106] Capie, *Bank of England*, p.452. See also "Domestic credit expansion." Bank of England Quarterly Bulletin 9.3 (1969): 363-82.

VII- GOLD RESERVES WERE CORRELATED WITH MONEY BUT NOT WITH CREDIT

The following analysis uses annual panel data to investigate whether gold reserves were as correlated with credit as they were with currency in circulation. In Table 3, I simply run the same estimations as in Monnet and Puy, where the ratio of gold reserves to GDP is the dependent variable, while adding bank credit to GDP as an additional variable.[107] The estimation sample is limited to the Bretton Woods period, but includes many more countries than the long-run annual credit series shown in Figure 1. Consistent data were collected for 38 countries.[108] Figure A.1 in the Appendix shows that, in this larger sample as well, bank credit grew much faster than currency in circulation over the Bretton Woods period; the ratio between the two shifted from 3 to 6.[109] The credit data are taken from the International Financial Statistics volumes and represent domestic credit to the non-financial sector. The sources of all other variables are listed in the article of Monnet and Puy.[110] All macroeconomic aggregates in Table 3 are scaled to GDP.

Columns 1 and 2 present results from a pooled panel, while columns 3 and 4 include country fixed effects (with standard errors clustered at the country level and year-fixed effects). Columns 1 and 3 focus on a limited set of variables. This includes a country's total trade, given that the official doctrine of the IMF under Bretton Woods required countries to hold international reserves (including gold) in proportion to their total trade with the rest of the world (see above). Columns 2 and 4 include a larger set of controls, including bank deposits and proxies for financial openness.

[107] Monnet and Puy, 'Old habits'.
[108] It was not possible to locate data on bank reserves at the central bank for these 38 countries.
[109] The increase in the ratio is smaller than in Figure 1 because some developing economies are included in the sample. As shown in Monnet and Puy, these countries were also the ones with, on average, a lower correlation between gold and currency.
[110] Ibid.

There is no significant correlation between gold reserves and credit with country fixed effects (columns 3 & 4). In a pooled panel, the coefficient is significant but very small (column 1) and becomes insignificant when control variables are included (column 2).[111] On the other hand, the relationship between gold reserves and currency in circulation is always significant and large (between 30 and 40 per cent) in all specifications, as previously found by Monnet and Puy.

A potential concern is the collinearity between credit and money (even though Figure 1 and Table 2 show that their growth rates were very different over the period). Table 4 therefore includes only credit, excluding money in circulation. The credit coefficient becomes significant in the pooled panel, although it is negligible when controlling for covariates (0.03 in column 2). However, when we move to fixed-effects regressions (which take into account within-country variations over time), the credit coefficient remains insignificant and negligible.

[111] When controlling for other macroeconomic variables, the coefficient on credit is very far from being significant at conventional levels. In column 2 (pooled panel), the t-stat is 1.03 and p-value 0.306. In column 4 (fixed-effects), the t-stat is -0.65 and p-value 0.516. To visualize the basic cross-country relationships reported in Table 1, Figures A2 to A5 in the Appendix present scatterplots of the correlations between gold and currency, and between gold and credit (all variables scaled by GDP). These correlations are computed using country-level averages over the full Bretton Woods sample. Figures A2 and A3 show the unconditional correlations (0.58 between gold and currency and 0.10 between gold and credit, respectively) while Figures A4 and A5 display the conditional correlations obtained using the Frisch–Waugh–Lovell theorem. Specifically, they report the correlation between gold and currency conditional on credit, and between gold and credit conditional on currency, which are equal to 0.44 and 0.06, respectively.

TABLE 3: GOLD RESERVES ARE CORRELATED WITH CURRENCY IN CIRCULATION BUT NOT WITH CREDIT (SAMPLE OF 38 COUNTRIES, 1950-1970)

Gold reserves	(1) Pooled	(2) Pooled	(3) Country-fixed effects	(4) Country-fixed Effects
Trade	0.0413***	-0.0195*	0.0141	-0.0145
	(0.0073)	(0.0109)	(0.0204)	(0.0237)
Currency	0.398***	0.429***	0.367**	0.304*
	(0.0394)	(0.0361)	(0.140)	(0.162)
Credit	0.0635***	0.0121	-0.0301	-0.0233
	(0.0120)	(0.0118)	(0.0316)	(0.0358)
Deposits		0.225***		0.0321
		(0.0270)		(0.0659)
Exchange rate premium		-0.119		-0.122
		(0.142)		(0.150)
Capital account openness		0.0333***		0.0159
		(0.0053)		(0.0097)
Current account openness		0.0959***		0.0128
		(0.0269)		(0.0377)
FX flexibility		-0.128***		-0.0327
		(0.0262)		(0.0304)
Population		-0.900***		-1.863
		(0.134)		(1.202)
Constant	-3.117**	11.05***	0.476	31.25
	(1.385)	(2.689)	(0.989)	(19.79)
Observations	713	713	721	713
R-squared	0.418	0.586	0.145	0.190
Country FE	NO	NO	YES	YES
Year FE	YES	YES	YES	YES
Number of country	38	38	38	38

Gold reserves, trade, currency and deposits are scaled by GDP. *Capital account and current account openness* are de jure indices built by Quinn and Toyoda based on IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. A higher value of these indices denotes higher openness. *Population* is the logarithm of total population. The *exchange rate premium* is the difference between the official and the black market exchange rates. If the premium is positive, the exchange rate is overvalued and a devaluation is expected. *FX flexibility* is an index that measures how much countries are pegging to the dollar, with a higher value denoting a more flexible peg. These two variables were built by Reinhart and Rogoff. See Monnet and Puy, 'Old habits' for further description of the variables and their sources. All specifications include year-fixed effects. Columns 3 and 4 include country-fixed effects. *** p<0.01, ** p<0.05, * p<0.1

TABLE 4: EXCLUDING CURRENCY IN CIRCULATION FROM THE ESTIMATIONS (SAMPLE OF 38 COUNTRIES, 1950-1970)

Gold reserves	(1) Pooled	(2) Pooled	(3) Country-fixed effects	(4) Country-fixed Effects
Trade	0.0579***	0.0137	0.0030	-0.0243
	(0.0078)	(0.0104)	(0.0198)	(0.0295)
Currency		EXCLUDED		
Credit	0.102***	0.0307**	-0.0127	-0.0133
	(0.0143)	(0.0147)	(0.0275)	(0.0338)
Deposits		0.291***		0.0788
		(0.0308)		(0.0708)
Exchange rate premium		-0.0406		-0.204*
		(0.106)		(0.121)
Capital account openness		0.0311***		0.0139
		(0.0056)		(0.0096)
Current account openness		0.0543**		-0.00242
		(0.0268)		(0.0426)
FX flexibility		-0.0766***		-0.0280
		(0.0263)		(0.0252)
Population		-0.455***		-3.429***
		(0.132)		(1.160)
Constant	-1.230	4.980*	3.338**	58.96***
	(1.457)	(2.741)	(1.355)	(19.20)
Observations	713	713	743	713
R-squared	0.310	0.478	0.003	0.120
Country FE	NO	NO	YES	YES
Year FE	YES	YES	YES	YES
Number of country	38	38	38	38

Notes: same specifications and sources as in Table 3.

VIII- CONCLUSION

When navigating uncharted waters, policymakers often follow the rules of the past. But when the world has changed, the consequences of following the same rules are different. Gold played a crucial international role during the Bretton Woods system, from 1944 to 1971. It became part of international law for the first time, it was at the centre of international monetary cooperation, and the dollar price of gold in London became the barometer of international confidence in US macroeconomic policies. Gold also played a highly symbolic domestic role in backing currency in circulation, as in the gold standard. For non-U.S. countries, however, gold backing had little

direct impact on domestic economic outcomes (aside from the opportunity cost of holding gold reserves) and did not compromise the autonomy of central bank policies. This was due to the postwar disconnect between the growth rates of credit and of currency in circulation, a disconnect reinforced by central banks' emphasis on credit control rather than on the money base.

Gold pressure on domestic policy applied essentially to the United States. But this had important international consequences. This stemmed not from the US gold cover ratio but from its unique position at Bretton Woods' center (Triffin dilemma), combined with gold's renewed international role through the London market. Other countries' persistent preference for gold backing thus had repercussions for U.S. policies, which in turn shaped the international monetary system (e.g., the Gold Pool, U.S. capital controls and central bank swap lines). In sum, despite its ubiquity, gold backing played only a limited role in shaping domestic macroeconomic policies under Bretton Woods, while simultaneously structuring international monetary relations in crucial ways.

This explains why ending gold's monetary status in the 1970s was no watershed for domestic central bank policy but transformed international monetary relations. The gold-money correlation disappeared after the US closed its gold window.[112] Central bank instruments and monetary policies remained unaffected, however. The liberalisation of financial markets and the gradual withdrawal of government intervention from the credit system were to have a much greater impact on central bank instruments and objectives.

[112] Monnet and Puy, 'Old habits'.

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APPENDIX: DATA SOURCES

Data on currency in circulation comes from Mitchell (2013), except for the United Kingdom (Cappie, Webber (1985)), Sweden (Edvinsson, Ögren (2014)) and Norway (Klovland, (2004)).

Data on credit comes from Jordà et al. (2017), except for France (Baubeau et al. 2021; Bonhoure et al. 2024), Italy (De Bonis et al, (2013)), Spain (Martín-Aceña and Pons, 2005) and Mexico (INEGI (2009)).

Data on M1 comes from Jordà et al. (2017), except for Belgium (Delbeke (1988)), Canada (Metcalf et al (1998)), France (Saint-Marc (1983)), Italy (Amidei et al (2016)), Mexico (INEGI (2009)), Norway (Klovland, (2004)), Spain (Martín-Aceña and Pons, 2005), Sweden (Edvinsson, Ögren (2014)), USA (Balke, Gordon (1986)), and the UK (Bank of England, "A millenium of macroeconomic data").

Data on bank deposits at central banks come from the following sources:

Australia : URL : https://www.rba.gov.au/statistics/frequency/occ-paper-8.html

Canada : URL : https://www150.statcan.gc.ca/n1/pub/11-516-x/sectionj/4147440-eng.htm#2

Italy: Fratianni & Spinelli (1997)

Japan : Bank of Japan balance sheet, kindly shared by Masato Shizume

Norway: URL : https://www.norges-bank.no/en/news-events/news/Balance-sheets/Norges-Banks-balance-sheets-from-1817-to-the-present/

UK: Bank of England, "A millenium of macroeconomic data"; BoE balance sheet

USA: Bao et al. (2018)

Data from all other countries (Belgium, France, Mexico, Netherlands, Spain, Sweden, Switzerland) are from Bazot et al. (2024).

APPENDIX: ADDITIONAL FIGURES

FIGURE A.1: RATIO OF BANK LOANS (CREDIT) TO CURRENCY IN CIRCULATION (BANKNOTES). SAMPLE OF 38 COUNTRIES, 1950-1970.

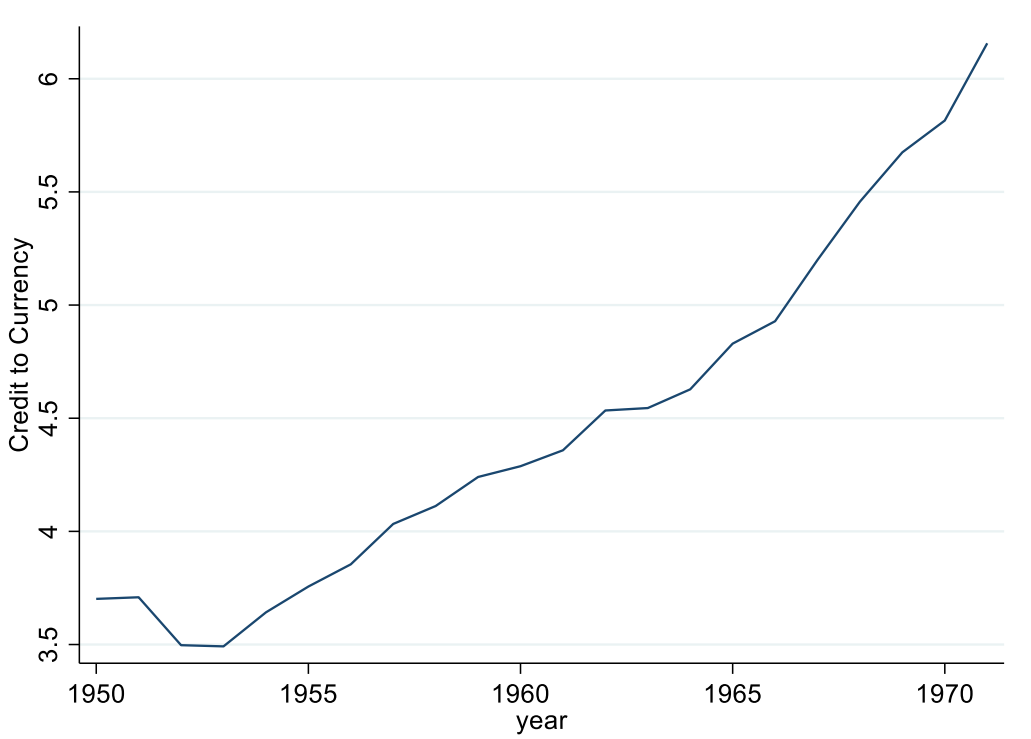


FIGURE A.1: UNCONDITIONAL CORRELATION BETWEEN GOLD RESERVES (TO GDP) AND CURRENCY IN CIRCULATION (TO GDP). AVERAGE VALUE PER COUNTRY. (SAMPLE OF 38 COUNTRIES, 1950-1970)

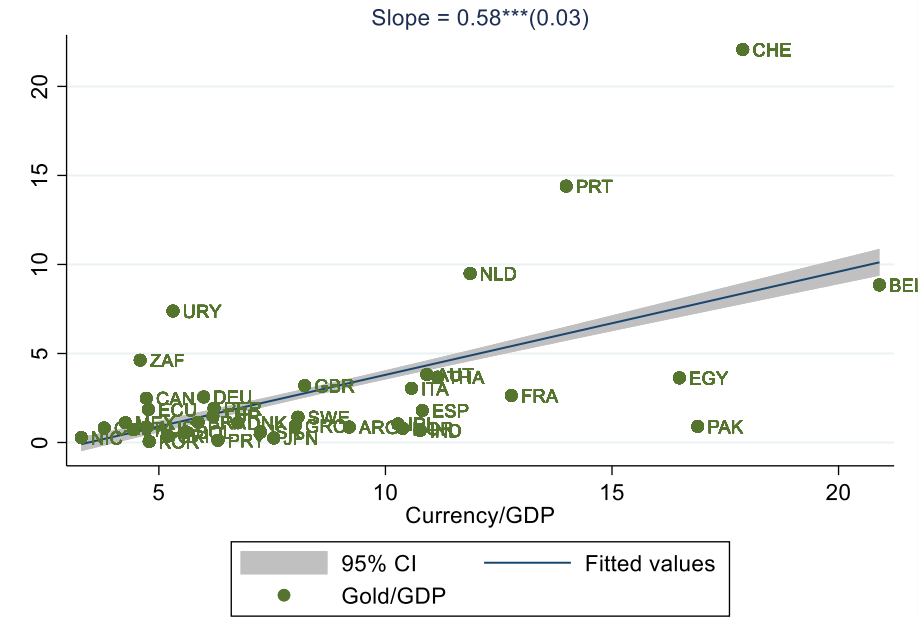


FIGURE A.2: UNCONDITIONAL CORRELATION BETWEEN GOLD RESERVES (TO GDP) AND CURRENCY IN CIRCULATION (TO GDP). AVERAGE VALUE PER COUNTRY. (SAMPLE OF 38 COUNTRIES, 1950-1970)

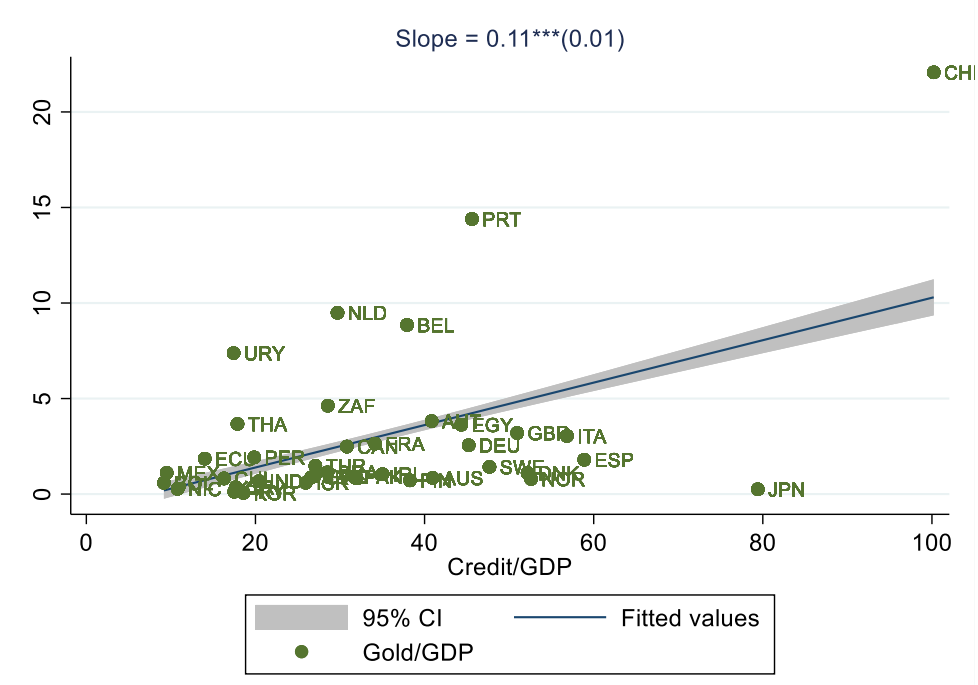


FIGURE A.3: CORRELATION BETWEEN GOLD RESERVES (TO GDP) AND CURRENCY IN CIRCULATION (TO GDP), CONDITIONAL ON CREDIT (TO GDP). FRISCH–WAUGH–LOVELL. AVERAGE VALUE PER COUNTRY. (SAMPLE OF 38 COUNTRIES, 1950-1970)

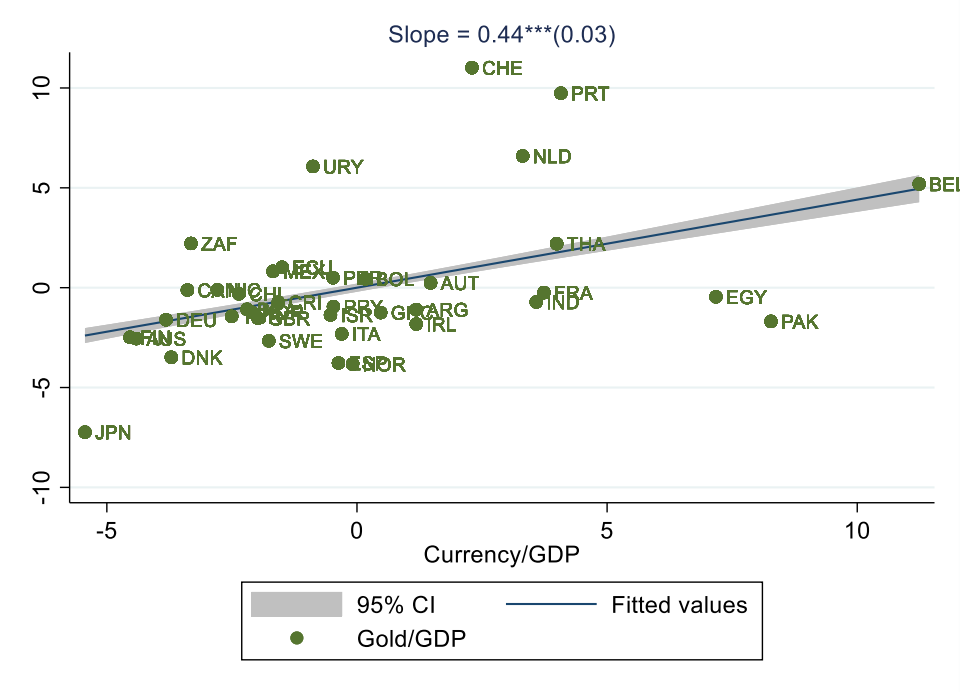
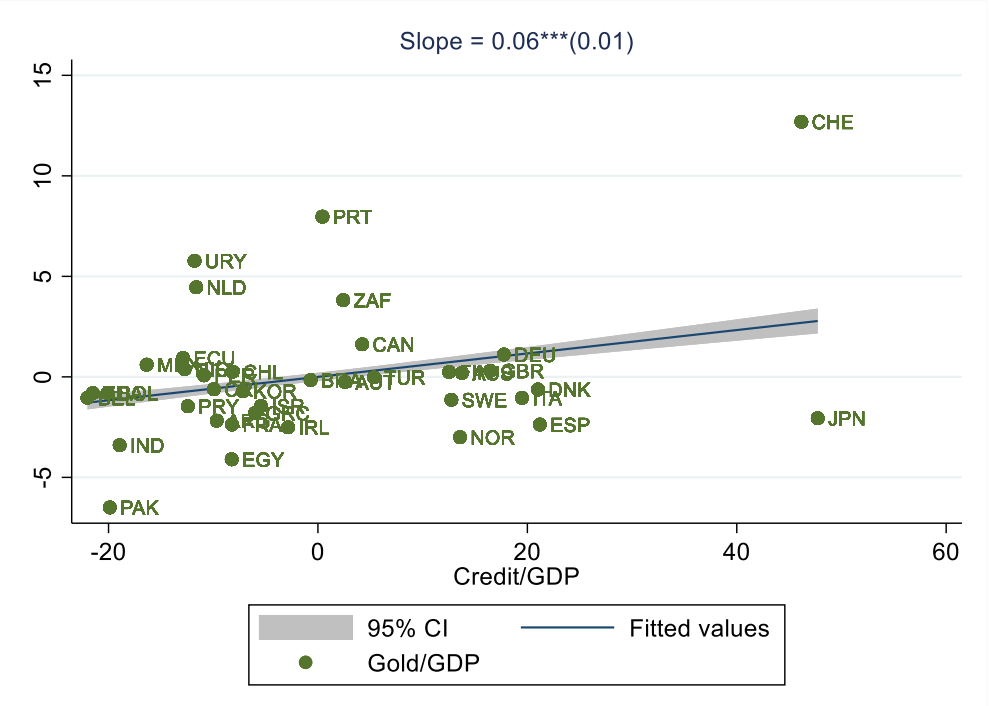


FIGURE A.3: CORRELATION BETWEEN GOLD RESERVES (TO GDP) AND CREDIT (TO GDP), CONDITIONAL ON CURRENCY IN CIRCULATION (TO GDP). FRISCH–WAUGH–LOVELL. AVERAGE VALUE PER COUNTRY. (SAMPLE OF 38 COUNTRIES, 1950-1970)



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