Is the Dollar's Hegemonic Role in the International Monetary System Sustainable?

¿Es sostenible el papel hegemónico del dólar en el sistema monetario internacional?

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Abstract

Since the signing of the Bretton Woods Agreements, the US dollar has formed the central axis of the International Monetary System (IMS). However, is this hegemonic situation sustainable in the medium to long term? This study seeks to answer that question using a prospective approach based on the Complex Adaptive Systems (CASs) underlying Complexity Economics. The greatest danger facing the current IMS as a CAS lies in its endogenous evolution. The modern Triffin dilemma and a tendency towards multipolarity in the economic system –as opposed to the continued unipolarity of the monetary system– make it essential to adapt the system. However, no such adaptation is currently taking place. Thus, with no need for any external shock, the very nature of the IMS leads to an eroding of confidence in the dollar in the medium/long term. In order for the IMS to adapt and reconstruct itself, co-operation between interactive agents participating in the system is essential.

Keywords: International Monetary System; Monetary Unipolarity/Multipolarity; Triffin Dilemma; Complexity Economics; Complex Adaptive Systems.

Resumen

Desde la firma de los acuerdos de Bretton Woods, el dólar ha constituido el eje central del Sistema Monetario Internacional. No obstante, ¿es esta hegemonía sostenible en el medio plazo? Este artículo trata de responder a la pregunta utilizando un enfoque prospectivo basado en los Sistemas Adaptativos Complejos (SAC) de la Economía de la Complejidad. Si se observa el SMI como un SAC el mayor peligro deriva de su evolución endógena. El moderno dilema de Triffin y la tendencia hacia la multipolaridad en el sistema económico – como contraparte de la unipolaridad continuada del sistema monetario – hace necesaria una adaptación del sistema. En cualquier caso, dicha adaptación no se está produciendo. Así, sin necesidad de shocks externos, la propia naturaleza del SMI genera la erosión de la confianza en el dólar en medio y largo plazo. Es esencial la cooperación de los agentes interactivos que participan en el sistema para lograr la adaptación del SMI y su propia reconstrucción.

Palabras clave: Sistema Monetario Internacional; Unipolaridad/multipolaridad monetaria; Dilema de Triffin; Economía de la complejidad; Sistemas adaptativos complejos.

JEL Classification: F31, F33, F37.

1. Introduction

The United States dollar (USD) has clearly been at the centre of the International Monetary System (IMS) since the signing of the Bretton Woods agreements in 1944 led to the dollar acquiring a dominant role. When the first crisis of the dollar as a dominant currency broke out in 1971, the Treasury Secretary of the Nixon Administration, John Connally, addressed European leaders with this famous phrase: "the dollar is our currency, but your problem". Those words are even truer today than they were then, as the message is now aimed not only at Europe but also at countries such as China, Japan and others with close links to the dollar.

But is this dominant situation of the dollar sustainable in the medium/long term within the current IMS? The whole of the current IMS is based on confidence in the dollar and a look forward reveals that two forces are coming to the fore, one in the medium term and the other in the long term, that are having a negative impact on that confidence: in the medium term, the US government will have to decide whether to issue more debt to meet international demand for dollars or to reduce it to improve its fiscal capacity. This conflict of economic interests that arises between short-term domestic and long-term international objectives is called the Triffin dilemma. In the long term, the clear trend towards multipolarity in the economic system may clash with the unipolarity of the monetary system.

This article therefore seeks to provide a prospective approach to the IMS based on Complexity Economics. Current international economic decisions must be established under Knightian uncertainty conditions that are in need of metaheuristic approaches rather than traditional equilibrium models. The IMS is perfectly compatible with the characteristics of Complex Adaptive Systems (CAS) that underpin Complexity Economics, including the presence of disperse and interactive agents, the lack of a global supervisor and ongoing adaptation of the system.

This manuscript contributes to the literature that questions the bases of the current IMS architecture. The practical implications of a possible shift in the current foundations of IMS decision-making are of the utmost importance. Any future change in the role of the USD as the backbone of the IMS would have very serious consequences as the stability and the smooth running of this system depend on international liquidity, sustainable growth of international trade, stability of international capital flows, the orderly correction of the bal-

ance of payment problems of countries and a long list of dollar-dependent factors. It is therefore of vital importance to look to the future from a global perspective and a broad time frame so that the adaptation of the IMS can be proactive, planned, strategic and negotiated by a broad majority of countries to thus foster more balanced, more stable future international relations. By contrast, if the rethinking of the role of the USD is left until the next crisis, as it has been in the past, and action is then taken reactively to circumstances, we may face a real threat to the stability of international relations.

From the start of the dominance of the USD following the Bretton Woods agreements, research into economic systems has fundamentally used general equilibrium economic models, from Walrasian General Equilibrium Theory to Dynamic Stochastic General Equilibrium models. They all coincide in the search for equilibrium, loss of which is always attributed to an external factor. The 2008 crisis taught us that this is not necessarily the case and that the system itself can cause shocks due to its own internal dynamics (Minsky 1986, 2015). Complex Adaptive Systems are associated with out-of-equilibrium dynamics and the underlying framework Complexity Economics offers a previously un-explored opportunity to adopt a prospective approach that can bring a new perspective into some decision-making problems in the international monetary field. This paper therefore addresses the issue from a new perspective capable of encompassing the new challenges of the IMS.

The article is organised as follows. Section two reviews the dominant role of the dollar within the IMS since the Bretton Woods Agreement and provides figures to show the current hegemony of the USD. Section three puts forward Complexity Economics as the methodological basis for the prospective ap-proach. Section four develops the prospective approach in the medium and long terms. Based on this, section five proposes future actions focusing on working on monetary multipolarity proactively and on a cooperative basis. The article ends with the main conclusions.

2. The Dominant Role of the USD in the International Monetary System

Its presence in international trade, its importance on the currency market (Forex), its use on financial markets, the level of reserves in the coffers of Cen-tral Banks and its role as a standard asset for other currencies whose govern-ments have opted to introduce a fixed exchange system are the main aspects taken into account when assessing the influence of each currency (Kenen, 1983; Mazid *et al.*, 2011). The dollar (USD), the euro (EUR), the yen (JPY), the pound sterling (GBP) and the yuan or renminbi (CNY) are at the forefront in that regard. All five have been assessed in a five-year review conducted by the International Monetary Fund (IMF) (2016a) to identify and faithfully reflect the relative importance of the currencies selected for the basket of currencies that make up the special drawing rights (SDR). Those five currencies comprise 93 per cent of world reserves (IMF, 2016b) and 86 per cent of the value of

international payments (SWIFT, 2015); furthermore around 79 per cent of the transactions on the FOREX market (BIS, 2016) are performed through them. In terms of economic importance, the countries that endorse them are responsible for 70.77 per cent of global GDP (World Bank, 2016) and account for around 62 per cent of the world's external debt (CIA, 2014).

However, the USD dominates all essential aspects of the monetary sphere and has thus become the undisputed dominant currency (Figure 1). A radial comparison of these five currencies reveals the real competitive advantage of the dollar and its domination of all aspects of the IMS, far ahead of the euro, its closest competitor.

Figure 1. Representation of the Weights of the Main Currencies with International Status
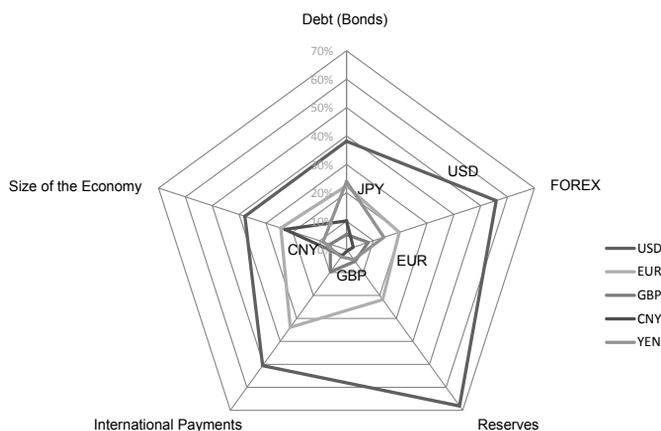
Source: own elaboration based on data from IMF (2016a), World Bank (2016), SWIFT (2015), Triennial BIS Survey 2016 (2016) and DatosMacro (2016)

Note: For a better interpretation of this radial graph, we assume that the five currencies selected add up to 100% of each dimension

The USD currently accounts for 64 per cent of foreign *currency reserves* worldwide, followed by the euro (20.37 per cent), the pound (4.79 per cent), the yen (4.08 per cent) and, lagging far behind, the yuan (0.5 per cent), which is seeking to gain access to central bank reserves (IMF, 2016b). An initial step was taken in October 2016 when the Chinese currency was included in the basket of currencies known as special drawing rights issued by the IMF. 43.27 per cent of *international payments* are made in dollars, 28.63 per cent in euros (though the euro has gradually lost market share since 2012), 9.02 per cent in pounds, 2.88 per cent in yen and 2.45 per cent in yuan (SWIFT, 2015). This

last percentage has grown relatively quickly in recent years and, as Chinese trade is the largest in the world in terms of volume, its trend will be of great interest when determining the international status of the Chinese currency in the future. On the *currency market* (FOREX) 44 per cent of transactions were in USD, according to April 2016 figures submitted by the BIS in September that year. It was followed by the euro (15.5 per cent), the yen (11 per cent), the pound (6.5 per cent) and the yuan (2 per cent).

It should be noted that the US government's *treasury debt* is the largest in the world and it also has the largest number of bonds in circulation, facilitating dollar access for many countries with a trade surplus which wish to invest. The *US economy* is the most robust and the best suited to offering its currency as the backbone of the IMS. Furthermore, we must not overlook other aspects that are more difficult to quantify and in which the USD also excels. Those aspects include the fact that the dollar is the vehicle currency par excellence, that it generates global consensus regarding its use to anchor many fixed exchange rate systems and that key assets are denominated in dollars, with oil being the most important benchmark. Military security arising from geopolitics and not purely economic aspects is precisely why the six countries that make up the Gulf Cooperation Council are so closely linked to the dollar and so loyal to the US in its decisions (Momani, 2008).

However, strategic decisions regarding the international monetary system must not react to the current situation but rather to contingencies that may have to be faced in the future. The following section of this article therefore considers the framework within which not only the analysis of the current situation but also the concept of such future contingencies should be conducted.

3. Prospective Approach of the International Monetary System: Approach From Complexity Economics

As noted in the previous section, the USD is undeniably the backbone of the current IMS. As the whole weight of the monetary system falls on a single country, the associated risks are on a huge scale, so we believe a "prospective approach" to the trend over time in the current design of the IMS structure to be essential. We have coined this term to meet the semantic needs arising from the innovative conceptual framework on which we base our work –Complexity Economics (Arthur *et al.* 1997; Foster and Metcalfe 2001; Colander *et al.*, 2004; World Economic Forum, 2013); we define a *prospective approach* as an approach that seeks to encompass the uncertainty and lack of accuracy of forecasting the future. It is difficult to embark on a prospective approach of this type to the monetary system– which is complex, dynamic and long-term– from a traditional perspective.

Complexity Economics is based on the existence of so-called Complex Adaptive Systems (CAS): they make possible the development of well-defined, yet flexible, models that exhibit emergent behavior. In the words of Holland &

Miller (1991), such models can capture a wide range of economic phenomena precisely, even though the development of a general mathematical theory of complex adaptive systems is still in early stages. These authors remark that a major feature of these models is their ability to produce emergent behavior. That behavior can be expressed by words (which are flexible but often fail to be logically consistent) or by mathematical models (which are too rigid, but have a consistent structure).

CAS are used in very different knowledge areas to explain the behaviour of such different systems as anthills, cities, ecosystems, physiological systems and the Internet. They all have a series of characteristics in common that lead them to behave as an adaptive, complex system. The International Monetary System perfectly matches the fundamental characteristics of a CAS (Arthur *et al.*, 1997, Eidelson, 1997; Rojí-Ferrari, 2005; Holland, 2006; Beinhocker, 2006; Helbing and Kirman, 2013):

- Dispersed interaction: the IMS consists of independent interactive agents in the form of central banks, international organisations such as the IMF and the Bank for International Settlements, institutional investors, private investors and other stakeholders. Those agents interact in a game situation and the decisions of each of them affect the forecasting and decision-making of the others. For example, the volatility of exchange rates increases after the intervention of central banks (Dominguez, 1998), thus showing that despite their independence agents make decisions and react to the decisions of other members of the system.

- Absence of a global supervisor: control is by means of coordination and competition mechanisms involving the agents themselves. Even though the system has regulatory institutions in the economic sphere, there is no central planner.

- Constant adaptation: decisions, actions, behaviour, strategy and policies are reviewed and adapted (as a repeated game) when the interactive agents deem this to be necessary. This is an inherent characteristic of the current financial network (Haldane, 2013). If no such adaptation occurs the endogenous development of the system may lead to near collapse with no need for an external shock.

- Perpetual novelty niches: there are always new opportunities arising from constant innovation in both the monetary and economic systems. The term alludes to new behaviours, but also to new technologies such as so-called *fintech*, which are changing the way in which money is moved around the world (Bruggink, 2016). Niches are continually created by new adaptations (Holland and Miller, 1991).

- Non-equilibrium dynamics: given all the above characteristics, the system does not comply with any optimum point or global equilibrium, although adaptive systems may settle down temporarily at a local optimum (Holland and Miller, 1991).

The factors of Complexity Economics fit into the theoretical framework of Knightian uncertainty of international economic policy. This type of uncertainty, which is difficult to measure, is gaining importance in the constructivist literature of international economic policy exemplified by authors such as Blyth (2002) and Abdelal *et al.* (2010). We refer to ideas such as uncertainty, irrationality and confidence, which are fundamental in profiling the key aspects of the future of the IMS. Hence, this article does not seek an equilibrium model and the rationale is not quantitative assessment; it seeks rather to develop a qualitative approach.

4. Standpoint of the Prospective Approach to the International Monetary System

All Complex Adaptive Systems have a history, evolve and their past is complicit in their present behaviour. Therefore, this article considers the background and current status of the dominant role of the USD so as to provide a basis for the current analysis and the medium- and long-term prospective approach (Figure 2).

Figure 2. A Prospective Approach to the International Monetary System from the Perspective of Complexity Economics
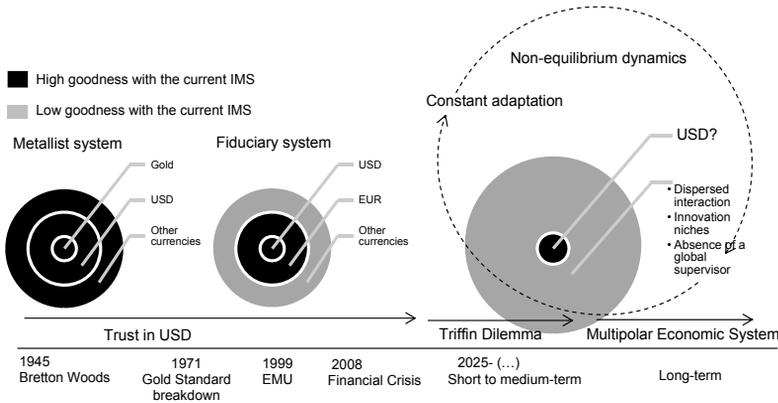
Source: own elaboration

The goodness of the IMS, taken as the suitability of its design in terms of the economic context, has varied significantly since it was set up after the two world wars. Establishing the USD as the anchor of the system at that time benefitted both the US and the rest of the countries: it enabled international economic relations to be restructured in an orderly fashion, guaranteed stability at a difficult time and managed to drive economic growth; the dollar gener-

ated economies of scale and network externalities and gave credibility to the system (Campanella, 2010). However, the goodness of the system has fallen gradually (the black area of the figure indicates a high level of goodness of the IMS, while the grey area shows a low level) as both circumstances and the interactive agents have changed: floating exchange rates, greater complexity and efficiency of financial markets, the appearance of the euro, key creditors in the Asia-Pacific zone and the Persian Gulf, greater relevance of private liquidity provision, etc.

The IMS is currently based on confidence in the USD: the question of confidence has become a key aspect for the future outlook of the IMS, but it is extremely difficult to model. The analysis has to be approached from the perspective of the interactive agents based on the guidelines set by psychology (they have incomplete information, prejudices, commit errors, etc) –as is the case in Complexity Economics–, given that this may be decisive in their policies. When the IMS is analysed as a CAS the modern Triffin dilemma in the medium-term and the trend towards economic multipolarity in the long term emerge as two forces to which the system must necessarily adapt.

4.1. Medium-Term Prospective Approach: Modern Triffin Dilemma

In the medium term the greatest danger facing the IMS lies in the emergence of a new Triffin dilemma, expressed in "modern" terms (Pozsar, 2011; Campanella, 2010; Fahri *et al.*, 2011; Obstfeld, 2011; Zhou, 2009; Otero-Iglesias, 2014). Although this idea enjoys broad academic support, we believe it has been undeservedly sidelined in the international agenda. Robert Triffin first posited the dilemma that bears his name in 1960. The original Triffin dilemma identified the paradox that the US, through the dollar, had to provide sufficient global liquidity to stimulate world economic activity, but in doing so it was harming the credibility of the dollar by removing its capacity to maintain dollar-to-gold convertibility at the established rate of 35 dollars per ounce (Triffin, 1960, 1978). The real economic flows that the analytical construct of the original Triffin dilemma tried to identify and understand pushed the IMS to the edge of collapse, with the dollar only being saved by the cancellation of its convertibility to gold. The US dollar thus came to be the central axis of a fiduciary monetary system, sustained by creditors' confidence in the currency (Wolf, 2010).

The Triffin dilemma cannot be rehashed in its 1960 form, but its contemporary relevance cannot be ignored, according to such leading figures as Zhou Xiaochuan (2009), governor of the People's Bank of China, and Lorenzo Bini Smaghi (2011), a member of the executive board of the European Central Bank. The essential difference from the traditional approach is that the US's creditworthiness, which is responsible for underwriting international liquidity, is now backed by fiscal capacity rather than gold. The key element is the fac-

tor underpinning that confidence –be it gold or fiscal capacity– and much of the original arrangement therefore remains unchanged. Figure 3 shows the concept map of the original and modern Triffin dilemmas.

FIGURE 3. TRIFFIN DILEMMA, THEN AND NOW. ORIGINAL TRIFFIN DILEMMA (1960)
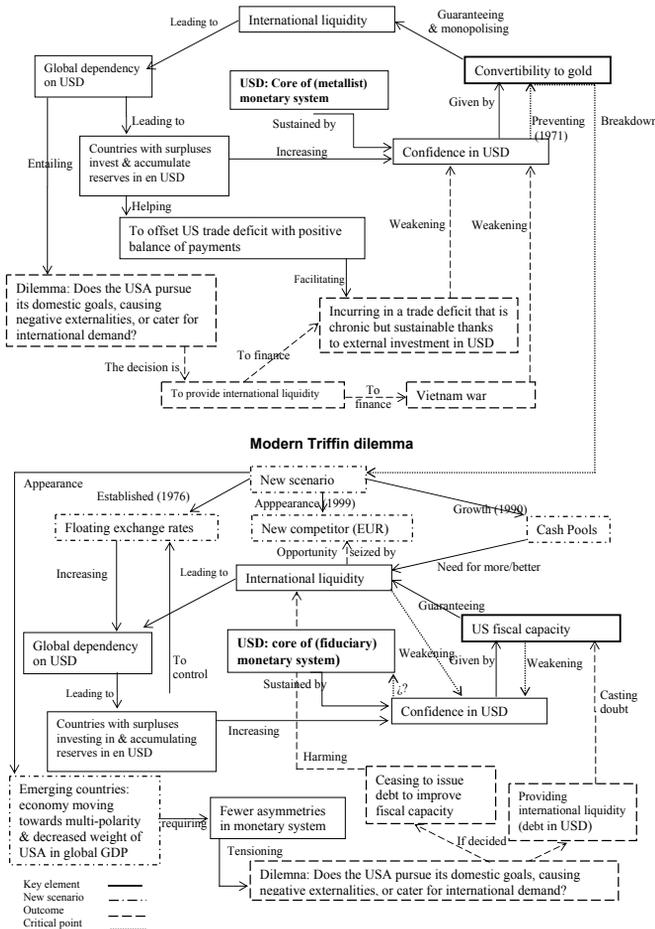
Source: own elaboration

The modern Triffin dilemma is designed for the new scenario that has gradually developed since the establishment of floating exchange rates in 1976. The most significant factors that have necessitated greater confidence in the dollar

are the creation of the euro, the economic expansion of emerging economies since 2000 and the generation of international cash pools. That trust is now backed only by the mutual attitudes of different interactive agents towards American fiscal capacity; with gold removed from the equation the same guarantees are now being required of the dollar. The US is faced with the choice of either issuing more debt to meet global demand for dollars or reducing debt to improve its own fiscal capacity. If the US treasury continues to issue debt at the current rate without achieving solid growth, in the medium to long term US fiscal capacity will no longer be viewed as a guarantee, due to the reduction in the relative weight of the American economy on the world stage and the vast quantity of debt that it seeks to underwrite. However, if it stops issuing debt so as to relieve the burden on its fiscal capacity (that is to say, if it pursues its own domestic goals) it will harm the provision of international liquidity.

Given that fiscal capacity is the cornerstone of all trust in the dollar and bearing in mind that any sign of weakness might be exaggerated on markets by the confidence multiplier effect (Akerlof and Shiller, 2009), the modern Triffin dilemma will lead to a gradual erosion of confidence in the dollar in the medium term (Stiglitz and Greenwald, 2010; Helleiner, 2010; Kirshner, 2014). The extent of that loss of confidence is as relevant as it is uncertain, given that it will condition the action of the interactive agents and vice versa. However, even those authors who are most sceptical about the decline of the dollar, such as Prasad (2014), agree that there will be a falloff in demand for the currency.

Depending on how the *perpetual novelty niches* that tend to occur in CAS evolve, an entirely different situation might arise: on the one hand, the collapse of the IMS might be accelerated due to an increase in financial interconnectivity, the ever greater importance of non-bank institutions, an increase in the frequency, amplitude and duration of financial cycles and greater volatility of capital flows through a less and less controllable systemic risk. On the other hand, however, the situation might improve due to possible future novelty niches: the supply of international liquidity might not necessarily require an accumulation of current account deficits by the US, provided the FED is capable of offering secure short-term reserve assets and of investing in other less liquid ones securely using financial engineering (Mateos and Lago *et al.*, 2009). *Perpetual novelty niches* can condition the changes over time in the system itself or, as in the case above, can simply act as a safety valve, alleviating occasional imbalances caused by part of the debt issued. However, in no case can they be the definitive solution to the Triffin dilemma.

Thus, the IMS does not require an external shock of the type typical of balance of payments models to suffer a collapse. As a CAS, its own endogenous evolution will suffice: the very nature of the IMS means that either option –prioritising the provision of international liquidity or prioritising improved fiscal capacity– will erode confidence in the dollar. As Otero-Iglesias (2014) argues, the present IMS is prone to crisis, not so much because of potential external shocks –which is precisely the area on which IMS interactive agents and academics and experts in the field tend to focus– but because of its own endogenous evolution.

Despite the pressure exerted by the endogenous evolution of the system in the form of the Triffin dilemma, in the medium-term future the dollar's *incumbency status* (Eichengreen, 2011) will serve to maintain its position as the central axis of the IMS.

4.2. Long-Term Prospective Approach: Unipolar Monetary System Versus Multipolar Economic System

In the long term, developments in the relative economic and financial importance of different interactive agents on the international stage will heighten the endogenous evolution of the IMS: ever-greater tensions between an unipolar IMS and an increasingly multipolar economic system will intensify the Triffin dilemma (Eichengreen, 2011). In this way, the mere passage of time will help to weaken dollar incumbency.

America's share in the world economy is declining in relative –though not absolute– terms, but its currency continues to occupy the central position in the IMS (Bénassy-Quéré *et al.*, 2011; Eichengreen, 2011; Otero-Iglesias, 2014). The global economic system is evolving towards multipolarity (IMF, 2016c), defined by the World Bank (2011) as "the existence of more than two growth poles in the world economy, measured as the degree of concentration of growth polarity (the lower the concentration, the greater the degree of multipolarity". Figure 4 shows the current imbalance between the relative economic and monetary dimensions of the US, the European Monetary Union and the People's Republic of China.

Figure 4. Monetary Unipolarity Vs Economic Multipolarity
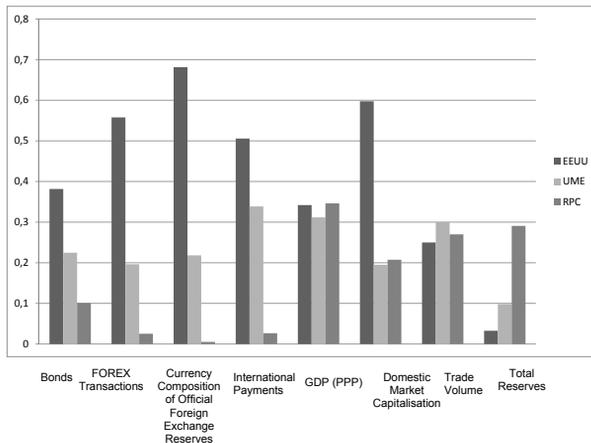
Source: own elaboration based on data from World Bank (2016), Eurostat (2014) and IMF (2016d)

According to the World Bank's multipolarity index (2011) the world is now more multipolar than at any time since 1968, and the trend is set to increase in the decades ahead. In general, growth in western economies has slowed, making room for other countries to play an ever greater role in the world economy: the emerging countries have now "emerged". The World Bank (WB) considers that by 2025 the six largest emerging economies (Brazil, China, India, Indonesia, South Korea and Russia) will account for over half of the world's economic growth activity. In a later report, the World Bank (2013) has published forecasts based on two scenarios: in the event of a gradual convergence in the level of wealth of emerging countries and the west, the contribution of emerging countries to global growth is expected to rise from 73 per cent in 2015 to nearly 87 per cent in 2030. In a less conservative scenario, they may account for 93 per cent of global growth.

Economic multipolarity translates into a long-term structural development in markets; emerging countries –which hold three quarters of official currency reserves– will become key interactive agents on financial markets (World Bank, 2011). When the weight of the interactive agents varies in a CAS the system adapts to reflect their interests, depending on their relative weight. Such an adaptation would force the unipolar IMS to follow in the footsteps of the multipolar economic system (Eichengreen, 2011; Bini Smaghi, 2011). In a clear sign that this process has already begun, the BRICS have called for a renegotiation of the dollar's status as the anchor of the global economy (Helleiner, 2008). The unilateral creation of the New Development Bank (NDB) is another sign of this adaptation. However, the initiative is driven only by interactive agents that are under-represented on key institutions such as the WB and the IMF and not by all agents. Once again, according to Complexity Economics, the dynamics of the system may lead to a situation of instability or even collapse with no need for any external shock if the system has not been adapted in its entirety, respecting the weight of each interactive agent.

5. Proposal for the Future: To Focus on Monetary Multipolarity Proactively and Cooperatively

If the IMS's natural tendency as a CAS is to follow international economic and financial relations and this leads it in the direction of multipolarity, then surely it is better to take this path in an orderly fashion, without waiting for conflict. Complexity Economics allows only one way for the IMS to adapt and reconstruct itself: in the absence of a global authority it is essential to promote co-operation in order to build sustainable relations between interactive agents.

To cooperate, however, it is first necessary to address the mechanisms of cooperation. It is extremely difficult to reach decisions by consensus (Nash equilibrium) when the institutions created for that purpose do not properly reflect the relative economic and financial weights of the interactive agents, resulting in an imbalance in decision-making power (Güven, 2017). In order to

relieve tensions between the economic and monetary systems, and to propose policies and incentives for cooperation that will encourage external stability, it is essential to give greater representation to those countries whose economic weight has increased notably while their decision-making power has remained static. In decision-making on IMF policies, the G7 holds 41.33 per cent of the votes but the five countries that make up the BRICS block hold only 14.18 per cent (IMF, 2017). Given that the G7 (and primarily the US) is the main benefi- ciary of the current IMS, it seems inevitable that nearly half of the body would vote down any reform that seeks to set the IMS on the road to multipolarity. Even efforts by the G7 to reform the IMS, such as France's attempt during its G20 presidency in 2011, have been rejected by the US. This situation may have been acceptable in the mid-twentieth century, but it no longer reflects the real position of the interactive agents involved and it hampers the continuous, organic adaptation to new economic and financial conditions that any CAS requires.

Despite the fact that the US, as an interactive agent in the system, has a guaranteed short-term military and geo-political hegemony (Drezner, 2010; Eichengreen, 2011) which enables it to maintain its opposition to possible changes in the IMS and to proper representation of countries in institutions such as the IMF and the WB, it is actually in the best interests of the US to work in cooperation. It is certainly true that in the current circumstances the US is the main beneficiary of the IMS. However, these circumstances are unlikely to hold in the medium to long term. That being so, it is in the US's own interest to focus on reappraising the current system in an ordered and planned fashion, thus enabling it to continue occupying a predominant position; in contrast, if confidence in the dollar were to be lost in some currently unpredictable crisis the US might lose its status altogether.

Even if the US chooses not to co-operate, despite its political weight and its over-representation on the main institutions, the IMS must, like any CAS, in- evitably adapt. In the long term, it might achieve multipolarity through further financial market development, capital account liberalisation and exchange rate flexibility in EMEs (Bini Smaghi, 2011). The only difference is that adaptation without cooperation will take longer and will produce conflicts between inter- active agents that could lead to instability in the system.

A number of roadmaps for monetary multipolarity have been advanced. However, there are great difficulties in getting them onto the international agenda, essentially because of underlying stumbling-blocks to cooperation. Proposals range from some with low levels of structural importance –for exam- ple the creation of stability mechanisms such as a global liquidity guarantee network– to the use of SDRs in a modest or ambitious role. Other proposals for the medium term include a competitive multi-currency system revolving around the dollar, the euro and the yuan and the creation of regional monetary blocks. In the long term, the possibility of ascribing a more active role to SDRs and giving them a central role is also being considered, as is a global currency,

the introduction of which would entirely defuse the Triffin dilemma[1]. However, not even the least ambitious of these initiatives has prospered. Nonetheless, a CAS, such as the IMS cannot be strapped down in the long term, even if it can be slowed down by a single interactive agent. Without a focus on the road of cooperation, the action of the other interactive agents –primarily the emerging countries– will establish the path to the future, more slowly but inevitably.

Our purpose here is not to assess the best paths for adapting the IMS as a CAS but to stress the need to focus on that adaptation. The best path will be the one that emerges from cooperation based on "fair representation of countries" as interactive agents and grounded in a long term perspective rather than short-term interests (Boorman and Icard, 2011).

6. Conclusions

Despite the dollar's undisputed hegemony and although it still makes sense to invest primarily in it and trust in its security, Complexity Economics indicates that as things currently stand the IMS is prone to crisis. This corroborates the intuitive unease expressed by several experts (Zhou, 2009; Bénassy-Quéré *et al.*, 2011; Boorman and Icard, 2011; Farhi *et al.*, 2011; Eichengreen, 2011; Otero-Iglesias, 2014).

Previous literature has used general equilibrium economic models to examine issues related to the IMS. However, the Knightian uncertainty intrinsic to international economic relations makes it necessary to develop other approaches on which to base decision-making in this area. This study proposes a new framework based on Complexity Economics which enables a prospective examination to be made of the IMS as a Complex Adaptative System, that is a system characterised by different agents interacting in dispersed fashion which mutually condition each other, with no global overseer and with perpetual novelty niches that force constant adaptation with little likelihood of achieving a balanced dynamic. This new framework makes it possible to analyse the risks inherent in the endogenous evolution of the IMS rather than focusing on external shocks as a cause of instability and crisis, as has commonly been done in the traditional economy.

As a result of the action of the so-called interactive agents within the IMS, a trend towards two clear dynamics can be seen, one in the medium term and another in the long term, both of which lead to a decline in importance of the dollar. In the medium term a trend can be observed towards instability of the IMS arising from its own endogenous evolution, in the form of a modern Triffin dilemma –the incompatibility of fulfilling US national objectives while meeting the demands of international liquidity–. On the basis of Complexity Econom-

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[1] See Mundell (2005), Zhou (2009), Stiglitz et al. (2010), Otero-Iglesias (2010), Campanella (2010), Stiglitz (2011), Farhi et al. (2011), Obstfeld (2011), Bénassy-Quéré et al. (2011) for a review of the different alternatives.

ics, it can be concluded that the nature of the IMS as a CAS will eventually lead to an erosion of the confidence of interactive agents in the dollar in both options, with no need for any external shock. In the long-term, the endogenous factors of instability will be augmented by a clear move towards economic multipolarity, in opposition to the monetary unipolarity of the dollar. As a CAS, the IMS will necessarily have to adapt to these new circumstances.

The principal problem in the IMS as it stands at present is the difficulty that it faces in fulfilling the *constant adaptation* essential for any CAS. Histori-cally, the US has been the main interactive agent in the IMS because its eco-nomic, political and military superiority have conditioned all relations within the system. In any CAS, the action of each interactive agent conditions the actions of others, but in the case of the IMS a single interactive agent is holding back the necessary adaptation of the system to new circumstances through its "veto" power. The lack of a global supervisor, another essential feature of CASs, means that this situation of non-adaptation could be sustained in the medium term due to the incumbency of the dollar and the superiority of the US as an interactive agent, aided by the US's voting strength on key institutions. In the long term, however, Complexity Economics predicts that more *perpetual nov-elty niches* will emerge, opening up new possibilities and new economic condi-tions that other interactive agents will capitalise on, diminishing the US's cen-tral role. Thus the greatest danger facing the IMS arises not from any potential external shock but from its own endogenous evolution, and it is on this aspect that both the interactive agents in the system and researchers and scholars should focus their attention.

Complexity Economics holds out only one path for the IMS to adapt and reconstruct itself: promoting co-operation between interactive agents for the construction of sustainable relations. That will first require working towards fair representation of the interactive agents on the institutions in which that coop-eration is designed to take place, such as the IMF and the WB. Even if the main interactive agent, the US, were to decide not to co-operate, the adaptation of any CAS is inevitable. The only difference is that adaptation without coopera-tion will take longer and will produce conflicts between interactive agents that could lead to instability in the system. In that case, surely it is better to take this path in an orderly fashion, without waiting for conflict to arise.

The IMS should be designed not out of inertia but in response to the chal-lenges that will have to be faced in the future. This study addresses those challenges using a new methodology that enables a comprehensive, long-term prospective approach to be taken. The future remains unwritten; it can be built by making the right decisions at the right time. And the right time is when all options are still available, including the best one. That is still the case today, but if decisions are taken reactively and not proactively the next time a crisis unfolds around the dollar, not all options may still be viable.

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