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The Future of Offshore Dollar Creation: Four Scenarios for the International Monetary System by 2040

Steffen Murau, Joe Rini, Armin Haas

**IASS Potsdam, in collaboration with Weatherhead
Center for International Affairs, Harvard University**



Summary

In order to sketch the possibility space for the future setup of the International Monetary System (IMS), this paper develops four different scenarios that outline potential outcomes of the IMS's evolution by 2040. These scenarios derive from the analytical exercise of adopting a Money View perspective of today's institutional shape of the IMS. The paper argues that the IMS's current setup crucially relies on the supply of US Dollar-denominated credit money forms issued by private and public institutions outside the United States—through Eurodollar deposits, central bank swaps as well as 'shadow money forms' created by non-banks such as overnight repurchase agreements, money market fund shares and foreign exchange swaps. As this 'realm' of offshore dollar creation forms the heart of the present IMS, the four scenarios project potential institutional developments in coming decades following different trajectories. The Continued Dollar Hegemony scenario depicts the sustained dominance of private international money creation via offshore dollars within the Pax Americana. The Competing Monetary Blocs scenario envisions the US, the EU, and China as three gravitational centers with private international money creation in the blocs' peripheries via offshore dollars, offshore euros and offshore renminbi. In the International Monetary Federation scenario, countries have created a strong publicly organized IMS, comprising a multilateral framework of one international and several regional clearing unions, based upon Keynes' ideas for an International Clearing Union. Finally, the International Monetary Anarchy scenario entails the post-crisis emergence of a non-system with a substantial breakdown of public and private international monetary cooperation and creation.

Keywords: International Monetary System; Money View; offshore; shadow money; Eurodollars; MMF shares; repos; foreign exchange swaps; central bank swap lines; offshore; dollar hegemony; currency competition; Clearing Union; monetary anarchy.

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Steffen Murau, Joe Rini and Armin Haas,
Potsdam and Cambridge, MA

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1. Introduction

The 2007-9 Financial Crisis had a massive impact on the monetary and financial system—both via the runs on a multitude of financial institutions, in particular shadow banks, and the public interventions reacting to these runs (Brunnermeier 2009, Mehrling 2011, Murau 2017a). Moreover, as today's era of financial globalization is shaped by the global entanglement of central banking, commercial banking and shadow banking, the crisis had a major effect on the International Monetary System (IMS) (cf. Murau 2018). In response to the defaulting market for asset-backed commercial papers in late 2007, the Federal Reserve set up emergency swap lines with other non-US central banks and expanded them massively as the crisis continued to unfold (McDowell 2016). After the crisis, some of these swap lines were made permanent and unlimited in their volume—notably those between the Federal Reserve and five other central banks of closely allied countries ('C6 swap lines'): the European Central Bank (ECB), the Bank of England (BoE), the Bank of Japan (BoJ), the Bank of Canada (BoC) and the Swiss National Bank (SNB). The C6 swap lines are the major innovation to the IMS that emerged out of the crisis (Mehrling 2015b), and are now considered a key element of the emerging Global Financial Safety Net ('GFSN') (Henning 2015, IMF 2016).

Today, as the result of the crisis and the political attempts to contain it, the IMS has a new unprecedented institutional setup. The C6 swap lines, centered around the Fed as the global backstop, are its key feature. But how stable and bullet-proof will this newly emerged system prove in the future? Is the IMS resilient and able to persist within the framework of the contemporary GFSN? Or did the bailouts and the introduction of the C6 swap lines only postpone a system-changing financial crisis by maintaining major systemic flaws or even creating new ones? These questions, of course, cannot be answered with certainty. The future is by definition unknowable. What we do know, however, is that the institutional setup of the IMS has been in constant flux. It has been driven both by the dynamics of private profit-seeking financial institutions that push the limits of the credit money system in times of perceived financial stability, and by public authorities who have altered the systemic setup in reaction to crises (Braun 2015, Minsky 1986, Murau 2017a, 2017b, 2018). To use the old adage, there are known knowns, known unknowns, unknown knowns and unknown unknowns. In that vein, this paper embarks on the adventure of developing scenarios about the future of the IMS. We paint different versions of a picture that sketches what the IMS might look in decades time by 2040.

What is the value of such a scenario building exercise? In this paper, our goal is not to predict the future; without a crystal ball this would be a futile exercise. Nor is it our intention to develop policy proposals or institutional blueprints that would promise to improve the IMS; without a suitable methodology to spot the systemic risks inherent in the contemporary or possible future setups of the IMS, it is not possible to perform a sound analysis. Furthermore, we do not want to make a statement about the likelihood of any of the scenarios that we construct. As far as the transformations of a system are concerned, we are facing true uncertainty that does not allow us to compute probabilities (Knight 1921).

Instead, we develop scenarios to unveil the 'possibility space' for the future setup of the IMS. Scenario building is a tool for social learning and reframing perceptions (Derbyshire 2017). Scenarios are feasible, internally consistent descriptions of a specific aspect of the future that help us imagine new states which could emerge after major shocks, by considering the outcome of changing several variables at the same time, and not holding other variables constant (Neumann and Overland 2004). This allows us to move beyond binary choices, such as more or less regulation, or more or less globalization, and identify bifurcation points in a complex system which result from interactions in key variables. We employ subjective interpretation in conjunction with objective analysis to suggest how patterns might lead to those new states, and how they could look. In this vein, scenario planning challenges the mindset of traditional predictive analysis as it allows to identify salient trends within seemingly unlimited amounts of information. We can then conceptualize what the unknown unknowns might look like (Schoemaker 1995).

The future of the IMS has been discussed at various times in the past century, e.g. in the lead up to the Bretton Woods conference in the 1940s (cf. Keynes 1944, Schacht 1949) and around the collapse of the Bretton Woods System in the 1970s (cf. Cohen 1977, Cooper 1975, Machlup 1968, Mundell 1972, Triffin 1960). In the post-2008 crisis era, a new debate has emerged (cf. Eichengreen 2009, Eichengreen, Mehl and Chițu 2018, Farhi, Gourinchas and Rey 2011, Jaeger et al. 2013, Ocampo 2017, Prasad 2016, Uzan 2005 and Zhou 2009). Scholarship on the IMS's future now typically focuses on the role of reserve currencies, in particular whether the US-Dollar (USD) is likely to remain the key international currency, and whether that is desirable. The IMS is usually viewed as encompassing the particular setup of fixed or flexible exchange rates between monetary jurisdictions, the degree of international capital mobility as well as the extent to which autonomous national monetary policy is possible (see e.g. Eichengreen 2008). Such thinking is in line with the 'Impossible Trinity', which holds that a country can only have two of the three following features: open capital flows, a fixed exchange rate, and independent monetary policy (Broz and Frieden 2001).

We argue that these works typically have two features that are analytical shortcomings as they miss out on essential characteristics of today's era of financial globalization: Firstly, they are biased towards discussing the role of the state in the IMS while neglecting private money creation. Secondly, they focus on money forms that are issued onshore within a given monetary jurisdiction, while neglecting the stunning significance of offshore credit money creation.

In view of these shortcomings in the existing literature, our analysis of today's IMS is conceptually rooted in the framework of the 'Money View', an institutionalist market-based credit theory of money that addresses the role of private money and offshore money creation head-on (Mehrling 2011, 2015a; Pozsar 2014; Murau 2017b, 2018). On the one hand, the Money View conceptualizes that credit money can be created autonomously by various public and private institutions. To create credit money, the issuing institution expands its balance sheet and issues new debt certificates ("IOUs") that are considered money by other persons or institutions. The most straightforward examples of this are when a central bank expands its balance sheet to issue currency or central bank deposits, or when commercial banks extend loans and create commercial bank deposits. However, money creation is not limited to commercial banks and central banks. A range of IOUs function as 'near monies', sometimes called 'shadow money', that co-exist with more established forms of money and are issued by non-bank financial institutions, or 'shadow banks' (see Info Box #1).

On the other hand, the Money View transcends the common perception that money is only created within a state's boundaries. Empirically, a large amount of money is created offshore, outside the legal space of major monetary jurisdictions and their regulatory environment (cf. Denbee et al. 2016). How is that possible? From the perspective of a credit theory of money (Schumpeter 1954: 686; Mitchell-Innes 1914), the key prerequisite for creating credit money is a unit of account in which to denominate debts. The main units of account we have today are all connected to state structures, such as the USD, the renminbi, the British pound, or even the euro. Credit money creation then means issuing short-term IOUs, expanding the balance sheet of the issuing central, commercial or shadow bank. From a legal standpoint, this can occur either onshore or offshore—within the jurisdiction of the unit of account or outside of it (Advijev et al. 2015).

Hence, what distinguishes this paper from other works on the future of the IMS is its unique depiction of the IMS's contemporary institutional shape, which emphasizes the outstanding role of offshore credit money creation in USD through Eurodollar deposits, central bank swaps and 'shadow money' forms issued by non-banks such as overnight repurchase agreements (repos), money market fund (MMF) shares and foreign exchange (FX) swaps (Murau 2018). The scenarios we develop then refer to possible alternative trajectories which emanate from the institutional reality today. They carve out how onshore and offshore credit money creation might be organized by 2040, depending on how various political and economic factors and dynamics play out in the decades to come.

Info Box #1: Shadow Money

Shadow money as a concept comes from the idea that shadow banks, the opaque financial structures that lay at the heart of the 2007-9 financial crisis, are connected to new ways of creating money (Gabor and Vestergaard 2016, Murau 2017a). According to the definition of the Financial Stability Board, shadow banking is “credit intermediation involving entities and activities outside the regular banking system” (FSB 2011: 1). Some scholars theorize that a number of shadow bank liabilities are more than just financial assets, but rather money substitutes, or more precisely substitutes for commercial bank deposits. The rationale is as follows: if banks create deposits as money and if shadow banking is the contemporary version of banking in an unregulated realm, then shadow banks must be creators of something that is money in a functional sense. Theories of shadow money are closely connected to credit theories of money (Schumpeter 1954: 686) and ‘endogenous money’ approaches, which hold that money is not necessarily created and controlled by the state but emerges autonomously in the financial system during the process of credit creation (Werner 2016), beyond the full control of the state.

The three forms of shadow money that were connected to the 2007-9 financial crisis are money market fund (MMF) shares, overnight repurchase agreements (repos) and asset-backed commercial papers (ABCPs) (Ricks 2011, Mehrling 2011). These are high-quality, short-term debt instruments created by different non-bank financial institutions which function as shadow banks. MMF shares are the liabilities of MMFs, which pool the funds of households and institutional investors in the retail money market to invest them in the shadow banking system. Overnight repos are private debt instruments constructed around the sale and repurchase of securities. The repo market is run by securities dealers who—as they are willing to buy and sell repos at different prices and maturities—act as market makers. ABCPs are the liabilities of special purpose vehicles (SPVs)—entities set up by commercial banks, which use them as off-balance-sheet institutions to circumvent capital requirements.

These shadow money forms, despite being treated differently by regulators, are similar to bank deposits in three crucial respects (Murau 2017a). First, from a supply side perspective, both deposits and shadow money are short-term debt instruments issued on the balance sheets of financial institutions. The balance sheet mechanics involved have structural parallels, as the issuance of both deposits and shadow money involve swapping debt certificates of different maturities (Mehrling 2015a). This balance sheet operation lies at the heart of credit money creation (cf. Minsky 1986). Second, from a demand side perspective, deposits and shadow money are held by agents who consider them ‘cash’, i.e. the most liquid form of an asset capable of doing immediate purchases of commodities or financial assets (Pozsar 2014). Third, bank deposits and shadow money are promises to pay higher ranking money to which they effectively have a one-to-one conversion rate, i.e. they trade at par, and in which they are (almost) instantly convertible. In today’s financial system, these hierarchically higher forms of money are central bank liabilities for deposits, and deposits for shadow money.

A further instrument which has remained largely unaffected in the crisis but may potentially correspond to the shadow money criteria, are Foreign Exchange (FX) swaps. FX swaps can be perceived as repos using a foreign currency as collateral (Pozsar 2017) and involve credit creation. However, due to given accounting rules this is not recorded on-balance-sheet (Borio et al. 2017). FX swaps arguably play a key role in the ‘offshore dollar realm’ of today’s IMS (cf. Murau 2018).

Credit money forms denominated in all major currencies are created both onshore and offshore (cf. Denbee et al. 2016: 6). However, given that the US are the monetary jurisdiction at the top of the international hierarchy of money, the key feature of today’s IMS is that USD can be and is being created offshore. Hence, the dynamic core of the IMS for the provision of credit money on an international scale is what we call the ‘offshore dollar realm’. It is a largely unregulated space in which commercial banks, shadow banks and central banks create USD-denominated credit money outside of the US and supply it to the world market (cf. Table 1, derived from Murau 2018).

In its early stage, the offshore dollar realm was comprised of only private credit money forms. Its traditional core is the Eurodollar market (Awrey 2017), which would better be termed ‘market for offshore dollar deposits’. The market emerged in the 1950s in London’s financial district, ‘the City’, in the attempt to revamp London as a center of the global financial system and to supply USD deposits to communist countries who needed them for international trade but were not willing or able to receive them from the US directly. In the 1960s, New York banks discovered the Eurodollar market as a means to circumvent the strict domestic banking regulations established at the end of the Great Depression. The Eurodollar market, no longer limited only to London but extended to many other financial centers, became a complementary market to the domestic US money market (He and McCauley 2012). In the 1970s, with the rise of what today we call shadow banking system, new forms of private credit money emerged as substitutes for commercial bank deposits (Pozsar et al. 2012, Pozsar 2014). With its global interconnectedness, shadow banking does not adhere to state boundaries in monetary affairs. Shadow money falls outside the logic of the Westphalian monetary system and may occur onshore or offshore (cf. Lysandrou and Nesvetailova 2015). Today, the key forms of shadow money in the offshore dollar realm are MMF shares and FX swaps (Murau 2018).

In the 2007-9 Financial Crisis, a global bank run emerged during which holders of USD-denominated shadow money forms and offshore deposits tried to shift their credit money balances onshore under the protection of the Federal Reserve and the US deposit insurance. To tame the run, authorities intervened in a number of ways. One of them was to establish emergency swap lines with non-US central banks in whose jurisdictions offshore dollar creation took place. Effectively, the Fed put those central banks in the position to autonomously create USD-denominated public credit money on their balance sheets and lend them on to domestic banks engaged in offshore dollar creation. Some of these temporary swap lines were made permanent after the crisis (Mehrling 2015b). Therefore, the offshore dollar realm today is a hybrid of private and public credit money forms that mirror the domestic US monetary system.

Onshore USD Realm	Offshore USD Realm
<i>USD-denominated credit money issued in the US</i>	<i>USD-denominated credit money issued outside of the US</i>
Federal Reserve IOUs <ul style="list-style-type: none"> ▪ Fed deposits ▪ Fed currency 	Non-US central bank IOUs <ul style="list-style-type: none"> ▪ CB deposits via Fed’s swap lines
US commercial bank IOUs <ul style="list-style-type: none"> ▪ US wholesale deposits ▪ US retail deposits 	Non-US commercial bank IOUs <ul style="list-style-type: none"> ▪ Eurodollar deposits
US shadow bank IOUs <ul style="list-style-type: none"> ▪ (Overnight) repos ▪ MMF shares 	Non-US shadow bank IOUs <ul style="list-style-type: none"> ▪ USD FX swaps ▪ Offshore MMF shares

Table 1—The offshore dollar realm in today’s International Monetary System

The emergence of credit money creation in the offshore dollar realm represents a quintessential case for a functionalist theory of the monetary system’s transformation (cf. Murau 2018). The monetary system can be theorized as a self-referential network of expanding yet unstable debt claims (Murau 2017a, b). The expansion of the network leads to the ‘usurpation’ of ever new regulatory spaces, in which profit-oriented private financial institutions can bring forth novel forms of private credit money in phases of financial upswings. Public authorities only adopt a leading role in a crisis when the expansion is about to revert itself. With our scenarios, we discuss different possible versions for how the expansion of the credit money system could continue. We use our conception of the contemporary IMS as starting point and extrapolate forward along several potential trajectories into the future.

We argue that two major factors are particularly influential for the trajectory of the IMS’s evolution: The first criterion refers to whether an international financial crisis will occur which induces a change of the system (in contrast to minor crises that are only accompanied by changes within the system), and the second whether large-scale international political cooperation will prevail in international monetary affairs or not. In the absence of a crisis-induced major change of the system and with no substantial challenge to the power distribution, we see the emergence of the evolutionary-cooperative scenario of Continued Dollar Hegemony. If competition to US hegemony emerges, it might induce the evolutionary-competitive scenario of Competing Monetary Blocs. In contrast, scenarios III and IV detail setups of the IMS which could emerge out of a cataclysmic, crisis-induced systemic transformation. If political momentum emerges and the IMS is put on a coherent foundation, we might obtain the revolutionary-cooperative scenario of an International Monetary Federation. If cooperation should fail, we could end up with the revolutionary-competitive scenario of International Monetary Anarchy (cf. Figure 1).

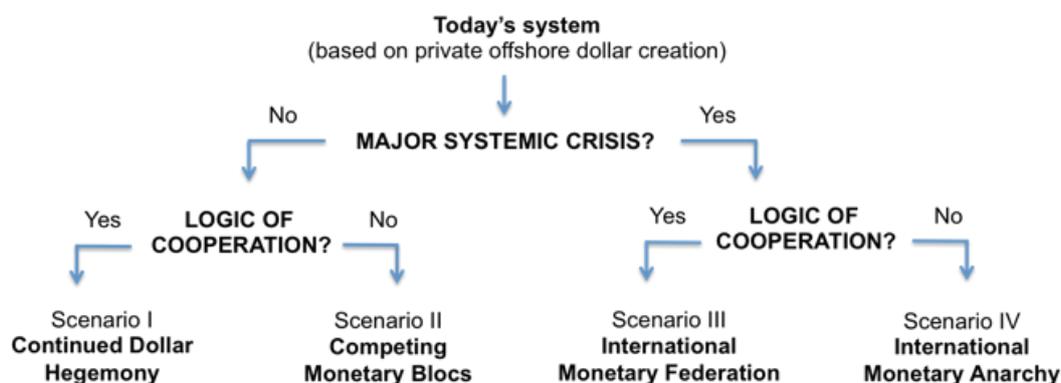


Figure 1—Bifurcation diagram leading to the four scenarios for the IMS by 2040

Why do we attribute such paramount importance on the emergence of a systemic crisis for a major change of the IMS to happen? Today’s credit money system can be thought of in its essence as a large Ponzi scheme, primarily pushed forward by private profit-oriented initiative and sustained by various public and private institutions which had developed over centuries. We argue that the most important factor for systemic change of the IMS—and here we ignore apocalyptic exogenous shocks such as the outbreak of a nuclear war or a cometary impact—is that this Ponzi scheme implodes endogenously. How would such a crisis unfold? On a sufficiently high level of abstraction, we can make some statements on this by extrapolating from historical experience and the dynamics of previous major crises (cf. Murau 2017b). We assume that the crisis would start with the default of issuers of private credit money who did not have access to explicit public liquidity and solvency backstops and had not been subject to tight public regulation and supervision. In today’s setup of the IMS, this could be in the offshore shadow money system, in monetary jurisdictions outside the umbrella of the C6 swap lines. The contagion would spread upwards in the hierarchy towards the center where it ultimately tests the IMS’s last resort: whether the Fed’s C6 swap lines hold or not. The cataclysmic crisis marks a situation in which they fail and we have to ask: what comes next?

Before proceeding to lay out the scenarios, we would like to acknowledge several choices we made in pursuing our analysis.

First, the scenarios lean heavily on the conceptual account of how credit money is created by both public and private institutions as outlined in the Money View as well as its associated theoretical apparatus and terminology. This implies the notion that the contemporary IMS relies predominantly on private financial institutions that use public units of account to create credit money both onshore and offshore. The scenarios are structured around the key categories of the Money View: the shape of the international and domestic structure of the monetary hierarchy, the hybridity of public and private actors with regard to money creation and the expansion of the monetary system, as well as the manifestation of the onshore-offshore dualism. Altogether, they sketch possible setups of the international political economy by 2040, while connecting them both to political-economic theories of system stability and precedents in economic history.

Second, we have opted for four scenarios as a compromise between displaying a diversity of possible futures and at the same time keeping it succinct and comprehensible. To enhance the plausibility of our scenarios, we connect them to eras in economic history when the IMS had a comparable shape. However, the possibility space we sketch is by no means exhaustive. The four scenarios are only potential setups of the IMS that could emerge out of the two bifurcation points we have suggested to look at. We acknowledge that different bifurcation points could be chosen which could produce different setups of the IMS. Therefore, it is true that we could envision many more varieties of hegemonic monetary situations in the ‘evolutionary’ trajectory, e.g. with different degrees of private and public credit money creation, or develop an even greater number of fundamentally different institutional setups of the IMS in the ‘revolutionary’ trajectory, e.g. where a decentralized block chain currency emerges to provide global money.

This leads us, third, to the role of cryptocurrencies and how blockchain technologies might influence the monetary system. Blockchain technologies and cryptocurrencies offer what some see as a substantial alternative to the established credit money system. From a Money View perspective, cryptocurrencies are forms of ‘non-credit’ or ‘token’ money that have explicitly been developed to ‘overcome’ the credit character of money, which is perceived as a bug of the current system and not as a productive feature (Mehrling 2017). For our scenarios, we acknowledge a rising relevance and public attention to blockchain and cryptocurrency but do not base fundamental changes in the IMS upon it. In particular, we assume that a breakthrough of cryptocurrency in which it would attain systemic relevance on an international scale can only materialize if, as in our Scenario IV, the ‘financial plumbing’ of the established credit money system is destroyed by a major financial crisis and has not been restored by political action. Otherwise, we argue that the central bank backed credit money system would prove too strong for blockchain technologies to dislodge the system (see Info Box #2).

The remainder of this paper is organized as follows. Section 2 on Continued Dollar Hegemony sees sustained dominance of private international money creation via offshore dollars within the Pax Americana. Section 3 on Competing Monetary Blocs envisions the US, the EU and China as three gravitational centers with private international money creation in the blocs’ peripheries via offshore dollars, euros and renminbi, respectively. Section 4 on the International Monetary Federation outlines the creation of a publicly organized IMS, comprising a multilateral framework of one international and several regional clearing unions in which private money creation is scaled back to the national level. Section 5 on International Monetary Anarchy sees the emergence of a true non-system with a substantial breakdown of public and private international monetary cooperation and creation. Section 6 concludes by highlighting how the scenarios have sketched the possibility space for the future of the contemporary IMS based on offshore dollar creation.

Info Box #2: Blockchain and Cryptocurrencies

At the most basic level, blockchain technologies are electronic databases where new activity is added to a chain or list, and encoded to ensure validity. Blockchain does not require a central hub, and utilizes a decentralized network of computers to maintain and update the database. It is part of the larger family of distributed ledgers technologies, which are shared databases of data spread across multiple computers. Cryptocurrencies, such as Bitcoin, are a type of digital asset which uses mathematical calculations and encryption techniques to move funds, verify transactions and create new currency. To date, cryptocurrencies exist outside of government control and do not require banks to create money or make payments (Drescher 2017). The impact of cryptocurrencies and blockchain on the future of the IMS is uncertain and also depends on the reaction of governments, regulators, and financial players to the technology. Proponents point to several features that they argue are better than the current system: cryptocurrencies are not credit money, owners of cryptocurrency can always access their funds and verify they are not being lent elsewhere at the same time, government institutions and central banks are not needed to support and regulate the system, and near instantaneous transactions can be executed without involving banks. Crypto enthusiasts argue that this will reduce costs for consumers, stop central banks and governments from propping up the bloated financial sector, and prevent price inflation.

Without a central bank to manage public expectations about the money supply and price stability, it is not clear that the price of cryptocurrencies will ever stabilize, making them very difficult to use for payments, savings and investment. One of the hallmarks of modern central banking is fostering the public's belief in price stability. Cryptocurrencies crucially lack this feature. The lack of central bank backstopping has further implications for cryptocurrency financial intermediaries. From a Money View perspective, modern banking is the swap of IOUs. Banks are able to extend credit without having first gathered the funds, due to their privileged relationship with central banks and regulators. If liquidity issues emerge, banks can access funds via the interbank market or at the central bank, and depositors are ultimately protected by deposit insurance. Both of these features prevent depositor bank runs from occurring. This also gives the modern banking system the flexibility and liquidity to extend credit quickly and easily, supporting investment, employment and consumer demand (Mehrling 2017). Thus, government and central bank support for the credit-money banking model gives it a huge advantage over upstart cryptocurrency lending models (Hockett and Omarova 2017). Other challenges include highly volatile prices, costly and energy intensive 'mining' of new cryptocurrency, the need to convert cryptocurrencies back into the national currency to make most expenditures, and the constantly changing regulatory environment. In addition, there is need for exponentially increasing storage capacity to maintain the blockchain records, which includes considerable energy and resource usage.

Besides cryptocurrencies, many other blockchain applications are emerging which may have significant impact on economic activity and financial stability. Several central banks have looked at the viability of using blockchain to issue central bank cryptocurrencies or facilitate interbank payment networks. Private actors develop applications to perform secure payments, insurance, information sharing, voting, peer-to-peer lending, and securing property rights. Blockchain technologies will likely adopt a substantial role in financial activity in coming years, but will probably not spell the end of the current credit-money based financial system.

2. Continued Dollar Hegemony (Scenario I)

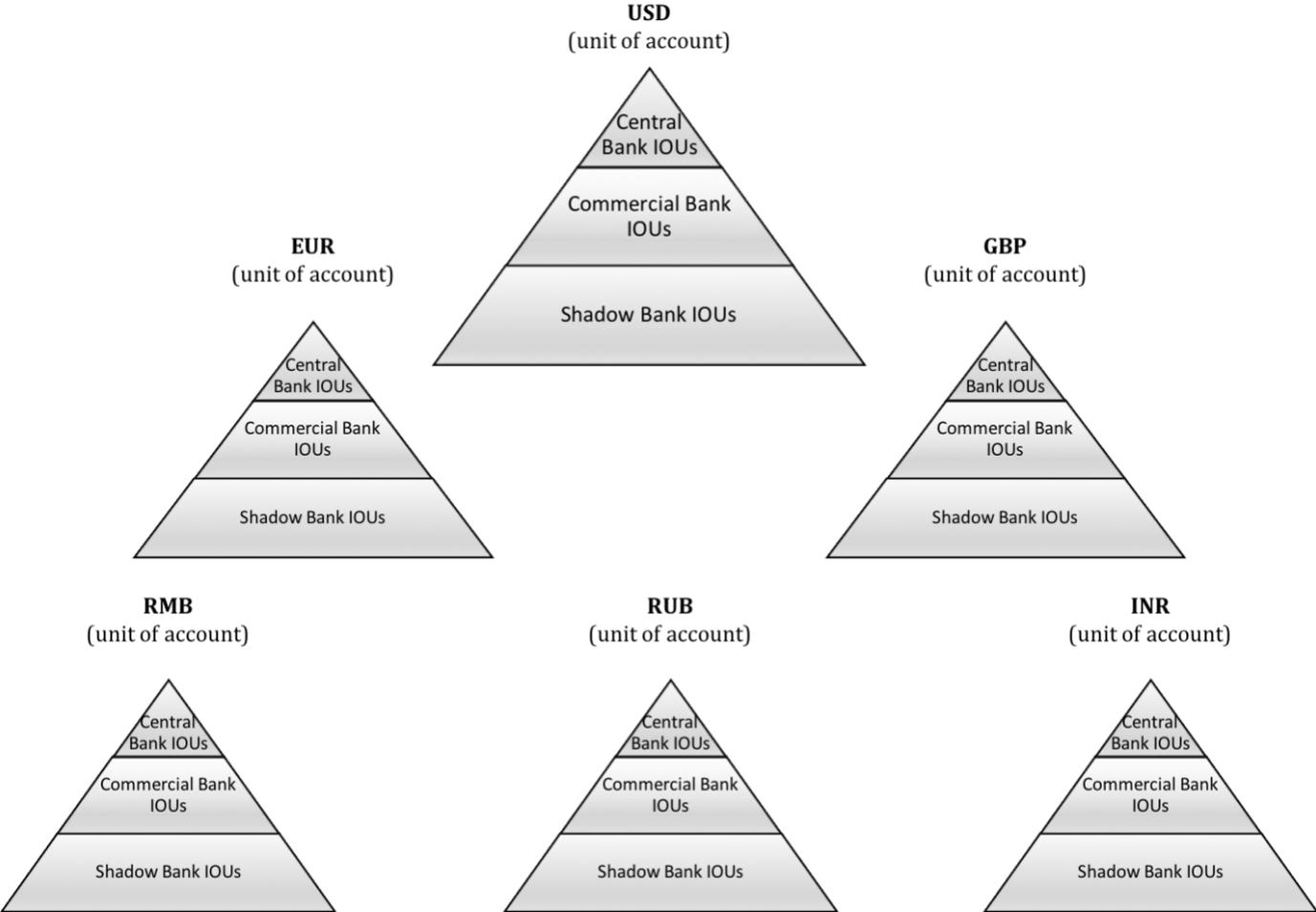
In the scenario of Continued Dollar Hegemony, the future setup of the IMS most closely resembles the shape of today's IMS. No major system-changing international financial crisis has occurred by 2040 and the US's lead in international monetary affairs has not been fundamentally challenged by other states or regions. The expansion of the monetary system as a self-referential network of expanding yet unstable debt claims has continued relatively unhampered. In line with Charles Kindleberger's 'Hegemonic Stability Theory' (cf. Kindleberger 1973), the US monetary hegemony has proven to be the most stable arrangement. Historical precedents for such a hegemonic setup can be found, for example, in the IMS's structure during the Classical Gold Standard, roughly from 1880 to 1914, when the British Empire was the world's monetary hegemon as well as in the contemporary IMS, in which the US are the world's unchallenged monetary hegemon, at least since the collapse of the Soviet Union.

2.1 International Monetary Hierarchy

With the persistence of US monetary dominance, the US has retained its unchallenged position at the top of the international monetary hierarchy. The post-Bretton Woods international financial order that developed in the 1970s has remained largely in place, with the Fed at the helm, backing up global use of the USD in credit money creation, investment and trade. Shaken by the political volatility caused by the challenging Eurozone situation, the weariness brought on by Brexit, and social upheaval in the Southern EU member states, the EU has not challenged the US's position. The European Monetary Union (EMU) still exists, but no substantial progress has been made to overcome its structural problems, not least due to prevailing political gridlock. Competing political powers and ideologies within Europe continue to render the EU unable to make the necessary changes. Pressing political-economic issues are met with ad hoc solutions and 'muddling through'. The inability of the euro (EUR) to be an attractive key international unit of account reinforces USD dominance. Other potential powers such as China, Russia or India fail to attain the political force to seriously challenge the USD system. China would have the critical economic mass to render it a monetary hegemon, but without international trust in the transparency of the Chinese government, deep and liquid financial markets, interest rates responsive to market conditions and capital account liberalization, it is unable to rival US financial clout (Yu 2014). The network externality of the USD system—delivering the unique world currency underpinned by the Fed and its relationship with other central banks through the C6 swap lines—is too strong and the costs associated with a change to the system are too high for other monetary jurisdictions to provide serious alternatives to the USD-based international order.

Figure 2 depicts the structural arrangement of this scenario, whereby the US sits on top of all other monetary jurisdictions as it provides and administers the USD as the internationally dominant unit of account (cf. Murau 2018). Various forms of public and private credit money denominated in USD form the hierarchy of money within the US's monetary jurisdiction, with the Fed—issuing USD notes and central bank deposits—functioning as the global backstop of the system, both nationally and internationally. All other monetary jurisdictions are located on the hierarchically lower levels and form a multi-layered periphery to the unipolar center in the IMS's apex. As examples for the layers below the apex, we have depicted the EMU, in which credit money is issued denominated in EUR, and the United Kingdom (UK), in which credit money is issued in British Pound (GBP). These monetary jurisdictions are closer to the center than other monetary jurisdictions such as China using renminbi (RMB), Russia using rubles (RUB) or India using rupees (INR) as their units of account. A key criterion for the layer on which a monetary jurisdiction is located is if it is part of the network of unlimited swap lines with the Fed. Therefore, Canada, Japan and Switzerland can be thought of as being part of the second layer. Further layers can be added to the hierarchy.

Figure 2—Scenario I: Continued Dollar Hegemony (evolutionary-cooperative)



2.2 Public-private Hybridity

In the Continued Dollar Hegemony scenario, the monetary system as a self-referential network of expanding yet unstable debt claims has disseminated further, while largely retaining the dynamics prevalent in the IMS's postwar transformation (cf. Murau 2018). Hence, the system's expansion has remained in a path-dependent trajectory and has followed a co-evolutionary process which has boosted financial globalization to ever higher levels. Private financial institutions have driven the expansion of credit money creation with their financial innovations. Regulators and central banks, in turn, have attempted to 'tame' the system by reacting to the latest financial developments, but their regulations always lag behind. Therefore, by far the largest share of credit money created in the IMS continues to be issued by private institutions outside the umbrella of public regulation and supervision. In the monetary system's hybrid structure, the private component is clearly dominating.

US domestic public institutions, first and foremost the Fed and the Treasury, hold the key political decision-making powers for all matters relevant to the IMS. Besides the Fed, other central banks have considerably less influence on the IMS. Only the Fed has full discretion in its activities due to its position at the top of the hierarchical system. We may think of this scenario as an enduring Pax Americana. The US is the key organizing force, but also the main beneficiary measured in terms of relative distribution of power and wealth. As the US remains largely unchallenged in international political and monetary matters, it has retained its 'exorbitant privilege'. The peripheral monetary jurisdictions are geared to the policies and regulations in the center, i.e. the US. Institutionally, they have therefore become more similar to each other and more integrated. As in today's system, flexible exchange rates are in place between the center and the major peripheral monetary jurisdictions, while the central banks of smaller peripheral monetary jurisdictions tend to choose exchange rate pegs with major ones.

The structure of international monetary governance also reflects the privately-driven evolutionary logic of the monetary system in combination with the Pax Americana. The control of the main international institutions remains in US hands. Under US stewardship, the G7/G8 format is still most effective for implementing international monetary governance decisions; the G20 plays a weaker role, without significant ability to regulate international monetary matters. The policies of the main international monetary institutions are shaped by liberal market-based approaches in the style of the Washington Consensus. The International Monetary Fund (IMF) has not adopted a substantial independent role, also because the US keeps its veto power. The Bank for International Settlements (BIS) continues to provide a safe space for central bankers to exchange their views in private but has no executive power. New noteworthy international monetary institutions have not been created.

2.3 Onshore-Offshore Dualism

As part of the Continued Dollar Hegemony, the dominance of USD-denominated private credit money issued offshore has further intensified. While offshore markets for other major units of account continue to exist, such as EUR, RMB or JPY offshore markets, their volumes and systemic relevance are much smaller than the USD markets. The 'offshore dollar realm' remains the key source for the creation of credit money for international purposes. The largest part of the money supply consists of private credit money forms created by banks and shadow banks.

Table 2 depicts in detail how the onshore-offshore dualism in USD creation has developed in this scenario with regard to the various credit money forms employed. It is an adaptation of Table 1, which highlights the contemporary state of onshore and offshore USD instruments. To demonstrate changes in the relative importance of instruments, we use the following font scheme: instruments in bold have increased in volume and importance, instruments in regular font have broadly retained it, and instruments in italics have decreased.

Onshore USD Realm	Offshore USD Realm
<i>USD-denominated credit money issued in the US</i>	<i>USD-denominated credit money issued outside of the US</i>
Federal Reserve IOUs <ul style="list-style-type: none"> ▪ Fed deposits ▪ <i>Fed currency</i> 	Non-US central bank IOUs <ul style="list-style-type: none"> ▪ CB deposits via Fed's swap lines
US commercial bank IOUs <ul style="list-style-type: none"> ▪ <i>US wholesale deposits</i> ▪ US retail deposits 	Non-US commercial bank IOUs <ul style="list-style-type: none"> ▪ Eurodollar deposits
US shadow bank IOUs <ul style="list-style-type: none"> ▪ MMF shares ▪ Overnight repos ▪ New onshore private money form 	Non-US shadow bank IOUs <ul style="list-style-type: none"> ▪ Offshore MMF shares ▪ USD FX swaps ▪ New offshore private money form

Table 2—Evolution of the USD's onshore-offshore dualism

On the level of central bank money, the Fed continues to issue bank notes. Despite contrary predictions (Rogoff 2016), the age of cash is not over but its use has decreased. Federal Reserve deposits continue to be used to backstop and manage the activity of the onshore banking system. The network of permanent unlimited swap lines remains in place with the Fed as the global center of the Global Financial Safety Net. Through them, the Fed enables central banks of allied countries to create USD-denominated central bank deposits at their discretion and lend them to banks in their monetary jurisdiction that are involved in offshore USD creation.

Among commercial bank IOUs, the Eurodollar market has kept its outstanding role as the heart of the offshore dollar realm. Under the system of US stewardship, offshore USD deposits have a backstop in the form of the Fed's C6 swap lines that is perceived as credible by market participants and policy-makers alike. The expansion of the swap lines fuels the system's growth and international interconnectedness, while the implicit power of the US underpins the system. Some inconsistency remains, however. For example, London Eurodollars are backstopped by the C6 swap lines, while Hong Kong Eurodollars are not. The Fed Funds market, by contrast—as the Eurodollar market's onshore counterpart for creating wholesale commercial bank money—has decreased in relevance.

With the unhampered expansion of the credit money system, the volume of shadow money has increased, although there are no explicit public backstops. MMF shares and overnight repos remain important, somewhat regulated instruments. Due to their entanglement in the 2007-9 Crisis, they are tightly supervised by US authorities. The pivotal shadow money form are FX swaps, the offshore version of repos. They still are an opaque instrument that according to international accounting standards is not transparently represented on-balance-sheet (cf. Borio et al. 2017). For this reason, and because they had remained largely unaffected in the 2007-9 Crisis (Stenfors 2017), public regulation and supervision of FX swaps remains very low. They prove attractive for risk-seeking investors or financial market participants who do not have access to the market for onshore or offshore USD deposits. In addition, new forms of onshore and offshore shadow money have emerged out of private financial innovation. They remain largely off the radar of public authorities.

In sum, the scenario of Continued Dollar Hegemony sketches a future in which the IMS is further centered around a globalized system of offshore USD creation by private banks and shadow banks. The units of account provided by other monetary jurisdictions play a subordinate role and cannot compete with the USD's network externality. Alternative forms of money such as cryptocurrencies remain marginalized, playing no major role other than serving as a volatile asset for speculators. The structure of the IMS overall reinforces the US's global political-economic dominance.

3. Competing Monetary Blocs (Scenario II)

In the scenario Competing Monetary Blocs, a rearrangement of the IMS's setup has taken place by 2040, with the emergence of several monetary blocs. Like Scenario I, the IMS has avoided a substantial international financial crisis. However, in this scenario an endogenous process of institutional transformation has scaled back the IMS's unipolar hegemonic structure. The US's lead in international monetary affairs has been eroded by the rise of the EU and China as competing hegemonies who have gained ground on the US in terms of economic power and the global desirability for their unit of account. As a result, a multi-polar structure of the IMS has developed, with three gravitational centers and three competing global units of account: the USD, the EUR and the RMB. Historical examples of a multipolar IMS include the time before the establishment of the gold standard in the mid-19th century, arguably the 1930s and 40s, as well as the Cold War period.

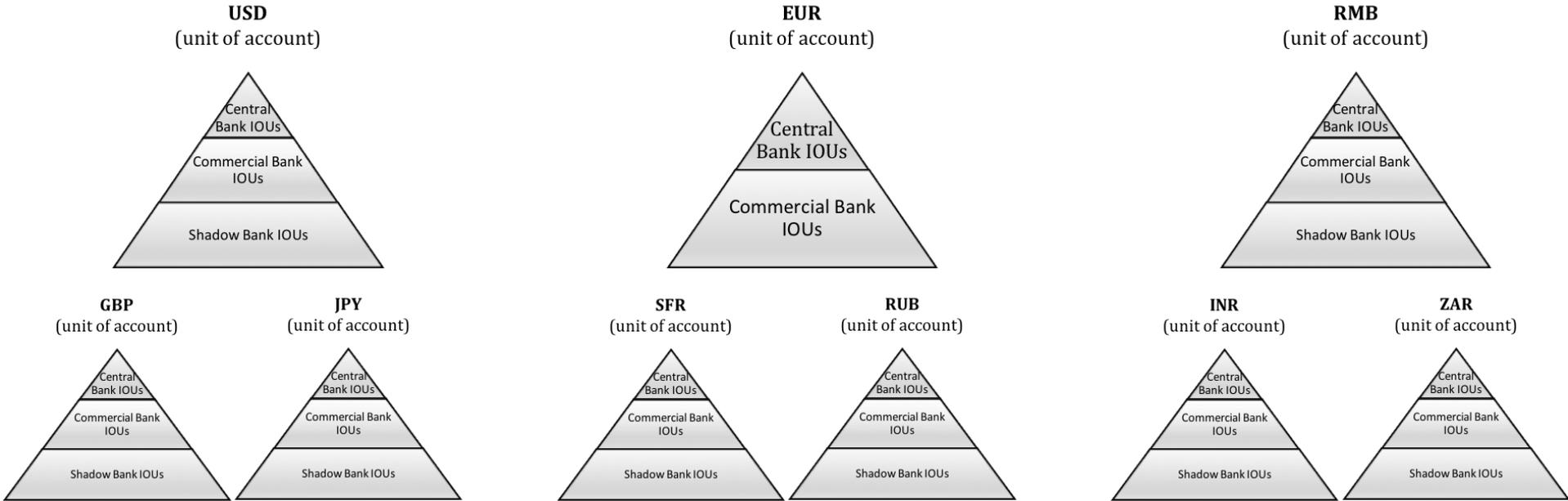
3.1 International Monetary Hierarchy

In this scenario, the shape of the international monetary hierarchy has changed over time. The US's role of uncontested monetary leadership has gradually diminished. Due to a shift in political preferences and the relative power of interest groups, the US redirected its attention from global governance to inward management and withdrew from numerous multilateral agreements. New legislation restricted the Fed's ability to act as the IMS's global backstop. Further discretionary balance sheet expansions in cases of a crisis have been ruled out, the network of permanent unlimited central bank swap lines has been scaled back, and the Fed's leeway in monetary policy has been restricted by Congress through the introduction of a legally binding Taylor rule. The US's competitors, by contrast, have been strengthened. The EU has reformed its governance structure and established effective political decision-making mechanisms. It found a monetary architecture that has overcome the design flaws of the initial Maastricht regime and has proven to be so attractive that all remaining member states introduced the EUR. After a reorientation of UK economic activity towards the US after Brexit, the EU's financial sector has been massively re-regulated upon German-French initiative, which has substantially reduced the ability for shadow money creation. Market access for UK and US financial firms has been made more difficult, whilst cooperation with Eastern Europe increased. This resulted in a gradual financial disintegration of the EU and the US bloc. China, in turn, has developed into the uncontested Asian monetary hegemon, with most Asian countries (besides its long-term political rivals Japan and South Korea) under its monetary umbrella. China has continued to expand its investment in Africa and has made steps towards incorporating the continent into its own economic periphery, using RMB as the unit of account for trade and investment activities.

Figure 3 sketches the multipolar setup of the IMS that has thus emerged. Instead of one single unifying hierarchy, three hierarchical structures have come to co-exist next to each other. The three key monetary jurisdictions form the respective centers around which a multilayered periphery has been established. The figure depicts—again in an incomplete way and merely indicating some selected monetary jurisdictions as examples—the newly emerged periphery to the US bloc with the UK and Japan, to the EU bloc with Switzerland and Russia, as well as to the Chinese bloc with India and South Africa issuing its rand (ZAR).

From a theoretical point of view, this scenario is informed by the literature critical of the Hegemonic Stability Theory. The IMS being stable without a single country acting as a monetary hegemon is an argument that has been made, for example, by Eichengreen (2014). In fact, there are various episodes in economic history when the world was divided up into competing monetary blocs. Flandreau (2004) depicts the IMS's setup before the Classical Gold Standard as a multipolar system with one gold bloc led by the British Empire, a silver bloc dominated by the US and Prussia, as well as a bimetallic bloc which was managed by France and mitigated between the two. This system only came to an end when France was defeated by the German states in 1871 as the newly founded German Reich demonetized

Figure 3—Scenario II: Competing Monetary Blocs (evolutionary-competitive)



silver and joined the gold bloc. Moreover, the IMS in the 1930s and 40s bears resemblance with a multipolar scenario when Nazi Germany had established an international monetary architecture alternative to the liberal one (cf. Keynes 1944). Finally, we may think of the IMS during the Cold War as multipolar, with the socialist bloc under the Soviet Union's hegemony competing with US-dominated Western bloc (cf. Ellman 2014).

3.2 Public-private hybridity

In the Competing Monetary Blocs scenario, in absence of a major systemic financial crisis, the monetary system as a self-referential network of expanding yet unstable debt claims has disseminated further. The era of financial globalization has not come to an end; credit money claims in various forms continue to be piled up on top of each other, with considerable international entanglement. However, the dynamics of the monetary system's expansion have played out differently in each of the three blocs. As a consequence, the hybridity of public and private credit money takes shape differently in each of the segments of the multipolar IMS.

In the US bloc, a liberal approach towards financial regulation prevails, which may be called the Washington-London consensus. Therefore, the co-evolutionary process of the monetary system's expansion, which we have witnessed throughout the second half of the 20th century (Murau 2018) continues. Protected by the political power of the Pax Americana, private profit-oriented financial institutions have further been able to conduct financial innovation and fuel the growth of the shadow money system. Public authorities routinely react with light-touch regulations without seriously impairing private activity. Under the conditions of international monetary competition and with a more inward-looking domestic political environment, financial liberalism is seen as comparative advantage, in particular purported by the Fed which uses it as a means of fighting against Congress for its independence. Thus, in the hybrid structure of the monetary system, the private side dominates while the public side has imposed self-restraint upon itself.

The EU Bloc follows a Berlin-Paris consensus which has implemented heavy financial regulation and has sharply restricted the privately driven expansion of the credit money system. The shadow banking system has been massively scaled back through strict EU regulations and the introduction of a financial transactions tax, which also applies to repos. Instead, the commercial banking sector is dominant in the sphere of private money creation, although banks face high equity ratios and have very limited room for maneuver with regard to financial innovation. The ECB has attained a powerful role within the EMU. Albeit bound by the European Treaties, it is now the backbone of managing the Eurozone 2.0 with far-ranging competences amidst the EU's complex decision-making structures. As a consequence of its restrictive regulations, the EU has ring-fenced its financial sector to protect it from the competition of more liberal financial systems. Its heavy internal regulations and high entry barriers have made it less connected to other blocs. Hence, in the EU's monetary hybridity, the private side is heavily restrained whilst public actors are much more dominant.

In the Chinese bloc, the Beijing consensus demonstrates a fusion of financial liberalism and mercantilism. The Chinese state-managerial system is characterized by a tightly regulated domestic banking system to publicly control domestic investment while at the same time supporting the continued growth of unregulated shadow banking and promoting the use of RMB internationally. The overarching goal of such policies has been to augment the bloc's power and wealth. The People's Bank of China is formally independent but strategically guided by the party. With the legacy of Chinese holdings of USD reserves and continued economic interaction between the two, the linkage between the US and Chinese economic and financial actors has increased and further fuelled the expansion of the credit money system. Private credit money creation has become more and more important within the bloc's hybridity, with the public side playing the role of an active facilitator.

Within the three blocs, the central banks of the peripheral countries have very little discretionary autonomy and orient their monetary policies towards the center countries; some have even chosen a firm peg. Between the blocs, flexible exchange rates are in place; the USD, the EUR, and the RMB are freely floating against each other. There is a considerable degree of monetary competition between the three central monetary jurisdictions as the respective decision-making bodies attempt to attract ever more trade and financial activity to their units of account. In order to compete with the liberal US system, the Europeans and the Chinese have adopted different strategies. In the EU bloc, policy makers sought to make their system attractive by providing a well-regulated safe haven environment with high equity ratios and a financial transactions tax on short-term financial transactions to incentivize long-term investments in the real economy. The Chinese, by contrast, have continued their strategy of continuously expanding the RMB's geographical sphere of influence, driven by their managerial state structures.

The monetary system's transformation dynamics and the multipolar setup of the international monetary hierarchy have affected the institutions of international monetary governance. Due to the divide between the US and EU blocs, the G7/G8 format is no longer in use. Instead, the G20 have become the key forum for international discussion, cooperation and conflict among the blocs' leading politicians and administrators. The BIS is a place of clash between the leading central bankers of the blocs. While no new strong and influential monetary organisations have been created on a global level, regionalization tendencies have been strengthened. The IMF has lost considerable influence and has developed into a regional fund specific to the US bloc. The US have formally maintained their veto power within the IMF, but the EU and China have gradually withdrawn and created their own structures. A European Monetary Fund (EMF) has been built upon the structures of the European Stability Mechanism (ESM), and the ASEAN-Chinese Monetary Fund (ACMF) has been set up in the framework of the ASEAN-China Free Trade Area. This further signifies the distribution of power towards the regional hegemons seen in this scenario.

3.3 Onshore-Offshore Dualism

Within the Competing Monetary Blocs structure of the IMS, offshore credit money creation still plays an important role in providing international liquidity. However, the offshore markets are less globally oriented and have become rather idiosyncratic to the three blocs. Due to the different political approaches towards the monetary system, offshore credit money creation plays a different role in each of the blocs.

In the US bloc, the offshore dollar realm remains a key source of liquidity; private offshore dollar creation has been continuously fueled by the US's and the UK's laissez-faire policies. The relative importance of the instruments has evolved in a similar way as in Scenario I (cf. Table 3a, where bold indicates an increase in volume and relevance, italics a decrease and regular font broadly continuation). Onshore deposits are still the main form of retail credit money, whilst their relevance as wholesale money has decreased. Instead, Eurodollar creation has expanded in line with overnight repos, FX swaps and new forms of shadow money at the expense of MMF shares. Those offshore private credit money forms are mainly issued in the US's peripheral countries, especially in the UK. Closer Anglo-American cooperation has tightened the connection of the New York and London money markets. Domestic private money creation by banks continues to be backstopped by central bank activity. Yet, the Fed has become more restricted in its ability to create public credit money in the form of central bank deposits and to act as a lender of last resort. Printed USD bank notes are less widely in use. The Fed's network of central bank swap lines is still in place with its closest allies within the bloc, especially the UK, Canada and Japan. The arrangement with the ECB is conditional rather than unlimited. Moreover, due to the domestic political opposition to this instrument, market participants are weary whether the Fed will have the power to stand by its commitment in a major crisis. Therefore, the Fed's swap lines are increasingly thought of as a fair weather construct.

Onshore USD Realm	Offshore USD Realm
<i>USD-denominated credit money issued in the US</i>	<i>USD-denominated credit money issued outside of the US</i>
Federal Reserve IOUs <ul style="list-style-type: none"> ▪ Fed deposits ▪ <i>Fed currency</i> 	Non-US central bank IOUs <ul style="list-style-type: none"> ▪ CB deposits via Fed's swap lines
US commercial bank IOUs <ul style="list-style-type: none"> ▪ <i>US wholesale deposits</i> ▪ US retail deposit 	Non-US commercial bank IOUs <ul style="list-style-type: none"> ▪ Eurodollar deposits
US shadow bank IOUs <ul style="list-style-type: none"> ▪ MMF Shares ▪ Overnight) repos ▪ New onshore private money form 	Non-US shadow bank IOUs <ul style="list-style-type: none"> ▪ Offshore MMF shares ▪ USD FX swaps ▪ New offshore private money form

Table 3a—Evolution of the USD's onshore-offshore dualism

In the EU bloc, the market for onshore shadow money forms has been largely dried out. Overnight repos, which used to be the key shadow money form in the EMU (Gabor 2015), have been demonetized due to the financial transactions tax and no longer function as a substitute for commercial bank deposits. The market for deposits, in contrast, has received a boost by the successful implementation of a banking union in the new Eurozone architecture. Traditional deposit banking has been revived both on the wholesale and the retail side. Onshore banks continue to be backstopped by the strengthened ECB. At the same time, offshore EUR markets have spread, facilitated by the peripheral monetary jurisdictions, for example Switzerland and Russia, for whom this represents a convenient source of income. The key instruments are offshore EUR deposits ('Euroeuros') and EUR-denominated FX swaps. The financially restrained EU at the bloc's core allows a certain extent of evasion from its heavily regulated mainland financial system. The rise of EUR-denominated private offshore credit money creation has been supported in particular by the ECB, which in an attempt to counteract the Berlin-Paris consensus has built up massive swap lines with the peripheral monetary jurisdictions of the EU bloc (cf. Table 3b).

Onshore EUR Realm	Offshore EUR Realm
<i>EUR-denominated credit money issued in the EU</i>	<i>EUR-denominated credit money issued outside of the EU</i>
ECB IOUs <ul style="list-style-type: none"> ▪ ECB deposits ▪ ECB currency 	Non-ECB central bank IOUs <ul style="list-style-type: none"> ▪ CB deposits via ECBs swap lines
EU bank IOUs <ul style="list-style-type: none"> ▪ EU wholesale deposits ▪ EU retail deposits 	Non-EU bank IOUs <ul style="list-style-type: none"> ▪ Offshore EUR deposits
	Non-EU shadow bank IOUs <ul style="list-style-type: none"> ▪ EUR FX swaps

Table 3b—Evolution of the EUR's onshore-offshore dualism

In the Chinese bloc, offshore RMB creation is seen as a means for further internationalization of the RMB and has been actively promoted by the authorities (cf. He and McCauley 2012). By 2040, the Chinese monetary jurisdiction has witnessed an increase of all forms of central bank money—central bank deposits and currency issued onshore on the PBoC’s balance sheet, as well as RMB-denominated central bank deposits issued on the balance sheets of central banks in monetary jurisdictions peripheral to the Chinese bloc. These peripheral central banks are part of the PBoC’s swap network, which it has developed in competition to the Fed’s swap network. The PBoC has continuously expanded it, for example through collaboration with the revamped Chiang Mai Initiative and African monetary jurisdictions. Due to the domestic restraints on commercial banks, the issuance of Chinese wholesale and retail deposits stalled onshore, even though they had still formed the undisputed core of Chinese finance at the end of the 20th century (Elliot and Yan 2013). Instead, the bloc’s peripheral states such as India and South Africa host large offshore RMB markets where the creation of offshore RMB deposits (‘Eurorenminbi’) flourishes. Moreover, the domestic regulation of commercial banking in combination with the PBoC’s swap network has contributed to the continuous growth of Chinese shadow banking (cf. Elliott, Kroeber and Qiao 2015). Therefore, various forms of RMB-denominated shadow money have emerged both within the bloc’s center and periphery (cf. Table 3c).

Onshore RMB Realm	Offshore RMB Realm
<i>RMB-denominated credit money issued in China</i>	<i>RMB-denominated credit money issued outside of China</i>
PBoC IOUs <ul style="list-style-type: none"> ▪ PBoC deposits ▪ PBoC currency 	Non-PCoB IOUs <ul style="list-style-type: none"> ▪ CB deposits via PBoC swap lines
Chinese commercial bank IOUs <ul style="list-style-type: none"> ▪ Chinese wholesale deposits ▪ Chinese retail deposits 	Non-Chinese commercial bank IOUs <ul style="list-style-type: none"> ▪ Offshore RMB deposits
US shadow bank IOUs <ul style="list-style-type: none"> ▪ Various onshore private credit money form 	Non-EU shadow bank IOUs <ul style="list-style-type: none"> ▪ New offshore private credit money form

Table 3c—Evolution of the RMB’s onshore-offshore dualism

In sum, the scenario of Competing Monetary Blocs sketches a future in which offshore credit money creation is still a dominating feature but has been shifted towards the peripheral monetary jurisdictions of the three blocs. This process has been facilitated by various forms of public political-economic policies, especially the advancement of the swap networks centered around the ECB and the PBoC. These networks function as public liquidity backstops for private offshore credit money creation. With this public-private partnership still functioning effectively, alternative money forms such as cryptocurrencies have proven to be uncompetitive and have not attained systemic importance. Overall, the structure of the IMS reflects the realities of a multipolar world under the conditions of financial globalization, which the dominating states sought to both tame and use for their own purposes at the same time.

4. International Monetary Federation (Scenario III)

In the scenario International Monetary Federation, a major shift in the IMS has taken place after a cataclysmic financial crisis, which had led to a collapse of the IMS's previous setup based on private USD creation. In reaction to the crisis, the international community was able to agree on coordinated measures and create a new architecture of international economic governance. Its monetary pillar is a multi-layered International Clearing Union (ICU) which links up individual countries and regional level clearing unions (RCUs). Implementing such a multilateral project had been unsuccessfully attempted in the past, for example at a series of world monetary conferences in the 19th century or at the 1944 Bretton Woods conference. Historically, a clearing union type arrangement was implemented in the 1950s with the European Payments Union, giving some historical precedence.

4.1 International Monetary Hierarchy

The international monetary hierarchy in this scenario is shaped by a politically planned and centrally administered mechanism. It was put in place after the cataclysmic financial crisis which had led to a near-breakdown of the world economy with massive economic uncertainty, cascading write-downs, bank failures, and a grinding halt of real sector activity. It has become widely agreed that the causes of the crisis emerged out of shadow banking and the offshore credit money markets which had become even more unstable after the 2007-9 Financial Crisis. Continued private money creation facilitated by quantitative easing resulted in massive credit money balances that remained in the system, with no clear way to sop up the excess liquidity.

When the global 'Minsky Moment' finally struck with full force, remedy was sought in Keynes' ICU-Bancor plan, which he had developed in the final years of World War II as a blueprint for the post-war IMS (Keynes 1944; see Info Box #2). The ICU-RCU framework, an adaptation of the Keynes Plan, re-introduces national currencies with fixed but adjustable international exchange rates. It is built upon the previously existing central bank swap arrangements, but re-using them for alternative purposes. The system is centralized at the BIS, which has become the key institution of the ICU framework (Duran 2015). Following up on its traditional core functions as the world's oldest international financial organization (Toniolo 2005), the BIS is both the administrator of the system and serves as a venue for central bank governors to gather and manage the ICU.

In the lead up to the establishment of the ICU-RCU framework, the political decision-making process took place in an extended G20 format and entailed a series of global treaties. The sense of urgency emanating from the crisis led to political action from all major monetary jurisdictions. In the ICU, a supranational unit of account, the Bancor, has replaced the core function previously executed by the USD as the internationally dominant national unit of account. International trade and investment has to be entirely carried out in Bancor and cleared at the BIS. National or regional units of account are pegged to Bancor in a fixed but adjustable manner. Countries running either persistent current account surpluses or deficits are penalized by an interest penalty levied on their ICU account, encouraging countries to internally adjust. However, if persistent deficits or surpluses are present, the framework calls for adjustments of the exchange rate to encourage balanced current accounts.

At a level below the ICU, RCUs have been created in some areas, either to pool regional economic strength or as a legacy of the pre-crisis arrangement. Most notably, the EMU has been transformed into a prominent RCU while re-introducing basic features of the 1950s European Payments Union. The EUR still exists as the RCU's internal unit of account but is no longer used by individuals directly, but only by member states clearing at the RCU level. Instead, national currencies have been re-introduced. The old ECB structures administer the European RCU (ERCU) along the same clearing and adjustment logic used at the ICU level. They use the remainders of the EU's real-time gross settlement system TARGET2, charging interest for balances to incentivize balanced current accounts.

Info Box #3: Keynes Plan for an International Clearing Union

In the early 1940s, the British Government asked John Maynard Keynes to develop a concept for the post-war IMS (cf. Keynes 1944). Keynes approached this task as a systems thinker with the goal to create an IMS that would i) support prosperity and demand-led growth for all nations; ii) sustain international trade and foreign direct investments; iii) keep current account imbalances in check by preventing countries from adopting neo-mercantilist strategies and systematically running current account surpluses; and iv) grant as much discretion as possible to countries for conducting their domestic fiscal, wage, and distribution policies (cf. Bibow 2009; Haas, Murau and Rini 2018; Jaeger, Haas and Töpfer 2013).

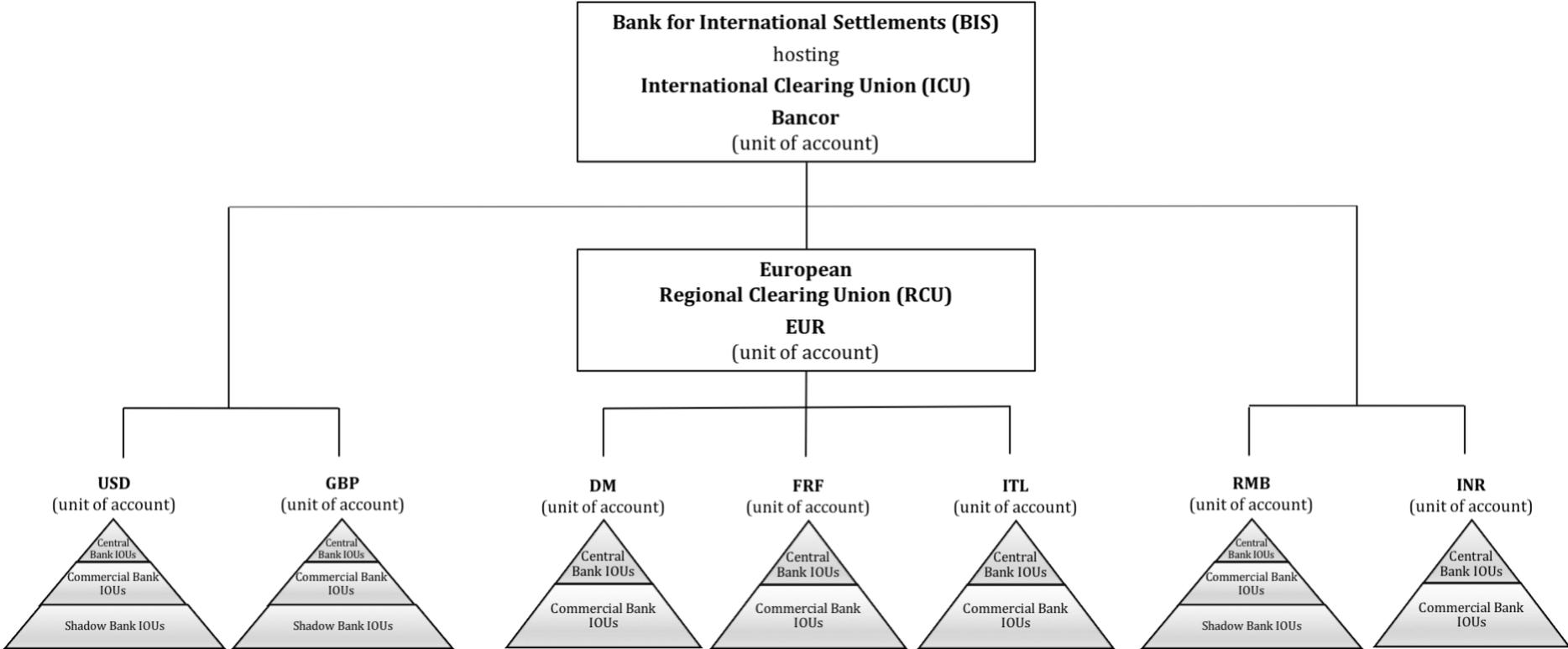
A cornerstone of Keynes' concept was the International Clearing Union (ICU). At a time in which international payments were channelled via central banks, the ICU should establish multilateral clearing between them. Keynes conceived the ICU as a supranational central bank which would issue Bancor as international credit money. To safeguard the IMS, Keynes proposed rules to run the ICU on a non-discretionary basis with incentives to avoid the build-up of current account imbalances. If such imbalances built up nevertheless, the burden of adjustment would be imposed equally on surplus and deficit countries. The ICU would consult both creditors and debtors on how to adjust. As an ultimate measure, the ICU had the discretion to adjust exchange rates—which were conceived as fixed, but adjustable—even against the will of those countries that built up the imbalances. This ultimate measure should allow the ICU to operate in a non-discretionary way most of the time.

At the Bretton Woods conference, Keynes did not find a majority for his plan to introduce a genuine international unit of account and tie the IMS to objectives for international trade. Upon US initiative, a system of fixed exchange rates was created that used the USD as key unit of account and tied it to gold. Instead of the ICU, the IMF and the World Bank became the key international monetary institutions. Still, the ICU served as a blueprint for the European Payment Union (EPU) in Europe that successfully operated in the 1950s and allowed the re-establishment of the convertibility of the involved currencies (cf. Amato and Fantacci 2012; Kaplan and Schleiminger 1989).

The ECB represents the ERCU internationally in discussions regarding the ICU within the BIS. Therefore, the ERCU does not simply represent a return of European monetary integration to the pre-Maastricht version, but a further development of the EU's monetary governance model, with a supranational European currency facilitating exchange between national currencies. Still, there is no particular international role of the EUR, as it just features as any other currency which gets cleared at the ICU. Intra-EU trade has to go through the national central banks, replacing the private, including offshore credit money creation of European banks and shadow banks with public credit money.

Figure 4 presents a schematic overview on the ICU-RCU framework. At the top of the international monetary hierarchy stands the BIS which hosts the ICU. National monetary jurisdictions are either directly connected to the ICU (as in this figure the US, the United Kingdom, China, and India) or via a RCU, which—in addition to the ICU—uses a regional clearing and balancing mechanism. Here, this option of regionalized monetary cooperation is represented in the form of the ERCU. The figure indicates three of its member states: Germany issuing German marks (DM), France issuing franc (FRF) and Italy issuing lira (ITL). The national monetary jurisdictions have kept their credit money systems but differ in the extent to which they allow shadow money creation. Some countries such as Germany have entirely abolished shadow money in their domestic hierarchy (cf. Ricks 2016).

Figure 4—Scenario III: International Monetary Federation (revolutionary-cooperative)



The policy objectives of the ICU-RCU system are three-fold: First, in light of the experience with excessive credit money claims in the run-up to the crisis, the system seeks to scale back financial globalization and reduce the ability of politically uncontrolled private credit money creation. Thus, the supply of offshore credit money has been eradicated and replaced with traditional nationally oriented banking systems, tightly managed by strong central banks. The re-nationalization of finance is also seen as a precautionary measure of firewalling against the spread of financial crises. Second, the IMS is supposed to be put at the service of international trade and growth of the economies' real sectors. Thus, by forcing all payments for international trade and investment to be channelled through national central banks and then cleared at the RCUs and ICU, the framework re-introduces political control over international finance and seeks to facilitate international trade and foreign direct investment, while minimizing large and persistent real and financial imbalances. Third, provided that the first two objectives are fulfilled, the system gives back monetary autonomy to the nation states to the greatest possible extent. States are put back into the position of managing the trade-off between inflation and unemployment, determining their wage levels and using monetary policy as a macroeconomic tool at their discretion. This shift towards more national autonomy is seen as a means for democratizing the politics of money within the ICU-RCU framework.

4.2 Public-Private Hybridity

In the International Monetary Federation scenario, the cataclysmic financial crisis has stopped and reverted the expansion of the monetary system as a self-referential network of expanding yet unstable debt claims. The system's implosion destroyed substantial amounts of wealth, held first and foremost in the form of private credit money balances. This endogenous scaling back of the system's private component has crucially shaped the public-private hybridity of the post-crisis credit money system. The ICU-RCU framework has been built on top of the ruins of the previous system, in an attempt to put private money creation under tight control of public national and international authorities. The framework emerged as an emergency measure but, at the same time, reflects the political will to avoid the re-emergence of structures in which private profit-oriented financial institutions are in the position to conduct financial innovation and fuel the credit money system's growth outside public authorities' sphere of influence. Private credit money is therefore functionally subordinate to public credit money and exists at a quantitatively much lower scale than in the present system.

The cataclysmic crisis originated in monetary jurisdictions which hosted offshore USD markets but were located outside of the Fed's swap line umbrella. The issuing institutions of USD-denominated offshore shadow money could not meet their payment obligations at maturity of the instruments and defaulted one after another. The respective central banks were unable to act as lender of last resort because they could not generate the necessary USD emergency liquidity. The defaults of these offshore shadow banks spilled over higher up in the international monetary hierarchy—to monetary jurisdictions which hosted offshore USD markets but were formally covered by the Fed's network of unlimited swap lines. The defaults continued in those monetary jurisdictions' shadow banking sectors before they infected the key markets for Eurodollar deposits, the heart of the privatized IMS. With Eurodollar lending coming to a standstill, key central banks requested unprecedented amounts of USD liquidity via the C6 swap lines. While the Fed wanted to stand by its commitment, a domestic political intervention from the ruling US administration prevented it. Politicians argued that extending loans at a multiple of the US's annual GDP, guaranteed by "US taxpayer money", was against the US national interest and could not be explained to their constituencies. Determined to no longer being "blackmailed" by an "unpatriotic" financial elite, Congress passed emergency laws rendering the Fed unable to create the emergency liquidity necessary for backstopping the Eurodollar market. The Global Financial Safety Net, constructed around the Fed's swap lines, failed. In consequence, the globalized credit money system disintegrated, ultimately also leading to failures of the domestic US banks and shadow banks.

The foundations of the ICU-RCU framework were created as an emergency measure when the crisis was continuing with ever more institutions defaulting and private credit money balances vanishing. With the private offshore USD system collapsing, the financial plumbing for international trade has disintegrated. To avoid the complete breakdown of the world economy and a mutually destructive national re-orientation of the economies as had happened during the Great Depression, the G20 agreed on an alternative ad hoc system, administered by national central banks and centralized at the BIS. The system could be put on a multilateral basis with a purely international organization at its core because the US were substantially weakened as monetary hegemon and no other country stood ready to replace it. As the domestic US monetary system was failing and enormous political turmoil ensued, the new US administration found it no longer in their interest to have the Fed both in charge of national and international financial stability. To provide for the desperately needed international liquidity necessary to revamp international trade, the G20 jump started an alternative international public credit money system. Existing bilateral central bank swap agreements were centralized at the BIS, which introduced Bancor as an international unit of account. Central banks started to create Bancor balances to manage payment transactions in between them, which in turn coordinated international trade finance. The name Bancor was chosen with reference to the Keynes Plan, which had become widely popular during the crisis, in the hope to substantiate faith in the new system. In effect, Bancor became a form of international public credit money, replacing the function that had previously been fulfilled by the private Eurodollar deposits.

The RCU component of the system emerged out of the emergency measures as well; the EMU was in the lead of creating it, but it has later come to be endorsed by the G20 as a blueprint for other monetary regionalization projects. The institutional architecture of the Maastricht regime did not survive the crisis. The collapse came from two sides: A number of EMU deficit countries such as Italy, Spain and Portugal had for a long time wished to leave the Eurozone because they experienced its economic governance mechanism merely as a straightjacket leading to a continuous deterioration of their living standard. At the same time, surplus countries such as Germany no longer wanted to tolerate that they had to finance and guarantee for the deficit countries through balances in the intra-EMU TARGET2 payments system. In a mutual agreement for a 'divorce', EMU governments seized the window of opportunity during the crisis to withdraw from the monetary union. Under the pretext of supporting and re-structuring the defaulting banks and shadow banks, they managed the writing off of private EUR and USD balances and re-introduced their old domestic units of account. In emergency meetings closely attuned with the G20 sessions on rescuing the IMS, the EMU countries' heads of state and government decided to integrate their currency bloc into the ICU framework and reorganize the ECB as a European RCU (ERCU), which was supposed to form the center of the monetary pillar in the EU Single Market and be in charge of managing an intra-EU system of fixed but adjustable exchange rates. They decided to leave the EUR in place as pure public unit of account to administer the payments in between the EU's national central banks, which in turn were at the top of their domestic hierarchy of money and administered their respective national units of account.

In consequence, the collapse of the credit money system and the establishment of the ICU-RCU framework have fundamentally altered the institutions of international monetary governance. The G20 plays a key role as an executive body. On the level of states and governments, the G20 has set up the ICU-RCU framework in the first place. On the level of finance ministries and central banks, the G20 provide the guidelines for policy decisions in conjunction with the BIS, which administers and operates the system. With its new function, the BIS has undergone a profound institutional transformation and now represents the heart of the IMS. The IMF, by contrast, plays a less central role in the ICU-RCU framework. It continues to function as an emergency lending and consulting institution, but is rather considered a dated relic.

4.3 Onshore-offshore Dualism

With an International Monetary Federation, formal offshore credit money creation has officially ceased to exist because attempts have been made to eliminate it. The abrogation of offshore credit money creation in the ICU-RCU framework represents an attempt to return to the principle of the ‘Westphalian monetary system’, following the logic of ‘One Country-One Currency’ (Cohen 2008). Neither the use of nor the creation of a foreign unit of account is allowed in any given monetary jurisdiction. Financial globalization, i.e. the ability of private financial institutions to create transnational private credit money, has radically been scaled back.

In the cataclysmic financial crisis, private offshore credit money creation by banks and shadow banks—e.g. in the offshore USD realm—has collapsed. In the post-crisis IMS, offshore deposits and shadow money remain suppressed because the ICU-RCU framework only allows for private credit money creation onshore, under the tight control of national central banks. Offshore public credit money creation has disappeared as the C6 and other swap networks have been fully absorbed by the ICU structures. In today’s system, ‘offshore’ suggests that a given monetary jurisdiction’s unit of account is used for credit money creation in another monetary jurisdiction. In the ICU-RCU framework, Bancor and EUR represent genuinely international units of account, and their creation is better to be thought of as taking place in a genuine ‘international credit money realm’.

That being said, the highly centralized and politically controlled nature of the ICU-RCU framework creates space for private initiative to find ways to bypass it. The needs for keeping the system stable by managing current account imbalances through adjusting exchange rates are prioritized higher than what is efficient or desirable on an individual level. Firms in the US and Germany, for example, may find it more attractive to find direct agreements with each other than going the complicated way through the ICU and the ERCU. Moreover, there are various types of international transactions which cannot or do not want to use the public channels. We therefore expect that new forms of alternative private moneys would emerge to satisfy this demand for financial transactions outside of the ICU-RCU frameworks. Historical precedents for such a process is the emergence of the Eurodollar market in the Bretton Woods System or the role of bills of exchange in international trade from the Middle Ages to the 19th century. In the mid-21st century, cryptocurrencies and the blockchain technology may fill this gap and increase in their relevance as international money.

Tables 4a and 4b depict the monetary systems of the US and Germany as examples to highlight what the new monetary systems look in terms of instruments (bold indicates an increase, italics a decrease in volume and relevance). In the international realm, the US is a direct member of the ICU because the Fed has its own Bancor account there, whilst Germany is only an indirect member and is represented via the ERCU. The Bundesbank holds a EUR account at the ERCU to provide for regional clearing in Europe, while international clearing is carried out through the ICU in Bancor. The structure of onshore monetary systems differs from country to country. In the US, various forms of USD-denominated onshore central, commercial and shadow bank money remain in place. While the use of currency has decreased, that of wholesale and retail bank deposits as well as shadow money has increased. MMFs are regulated as commercial banks, so MMF shares become formally identical to bank deposits. Still, the US continue to allow a certain degree of financial liberalism and keep non-banks in place which are issuing forms of shadow money. Germany, by contrast, has starkly altered its domestic system. Not only has it highly regulated national finance and eliminated all forms of shadow money. It has also changed Bundesbank policies and re-introduced the Real Bills Doctrine, according to which the central bank only conducts monetary policy by discounting ‘real’ commercial credit, effectively bringing back a system that had been in place before the introduction of the EMU (cf. Chailloux, Gray and McCaughrin 2008; critical: Mints 1944). These discrepancies of onshore monetary jurisdictions can be thought of as a consequence of taking the politics of money out of the depoliticized technocratic sphere and making them subject to democratic decision-making. The differences between the US and the German system thus reflect variations of national preferences about the extent to which private credit money creation is socially accepted.

Onshore USD Realm	International Realm
<i>National USD-denominated credit money issued in the US</i>	<i>International credit money issued outside of the US</i>
	ICU IOUs issued by the BIS <ul style="list-style-type: none"> ▪ Bancor deposits
Federal Reserve IOUs <ul style="list-style-type: none"> ▪ Fed deposits ▪ <i>Fed currency</i> 	
US commercial bank IOUs <ul style="list-style-type: none"> ▪ US wholesale deposits ▪ US retail deposits 	
US shadow bank IOUs <ul style="list-style-type: none"> ▪ Various onshore private credit money form 	

Table 4a—Evolution of the USD’s onshore-offshore dualism

Onshore DM Realm	International Realm
<i>National DEM-denominated credit money issued inside of Germany</i>	<i>International credit money issued outside of Germany</i>
	ICU IOUs issued by the BIS <ul style="list-style-type: none"> ▪ Bancor deposits
	RCU IOUs issued by the BIS <ul style="list-style-type: none"> ▪ EUR deposits of EU central banks
Bundesbank IOUs <ul style="list-style-type: none"> ▪ Bundesbank deposits ▪ Bundesbank currency 	
German commercial bank IOUs <ul style="list-style-type: none"> ▪ German wholesale deposits ▪ German retail deposits 	

Table 4b—Evolution of the DM’s onshore-offshore dualism

In sum, the scenario of an International Monetary Federation sketches a future which has been crafted by states in the aftermath of a cataclysmic crisis, which has provided a window of opportunity for deep systemic reform. As political cooperation succeeded in the decisive moments, the ICU-RCU framework was founded, establishing the BIS as the core institution of the IMS. International money creation is primarily executed by central banks at the BIS through the issuance of Bancor as public credit money, which has replaced the private offshore USD system. Offshore credit money creation has been dried out, and private money creation has been put under the control of national authorities. New autonomy for national monetary jurisdictions has led to a more heterogeneous setup of nation states, in which different national preferences for the monetary system are better represented. Still, as the system creates inefficiencies and is prone to overregulation, there are incentives to bypass it, which in the long-run may well have a destabilizing effect. Overall, the structure of the IMS reflects a future in which international technocrats are at the peak of their power and influence through a tightly knit system, while nation states have regained some domestic monetary autonomy but lost influence on international monetary governance.

5. International Monetary Anarchy (Scenario IV)

In the scenario International Monetary Anarchy, a cataclysmic financial crisis has occurred in the privatized global credit money system, but could not be met with a coordinated political reaction. Leading politicians and technocrats were not able to work together constructively within the existing institutions of international monetary governance. Countries and regions stumbled out of the crisis in turmoil, unable to rescue the international financial plumbing or replace it with alternative structures. As a consequence, international trade has largely come to a halt and the world economy has collapsed. The historically contingent, system-like monetary hierarchy of states has given way to a setup with no clear international monetary hierarchy at all. International monetary relations have ended up in an anarchic non-system, in which countries have become mainly autarchic and try to manage things on their own. At the same time, the crisis has left a vacuum, and various forms of credit and non-credit money compete to fill it. Historical precedents for such a situation could for example be found during and shortly after major destructive wars when the existing public and private monetary institutions ceased to function adequately and instead ad hoc monetary and barter arrangement emerged. The most recent example being the time after the World War II when many European countries experienced major shortages of foreign currencies which severely hampered international trade (cf. Kaplan and Schleiminger 1989). International monetary anarchy would probably not be a permanent institutional equilibrium but rather a transitory state out of which new institutions for international money provision and new forms of international political order would emerge.

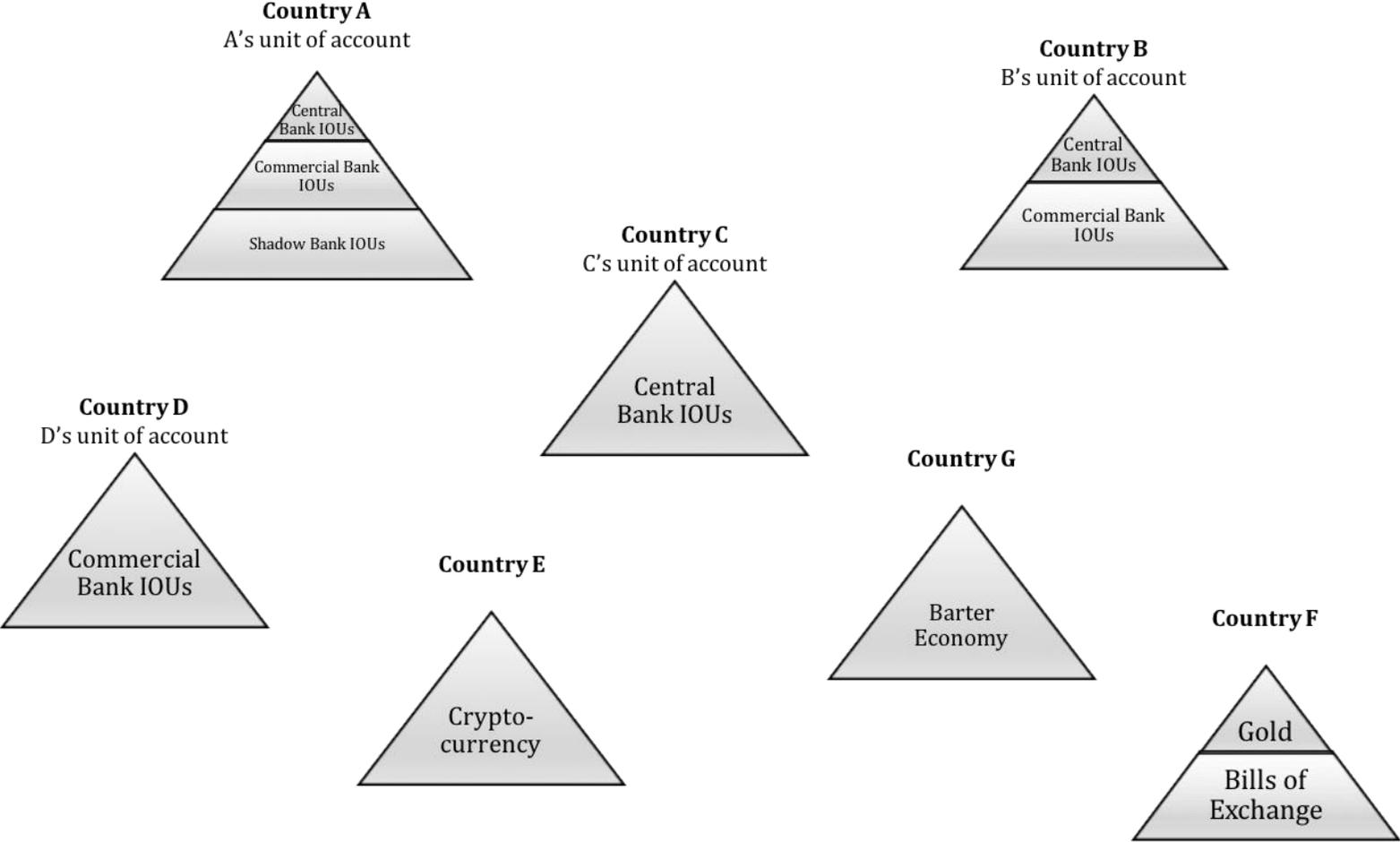
5.1 International Monetary Hierarchy

When the cataclysmic crisis was unfolding, the existing Global Financial Safety Net, centered around the Fed as the global backstop with its network of central bank swap lines, failed. The US did not act as a strong monetary hegemon who was able and willing to provide emergency liquidity to rescue the system as in the 2007-9 crisis, and there was no organized joint political response of the key states within the existing institutions of international monetary governance such as the G20, the IMF or the BIS (as in Scenario III). As a consequence, the crisis entailed an unorderly default of wealth, with masses of private credit money balances being destroyed. The dissolution of these balances caused heavy turmoil both in the financial and the real sector, leading to massive write-offs both of wholesale and retail credit money. This wracked havoc on most economies and triggered political unrest around the globe.

With the US unable to sustain its global hegemony and states unable to agree on cooperation in international monetary affairs, a pattern of heterogeneous, independent monetary jurisdictions has emerged out of the crisis that manage their domestic affairs with little international cooperation. The EMU has completely dissolved. Its member states have chosen the path of an unorderly retreat to national monetary systems, essentially reverting the process of European monetary integration that had commenced after World War II. With their domestic banks and shadow banks failing in the crisis, EMU member states used the turmoil to re-nationalize the politics of money, re-introduce their previous currencies and re-structure their domestic monetary systems according to their specific national preferences. There is no comprehensive approach globally, and states have become much more internally oriented, experimenting with a variety of their own respective monetary systems. Some central banks have achieved national monetary autonomy. Others remain dependent on other influential players, while some countries deliberately decide for monetary cooperation in their region. Thus, a patchwork of solutions and institutional frameworks has emerged; some states have sought to replicate the pre-crisis system domestically, while others have come-up with innovative solutions—some failing, others succeeding.

Figure 5 depicts the setup of the IMS. The monetary jurisdictions co-exist next to each other in an unsystematic way. Each one has found its own way of organizing its domestic monetary system.

Figure 5—Scenario IV: International Monetary Anarchy (revolutionary-competitive)



In visualizing this scenario, we found it unnecessary to be more specific about who exactly these monetary jurisdictions are. Instead, we represent various monetary jurisdictions that react to the international monetary anarchy with different choices regarding the setup of their domestic monetary hierarchies: Country A continues with a structure of central, commercial and shadow banks, which issue various forms of credit money and denominate them in A's unit of account. Country B tries to resort to a 1950s style regulated banking system without shadow money. Country C represents a full-reserve banking approach with only the central bank as a public institution in charge of money creation; commercial banks exist but only distribute central bank money without being able to autonomously create it. Country D, in turn, has implemented a free banking model without a central bank. Country E experiments with a pure cryptocurrency system, Country F with a pre-modern gold cum bills of exchange system, whilst Country G has resorted to abandoning money in general and becoming a barter economy.

Overall, a clear international hierarchy of monetary jurisdictions has disappeared as the cataclysmic financial crisis has led to a breakdown not only of the IMS but of lasting international political cooperation on monetary matters in general. The notion of hierarchy comes from the understanding of the IMS as an international payments system of different monetary jurisdictions using their own respective units of account. If the institutions of the international payments architecture disintegrate, so does the notion of hierarchy. Instead, a pattern of heterogeneous independent states has emerged that manage primarily domestic affairs. This setup represents a true non-system.

In this setting, we can see ad hoc collaboration on international monetary affairs, but nowhere even near the scale of the pre-crisis times. In terms of systematic international trade, international barter arrangements have emerged to compensate for the lack of a functioning IMS, and for the most part only bilateral economic interaction is possible. Exchange rates arrangements are again characterized as 'anything goes', with some countries pegging to larger neighbors and others floating their exchange rates. Convertibility between money forms of different monetary jurisdictions is not always guaranteed. In the unpredictable economic climate, countries are routinely forced off their pegs, entering periods of wild fluctuation before re-pegging at drastically different rates. The results for economic activity have been predictably dismal.

5.2 Public-private Hybridity

In the crisis, the monetary system as a self-referential network of expanding yet unstable debt claims has imploded. The crisis started in the least protected segment of the IMS—that of USD-denominated offshore shadow money forms issued in monetary jurisdictions not covered by the Fed's swap line umbrella. From this outer periphery, the contagion spread towards the apex. It affected the major monetary jurisdictions and Eurodollars as the key source for global liquidity. When the Fed due to domestic political reasons was not able to stand by its commitment to act as a global lender of last resort via its swap lines, an actual 'financial meltdown' materialized. Masses of wealth held in the form of credit money balances have become annihilated. The network of public and private IOUs, issued on various layers of the monetary hierarchy, onshore and offshore, were substantially scaled back. With a coordinated response failing, international trade has largely come to a halt. Economies have become inward-oriented, and policy-makers found various differing approaches to navigate their domestic monetary affairs in this anarchic setting. Some monetary jurisdictions have entirely abandoned credit money, others have decided to fully or partly stick to credit money. The latter differ with regard to the public-private hybridity they allowed to manifest in their domestic systems. Some systems remain hybrid, others are fully private or fully public.

One of the reasons for this heterogeneity in the approach towards the public-private hybridity is profound intellectual disagreement about the best conclusions to draw out of the cataclysmic crisis. Some policy-makers have come to be convinced that the ability of private institutions to create money in general is the reason behind the crisis and consequently have abolished it in their domestic post-crisis monetary system. Some blame the crisis on the public side of the monetary system, suggesting

that the existence of public backstops for centuries has enabled the private debt network to grow to such size that it has become ‘too big to save’, and opt for a purely private system. For others, in turn, the crisis has demonstrated that the system’s self-referential character—the fact that credit money is nothing else but a promise to pay, again, credit money—is nothing but a gigantic scam. The people’s faith in the system, which would be inherently necessary to run it, has disappeared as the institutions that had been responsible for stabilizing the debt network have failed. In this sense, the post-crisis era gives room for testing alternative ways of organising the monetary system.

The collapse of the credit money system and the general tendency to retreat towards autarchy has had its effects on the institutions for international monetary governance. Fora such as the G7/8 or the G20 have lost their reputation and are effectively not used any more. The BIS remains in place as a venue for informal debates among central bankers, but in a non-system without much international collaboration, there is not much to discuss. Lastly, while the IMF has not been closed down, it is barely operational. In fact, in an international situation where it is most needed, states cannot rely on its functionality. New institutions have not (yet) been created as mechanisms for international collaboration, and an agreement for how to tackle the situation is missing.

5.3 Onshore-offshore Dualism

In the International Monetary Anarchy scenario, the offshore private credit money system has disintegrated but it has not been replaced with any coherent alternative. This leads to a fragmented amalgam of public and private money forms, created predominantly onshore. Financial globalization as we know it has thus been radically scaled back. However, offshore credit money creation has not actively been forbidden as the institutions to implement such a prohibition are missing. From the supply side, offshore credit money creation is possible if a given monetary jurisdiction allows financial institutions to issue IOUs denominated in another monetary jurisdiction’s unit of account. It is only feasible, however, if there is also demand for it. This leads to experimentation with various credit money forms potentially being created and used in various monetary jurisdictions. It resembles a situation before the introduction of the ‘Westphalian Monetary System’ when the modern nation state had developed its monopoly in monetary affairs, primarily by determining the national money of account (Cohen 1998). Under such circumstances, the world has entered into what may be described as an era of Hayekian currency competition (cf. Hayek 1976).

In the heterogeneous monetary jurisdictions, a great variety of onshore credit money forms have emerged. Central bank and commercial bank IOUs prevail in many countries, depending on whether they have opted for a hybrid, fully public or fully private system. Given the overall uncertainty, physical bank notes and coins have returned as the key money form in some countries. Other countries have also introduced rules for backing their central bank IOUs with real assets such as gold or commodities as there is a tendency after the big crisis to resort back to the ‘good old days’. The role of onshore shadow money is different in each monetary jurisdiction. In weak states with the rule of law not guaranteed and a weak government, as expected we find a preference for collateralized lending, giving onshore repos a comparative advantage over onshore deposits.

In terms of offshore public credit money, the network of central bank swap lines remains formally in place but is not in consistent use and not perceived as reliable. Networks of central bankers may still be in touch via the BIS, and if they encounter an urgent state of emergency they are fine with lending to each other using the established network of swap lines. However, the actual use of the swap lines depends on the national setup of the respective monetary systems. In countries with a free-banking setting without central banks, central bank swap lines have effectively disappeared automatically.

Offshore private credit money creation in the patchwork system has become equally fragmented but contributes to a situation of currency competition. Offshore commercial bank IOUs such as Eurodollar deposits partly remain in place, as under anarchic conditions there is no way to prevent their creation. However, the functionality of offshore deposits has been greatly reduced. In the absence of any

effective international financial governance, using offshore deposits has become much more risky and unreliable as the principles of the rule of law are challenged. What remains of offshore shadow money is used to get around stringent regulations in certain states, but is severely hindered by the high uncertainty of the anarchic setting. However, as there is no political power to outlaw offshore shadow bank IOUs, and some private actors and policy makers see a role for them, offshore shadow bank money continues to play a role, in particular when it is collateralized.

Cryptocurrencies have seen a much larger role under conditions of International Monetary Anarchy than in the other scenarios. This is due to the failure of central bank backed currencies, which means that cryptocurrency banking models are comparatively more competitive. Public cryptocurrency arrangements have emerged, either in conjunction with central banks or treasury departments. Private crypto currencies are also prevalent, with their non-state unit of accounts increasingly used to facilitate both national and international real and financial transactions. Different banking business models have emerged and compete to satisfy banking needs both nationally and internationally. Some jurisdictions which had allowed traditional cryptocurrency activity began strict regulation and even ban shadow crypto banking.

In sum, the scenario of International Monetary Anarchy provides the rough sketch of a future in which many of the features we are accustomed to in conjunction with money are no longer present. Convertibility and the ability to make international payments can no longer be taken for granted. What actually constitutes money and what not has become highly heterogeneous. It is a situation of high uncertainty. However, as the foundations of the previous system of globalized finance via offshore credit money creation has been demolished in its foundations, this situation constitutes a breeding ground for new monetary structures to emerge that will likely create a new systemic structure for the IMS. Overall, the political economic situation after the cataclysmic crisis reflects an anarchic international system with dysfunctional international institutions and a highly unstable geopolitical environment.

6. Conclusion

Our lens for viewing the IMS has been built upon the Money View, which we have employed in a scenario building exercise informed by economic history and contemporary trends. The Money View is a market-based credit theory of money which holds that money forms exist along a public-private spectrum, and along a hierarchy of quality or convertibility. In both international and domestic cases, the central bank is the issuer of the highest quality type of money, which is sought after especially in times of crisis. In traditional thinking about the role of the central bank, this ‘flight to quality’ mechanism operates domestically through central bank backstops of private money creation.

The particular novelty of this paper on possible futures of the IMS is that, to develop its scenarios, it uses a depiction of the IMS as starting point which emphasizes the systemic relevance of private offshore credit money creation in USD through Eurodollar deposits and offshore shadow money forms. In today’s IMS, this is backstopped internationally through central bank swap lines, which ensure the ability of central banks to lend to financial institutions which have engaged in banking activity in foreign currency—a currency the central bank cannot simply create on its own. The C6 swap lines established between the Fed and five major central banks thus represent one of the most systemically important aspects of the IMS, and underline the Fed’s commitment to facilitating the continued functioning of the dollar hegemonic international system.

In our scenario building exercise, we engaged with two major criteria to determine the path the system could take. To arrive at the four scenarios, we have implemented a bifurcation logic based on two fundamental questions: whether or not a large-scale global financial crisis strikes within the next two decades which induces a change of the system (in contrast to minor crises that are only accompanied by changes within the system), and whether or not the logic of political cooperation prevails internationally. In the case that no major financial crisis occurs, we follow an evolutionary path in which we assume no deviation from the nature of today’s IMS. Thus, we see either a continuation of today’s IMS with the US as a single monetary hegemon, Continued Dollar Hegemony; or several blocs under the leadership of the US, China and the EU in Scenario II, Competing Monetary Blocs. Both scenarios emerge organically out of the contemporary IMS based on USD-denominated private money creation. If a major crisis materializes, we follow a revolutionary path with a systemic shift of the nature of the IMS. Our assertion is that a cataclysmic crisis would change the setup of the system fundamentally, both because of the actual damage to the institutions and stores of wealth, and because the vacuum left by the crisis would require new institutions to be established in order for the international system to begin functioning again. Our Scenario III, International Monetary Federation, represents the outcome of a joint international effort after the crisis. It sees the emergence of an ICU-RCU framework in the spirit of the system proposed by Keynes ahead of the Bretton Woods conference. This scenario requires the largest amount of global cooperation, both to set up and to adhere to the system. Finally, International Monetary Anarchy is the outcome of a breakdown in international cooperation, and the failure of leading states to recreate a functioning IMS.

It is important to reiterate that our intention in developing those scenarios has not been to think through every possible outcome. Rather, we have attempted to identify and point to potential trajectories. Scenarios I or II assume that the contemporary offshore USD system keeps its key systemic role. In Scenario I, offshore dollar creation in USD remains unchallenged and continues to develop while new forms of USD-denominated private credit money emerge. In Scenario II, the offshore USD system receives substantial competition from China and the Eurozone. The global reach of the USD is scaled back as offshore money creation takes place only within the monetary jurisdictions that are peripheral to the center of the respective bloc. In Scenario III, offshore USD creation as a key feature of the IMS is abrogated. The ICU-RCU framework trades in the traditional hegemonic structure of the IMS for an overarching clearing union which is supported by the global community and administered by multilateral institutions, using their own unit of account. Finally, Scenario IV’s international monetary anarchy depicts an ‘anything goes’ situation that sees various degrees of offshore money creation in absence of a true hegemon, but rather simply stronger and weaker states.

In the four scenarios, the particular importance of offshore shadow money—which plays an important, yet typically under-recognized role in today’s IMS (Murau 2018)—is a reflection of the degree to which USD hegemony remains in place. In Scenario I, offshore shadow money makes up a large portion of the offshore credit creation. FX swaps have surpassed MMF shares as most important form of offshore dollar shadow money. In Scenario II, offshore shadow money is systemically important in all three blocs. For the USD and the RMB bloc this is due to deliberate bloc policies similar to Scenario I, while for the EUR bloc, offshore shadow money creation has emerged as an unintended consequence of heavy onshore regulation. Scenarios III and IV see similar fates for offshore shadow money as offshore credit money; eliminated in Scenario III, while in Scenario IV ‘anything goes’, but the systemic importance of offshore shadow money is drastically reduced.

With regard to public credit money in the IMS, the scenarios carve out different evolutionary trajectories for the central bank swap lines led by the Federal Reserve which are discussed as the core of today’s Global Financial Safety Net. As a direct offshoot of the changing role of the offshore dollar system in the scenarios, the prominence of the C6 swap lines differs in each scenario. In the business as usual Scenario I, we see a continued systemically important role for the swap lines. Scenario II sees the Fed, the ECB and the BoC using swap lines strategically within their respective monetary blocs to support the system. With the abandonment of offshore dollar creation, Scenario III’s ICU-RCU system does away with the need for the C6 swap lines. International transactions are handled through the clearing unions. Scenario IV’s mixed bag of currency arrangements means the actual use of the swap lines depends on the national setup of the respective monetary systems. However, they play a less prominent role than in today’s IMS.

At the overall level of financial globalization, Scenario I sees the C6 swap lines perceived as credible and continuing to fuel the system’s growth and international connectedness. In Scenario II, Chinese holdings of USD reserves and continued economic interaction between the two blocs sees increased linkage between the US and Chinese economic and financial actors. In contrast, the EU moves in the direction of ring-fencing its financial sector in order to support regional financial stability. Scenario III’s ICU-RCU system represents an IMS that is vastly different than today’s; finance is largely contained by national boundaries and international private money creation curbed. Finally, Scenario IV sees a radical reduction in globalization, with much less international trade and little systemic international financial activity.

To summarize those points, Table 6 provides a comparative overview on major aspects of the international political economy as we envision it in the four scenarios. It touches upon the shape of the international system of states, the way in which monetary governance is conducted internationally, the prevailing exchange rate arrangements and the organization of international financial regulation. Taken together, these aspects point towards the future of financial globalization as is manifested in the four scenarios. Table 7, in turn, presents a comparative overview on the future of offshore credit money creation in the scenarios. To this end, it addresses the logic of monetary expansion in connection to the key features of today’s IMS: offshore deposits, offshore shadow money and central bank swaps.

As a final thought, we want to emphasize that this scenario building exercise unavoidably has its limitations. Perhaps most importantly, we cannot say on normative grounds which scenario is ‘better’, understood as more resilient and prone to financial stability, as a comprehensive toolkit for identifying systemic risk in the IMS has not been developed here. We argue that systems science can provide approaches to developing an adequate theory and methodology for assessing the systemic risks embedded in the IMS. This toolkit could then be used both to dig deeper into the potential *causes* of a major financial crisis based on the trajectory of today’s IMS, and also to evaluate systemic risks inherent in the four scenarios we have developed. The next step in such an analysis would be to evaluate policy proposals which could best deal with the systemic risks identified.

Table 6—Comparative Overview on the International Political Economy of the Four Scenarios

	Scenario I: Continued Dollar Hegemony	Scenario II: Competing Monetary Blocs	Scenario III: International Monetary Federation	Scenario IV: International Monetary Anarchy
International System	Hegemony: Pax Americana	Competition: US bloc co-existing with EU bloc and Chinese bloc	Cooperation: Multilateral int. economic order, organized around ICU-RCU framework	Anarchy: Heterogeneous, independent states managing domestic affairs with little international cooperation
International Monetary Governance	Relatively homogenous national monetary systems integrated in US dominated international system	Regionally homogeneous monetary systems, bigger differences between the US-, EU- and China-centered blocs	Politically institutionalized monetary cooperation in ICU and RCUs; more room for political & economic diversity between and within regions	Non-system without substantial public or private international credit money creation
Exchange Rate Arrangements	Flexible exchange rates between major currencies, minor currencies tend to be pegged to major ones	Flexible exchange rates between the blocs, smaller countries peg to the dominant currency in their respective bloc	Fixed but adjustable exchange rates both within ICU and RCUs	Anything goes; some floating exchange rates with varying degrees of volatility, some pegs; convertibility not always ensured
International Financial Regulation	Co-evolution of private actors who seek to escape regulation and regulators attempting to keep up	Liberal bloc around the US with light touch regulation; heavy handed regulation in EU bloc; state-managed bloc around China with regulations promoting financial expansion	With nationally oriented banking systems, post-crisis regulations provide baseline recommendations, but most states introduce tougher domestic standards	Pre-crisis regulations still formally in place, but almost meaningless as states do not necessarily comply anymore
Financial Globalization	Continues to expand under US leadership; backstops via C6 swap lines seen as credible and fuel the system's growth and international connectedness	Close entangling of US & China with international promotion of their units of account; EU ring-fences financial sector and is more loosely connected to the other blocs	Radically scaled back; financial sectors are predominantly national again	Radically turned backed, no systematic offshore credit money creation, much less international trade, with occasional international barter arrangements

Table 7—Comparative Overview on the Credit Money System in the Four Scenarios

	Scenario I: Continued Dollar Hegemony	Scenario II: Competing Monetary Blocs	Scenario III: International Monetary Federation	Scenario IV: International Monetary Anarchy
Logic of monetary expansion	Dominance of private international money creation via offshore dollars	Dominance of private international money creation in the blocs' peripheries via offshore USD, offshore EUR & offshore RMB, respectively	Strong publicly organized international monetary system; private money creation subordinate and only on the national level	No substantial international money creation, only national money creation, public or private or hybrid
Offshore deposits	Offshore USD deposits remain by far the most important form of international credit money	Offshore USD deposits still play the most important role but no longer have hegemonic status next to offshore EUR and RMB	Offshore deposit creation abrogated and fully shifted back onshore; the G-20 recommends that national banking systems are based on discounting real commercial bills	Minor offshore USD deposits, as under anarchic conditions there is no way to prevent their creation: however, greatly reduced functionality of offshore deposits.
Offshore shadow money	FX swaps have surpassed MMF shares as most important form of offshore USD shadow money	Offshore shadow money has systemic role for USD and RMB due to deliberate bloc policies, and for the EUR as unintended consequence of heavy onshore regulation	Offshore shadow money creation is fully abrogated; national financial systems are free to allow or abolish onshore shadow money creation	What remains of offshore shadow money is used to get around stringent regulations in certain states, but is severely hindered by the high uncertainty of the anarchic setting
Central bank swaps	Central bank swap lines with the US Fed at the center backstop the private offshore dollar system	Regional swap lines form the central backstops in the private offshore credit money systems of the respective blocs	Central bank swap lines no longer needed as backstops in the ICU-RCU framework; central bank swaps at BIS used in transition to ICU-RCU framework	Some central bank swap lines may remain in place pro forma but are not in consistent use

Literature

Amato, Massimo and Fantacci, Lucca (2012): *The End of Finance*, Cambridge: Polity Press.

Avdjiev, Stefan, McCauley, Robert, and Shin, Hyun Song (2015) *Breaking Free of the Triple Coincidence in International Finance*, Bank for International Settlements, BIS Working Papers No. 524.

Awrey, Dan (2017) 'Brother, Can You Spare a Dollar? Designing an Effective Framework for Foreign Currency Liquidity Assistance', *Columbia Business Law Review* (forthcoming).

Bernes, Thomas A., Jenkins, Paul, Mehrling, Perry and Neilson, Daniel H. (2014) *China's Engagement with an Evolving International Monetary System. A Payments Perspective*, Centre for International Governance Innovation (CIGI) and Institute for New Economic Thinking (INET), Special Report.

Bibow, Jörg (2009) *Keynes on Monetary Policy, Finance and Uncertainty. Liquidity Preference Theory and the Global Financial Crisis*, London and New York: Routledge.

Bibow, Jörg (2010) *Bretton Woods 2 Is Dead, Long Live Bretton Woods 3?*, Levy Economics Institute of Bard College, Working Paper No. 597.

Braun, Benjamin (2015) 'Preparedness, Crisis Management and Policy Change. The Euro Area at the Critical Juncture of 2008-2013', *The British Journal of Politics and International Relations* 17 (3), pp. 419-441.

Brunnermeier, Markus K. (2009) 'Deciphering the Liquidity and Credit Crunch 2007-2008', *Journal of Economic Perspectives* 23 (1), pp. 77-100.

Borio, Claudio, McCauley, Robert, and McGuire, Patrick (2017) 'FX Swaps and Forwards. Missing Global Debt?', *BIS Quarterly Review* September 2017, pp. 37-54.

Burn, Gary (2006) *The Re-Emergence of Global Finance*, London: Palgrave Macmillan.

Cecchetti, Stephen G. (2008) *Crisis and Responses. The Federal Reserve and the Financial Crisis of 2007-2008*, National Bureau of Economic Research, Working Paper 14134.

Chailloux, Alexandre, Gray, Simon and McCaughrin, Rebecca (2008) *Central Bank Collateral Framework. Principles and Policies*, International Monetary Fund, IMF Working Paper, WP/08/222, September 2008.

Cohen, Benjamin J. (1977) *Organizing the World's Money. The Political Economy of International Monetary Relations*, New York: Basic Books.

Cohen, Benjamin J. (1998) *The Geography of Money*, Ithaca and London: Cornell University Press.

Cooper, Richard N. (1975) 'Prolegomena to the Choice of an International Monetary System', *International Organization* 29 (1), pp. 63-97.

- Denbee, Ed, Jung, Carsten, and Paternò, Francesco** (2016) *Stitching Together the Global Financial Safety Net*, Bank of England, Financial Stability Paper No. 36.
- Derbyshire, James and Wright, George** (2017) 'Augmenting the Intuitive Logics Scenario Planning Method for a More Comprehensive Analysis of Causation', *International Journal of Forecasting* 33 (1), pp. 254-266.
- Desan, Christine** (2014) *Making Money. Coin, Currency, and the Coming of Capitalism*, Oxford: Oxford University Press.
- Drescher, Daniel** (2017) *Blockchain Basics. A Non-Technical Introduction in 25 Steps*, Frankfurt am Main: Apress.
- Duran, Camila** (2015) *Avoiding the Next Liquidity Crunch. How the G20 Must Support Monetary Cooperation to Increase Resilience to Crisis*, University of Oxford, Global Economic Governance Programme, Policy Brief, October 2015.
- Eichengreen, Barry J.** (2008) *Globalizing Capital. A History of the International Monetary System*, Princeton: Princeton University Press.
- Eichengreen, Barry J.** (2009) *Out of the Box Thoughts about the International Financial Architecture*, International Monetary Fund, IMF Working Paper WP/09/116.
- Eichengreen, Barry J.** (2014) *International Currencies Past, Present and Future. Two Views from Economic History*, Bank of Korea, BOK Working Paper No. 2014-31.
- Eichengreen, Barry J., Mehl, Arnaud and Chițu, Livia** (2018) *How Global Currencies Work. Past, Present and Future*, Princeton: Princeton University Press.
- Elliott, Douglas and Yan, Kain** (2013) *The Chinese Financial System. An Introduction and Overview*, Brookings Institution, John L. Thornton China Center, July 2013.
- Elliott, Douglas, Kroeber, Arthur and Qiao, Yu** (2015) *Shadow Banking in China. A Primer*, Brookings Institution, Economic Studies at Brookings, March 2015.
- Ellman, Michael** (2014) *Socialist Planning*, Cambridge and New York: Cambridge University Press.
- Farhi, Emmanuel, Gourinchas, Pierre-Olivier, and Rey, H el ene** (2011) *Reforming the International Monetary System*, London: Centre for Economic Policy Research (CEPR).
- Flandreau, Marc** (2004) *The Glitter of Gold. France, Bimetallism, and the Emergence of the International Gold Standard, 1848-1873*, Oxford: Oxford University Press.
- FSB** (2011) *Shadow Banking. Scoping the Issues*, Financial Stability Board, Background Note, 12 April 2011.
- Gabor, Daniela** (2016) 'The (Impossible) Repo Trinity. The Political Economy of Repo Markets', *Review of International Political Economy* 23 (6), pp. 967-1000.
- Gabor, Daniela and Vestergaard, Jakob** (2016) *Towards a Theory of Shadow Money*, Institute for New Economic Thinking, INET Working Paper.

Haas, Armin, Murau, Steffen and Rini, Joe (2018) On Tight and Loose Coupling in the International Monetary System, Institute for Advanced Sustainability Studies, IASS Working Paper (forthcoming).

Hayek, Friedrich August von (1976 [1990]) Denationalisation of Money - The Argument Refined. An Analysis of the Theory and Practice of Concurrent Currencies, London: The Institute of Economic Affairs.

He, Dong and McCauley, Robert (2012) Eurodollar Banking and Currency Internationalisation, Bank for International Settlements, BIS Quarterly Review June 2012.

Hockett, Robert (2013) 'Bretton Woods 1.0. A Constructive Retrieval for Sustainable Finance', NYU Journal of Legislation and Public Policy 401, pp. 401-483.

Hockett, Robert and Omarova, Saule (2017) 'The Finance Franchise', Cornell Law Review 102, pp. 1143-1218.

Jaeger, Carlo C., Haas, Armin, and Töpfer, Klaus (2013) Sustainability, Finance, and a Proposal from China, Institute for Advanced Sustainability Studies, IASS Working Paper December 2013.

Kaplan, Jacob J. and Schleiminger, Günther (1989) The European Payments Union. Financial Diplomacy in the 1950s, Oxford: Oxford University Press.

Keynes, John M. (1944 [1980]) 'Activities 1940-1944. Shaping the Post-War World. The Clearing Union', in: Moggridge, Donald (ed.) The Collected Writings of John Maynard Keynes, Vol. XXV, London: Macmillan.

Knight, Frank (1921) Risk, Uncertainty, and Profit, Boston: Hart, Schaffner & Marx.

Lysandrou, Photis and Nesvetailova, Anastasia (2015) 'The Role of Shadow Banking Entities in the Financial Crisis. A Disaggregated View', Review of International Political Economy 22 (2), pp. 257-279.

Machlup, Fritz (1968) Remaking the International Monetary System, Baltimore: Johns Hopkins Press.

McDowell, Daniel (2016) Brother, Can you Spare a Billion? The United States, the IMF, and the International Lender of Last Resort, Oxford and New York: Oxford University Press.

Mehrling, Perry (2011) The New Lombard Street. How the Fed Became the Dealer of Last Resort, Princeton and Oxford: Princeton University Press.

Mehrling, Perry (2015a) Why Is Money Difficult?, Barnard College of Columbia University, Blog.

Mehrling, Perry (2015b) 'Elasticity and Discipline in the Global Swap Network', International Journal of Political Economy 44 (4), pp. 311-324.

Mehrling, Perry (2016) 'Beyond Bancor', Challenge 59 (1), pp. 22-34.

Mehrling, Perry (2017) 'Cryptos Fear Credit', The Money View Blog, 29 September 2017.

Minsky, Hyman P. (1986) Stabilizing an Unstable Economy, New Haven and London: Yale University Press.

- Mints, Lloyd W.** (1945) *A History of Banking Theory in Great Britain and the United States*, Chicago: University of Chicago Press.
- Mitchell-Innes, Alfred** (1914) 'The Credit Theory of Money', *The Banking Law Journal* 31 pp. 151-168.
- Mundell, Robert A.** (1972) 'The Future of the International Financial System', in: A. L. Keith Acheson, John F. Chant, and Martin F. J. Prachowny (ed.) *Bretton Woods Revisited*, London: Macmillan, pp. 91-104.
- Murau, Steffen** (2017a) 'Shadow Money and the Public Money Supply. The Impact of the 2007-2009 Financial Crisis on the Monetary System', *Review of International Political Economy* 24 (5), pp. 802-838.
- Murau, Steffen** (2017b) 'The Political Economy of Private Credit Money Accommodation. A Study of Bank Notes, Bank Deposits and Shadow Money', PhD thesis, City, University of London, London, November 2017.
- Murau, Steffen** (2018) 'Offshore Dollar Creation in the post-2008 International Monetary System: Eurodollars, Shadow Money and Central Bank Swaps Lines', Institute for Advanced Sustainability Studies, IASS Discussion Paper, May 2018.
- Neumann, Iver B., Verland, Erik F.** (2004) 'International Relations and Policy Planning: The Method of Perspectivist Scenario Building' *International Studies Perspectives* 5, pp. 258-277.
- Ocampo, José Antonio** (2017) *Resetting the International Monetary (Non)System*, Oxford: Oxford University Press.
- Pozsar, Zoltan et al.** (2012) *Shadow Banking*, Federal Reserve Bank of New York, Staff Report 458.
- Pozsar, Zoltan** (2014) *Shadow Banking. The Money View*, Office of Financial Research, Working Paper.
- Pozsar, Zoltan** (2017) *Excess Reserves and Global Dollar Funding*, Credit Suisse, Global Money Notes #9.
- Prasad, Eswar** (2016) *Gaining Currency: The Rise of the Renminbi*, Oxford: Oxford University Press.
- Rogoff, Kenneth S.** (2016) *The Curse of Cash*, Princeton: Princeton University Press.
- Schacht, Hjalmar** (1949) *Account Settled*, London: George Weidenfeld & Nicolson.
- Schumpeter, Joseph Alois** (1954 [2006]) *History of Economic Analysis*, New York: Oxford University Press.
- Schoemaker, Paul J H.** (1995) 'Scenario Planning. A Tool for Strategic Thinking', *Sloan Management Review* 36 (2), pp. 25-40.
- Stiglitz, Joseph E. et al.** (2009) *Report of the Commission of Experts of the President of the United Nations General Assembly on Reforms of the International Monetary and Financial System*, United Nations, Report September 21, 2009.

Triffin, Robert (1960) *Gold and the Dollar Crisis. The Future of Convertibility*, New Haven: Yale University Press.

Ussher, Leanne J., Haas, Armin, Töpfer, Klaus and Jaeger, Carlo C. (2017) 'Keynes and the International Monetary System. Time for a Tabular Standard?', *The European Journal of the History of Economic Thought*

Uzan, Marc (ed.) (2005) *The Future of the International Monetary System*, Cheltenham and Northampton: Edward Elgar.

Werner, Richard A. (2016) 'A lost century in economics. Three theories of banking and the conclusive evidence', *International Review of Financial Analysis* 46, pp. 361-379.

Yongding, Yu (2014) 'Revisiting the Internationalization of the Yuan', in: Kawai, Lamberte, Morgan (eds) *Reform of the International Monetary System*.

Zhou, Xiaochuan (2009) *Statement on Reforming the International Monetary System*, Council on Foreign Relations, Essential Document, March 23, 2009.

About the Authors

Steffen Murau

Dr. Steffen Murau is a research associate at IASS and a postdoctoral fellow at the Weatherhead Center for International Affairs at Harvard University. He holds a Ph.D. in International Political Economy (IPE) from City, University of London, a Magister Artium in political science, philosophy and international law as well as a B.Sc. in Economics from Ludwigs-Maximilians-Universität München. During his PhD, Steffen taught political economy, international relations and economics at City, University of London, University College London and Columbia University, New York. Steffen has completed internships at Deutsche Bundesbank in Frankfurt am Main and Stiftung Wissenschaft und Politik (German Institute for International and Security Affairs) in Berlin.

ORCID ID: <https://orcid.org/0000-0002-3460-0026>

Joe Rini

Joe Rini is a research associate at IASS. He has a Master in International and Development Economics from Hochschule für Technik und Wirtschaft (HTW) Berlin, and an Honors Bachelor in Economics from the University of Toronto. His work focuses on economic and financial stability. Prior to joining the IASS, Joe spent three years working in the start-up tech sector as a consultant Market Logic Software in Berlin, overseeing the provision of a web-based enterprise management software tool to multinational clients. Joe has also completed internships at the United Nations Conference for Trade and Development (UNCTAD) in Geneva and at Deutsches Institut für Wirtschaftsforschung (DIW) in Berlin.

ORCID ID: <https://orcid.org/0000-0003-0362-7805>

Armin Haas

Dr. Armin Haas is a scientific project leader at the IASS, and leads the research process Integrated Risk Governance of the Global Climate Forum (GCF). At IASS his research focus concerns financial markets and their role for sustaining the economy, the society, and the environment. This includes the stability of the financial system itself, i.e. its resilience towards exogenous shocks and endogenous dynamics, and its potential for financing the real investments needed for the sustainability transition. At GCF, his current research focuses on innovative approaches for the management of large-scale uncertainties. He holds a Ph.D. in economics from the University of Karlsruhe, Germany. Before joining IASS, he worked as senior scientist at the Potsdam Institute for Climate Impact Research (PIK) and headed the research group Bayesian Risk Management.

ORCID ID: <http://orcid.org/0000-0001-6599-2272>



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Institute for Advanced Sustainability Studies e.V. (IASS)

Berliner Strasse 130

14467 Potsdam

Tel: +49 (0) 331-28822-340

Fax: +49 (0) 331-28822-310

Email: media@iass-potsdam.de

www.iass-potsdam.de/en

Contact:

Armin Haas: armin.haas@iass-potsdam.de

ViSdP: Prof. Dr Patrizia Nanz, Managing Scientific Director

Authorized to represent the institute

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