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Innovation ecosystems in banking and monetary sector: competitiveness versus sustainabilityⁱ

*Ecosistemas de innovación en el sector de la banca y moneda: competitividad
versus sostenibilidad*

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ABSTRACT

This paper addresses the innovation ecosystems configuration of the banking and monetary sector, checking its innovation orientation for competitiveness and sustainability. To achieve this objective, the actors' perspective from the reframed Innovation Helix is applied. The main result is that the Banking and monetary authorities are rather centred on short-term system stability, which at the longer term can be counterproductive in terms of sustainability. Industry is mainly centred on competitiveness however increasingly taking into account the 'green transition'. The society, academia and natural environment visions are strongly focused on sustainability. Currency innovations are envisaged at all the levels, bringing different proposals which can be complementary and that bring the potential of more bottom-up initiatives, collaboration and sustainability in socioecological dimension. Metamodern prospect enriches the standpoint, especially in societal and individual aspect of 'daring to know' which this document tries to boost.

Key words: Innovation, banking and monetary innovation, innovation helix, sustainability, sustainable innovation.

JEL Code: G15, G18, G21



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RESUMEN

Este documento aborda la configuración de ecosistemas de innovación del sector de la banca y moneda, verificando su orientación de innovación en términos de la competitividad y la sostenibilidad. Para lograr este objetivo, se aplica la perspectiva de los actores desde la Hélice de Innovación reformulada. El resultado principal es que las autoridades bancarias y monetarias están principalmente centradas en la estabilidad del sistema a corto plazo, que puede ser contraproducente a largo plazo en términos de sostenibilidad. La industria está orientada principalmente hacia la competitividad, aunque cada vez se tiene más en cuenta la ‘transición ecológica’. Las visiones desde la sociedad, academia y el medio ambiente se enfocan con fuerza en la sostenibilidad. Las innovaciones en moneda traen diferentes propuestas que pueden ser complementarias y que brindan el potencial de más iniciativas desde abajo, la colaboración y sostenibilidad en términos socioecológicos. El prospecto metamoderno enriquece el punto de vista, especialmente en cuanto al atrevimiento a saber, que este artículo intenta potenciar.

Palabras clave: innovación, innovación del sector de la banca y moneda, ecosistemas de innovación, hélice de innovación, sostenibilidad, innovación sostenible.

Código JEL: G15, G18, G21

INTRODUCTION

The present document is a further stage of the research presented in the documents establishing the framework for structural maturity advancement assessment of innovation ecosystems in the EU (González, Kubus & Mascareñas, 2018) and based on that the banking sector case study (Kubus, 2019), it touches also the document about the Horizon Europe, actors' perspective in the innovation ecosystem (González, Kunus, & Mascareñas, 2019). It takes the outcome of the previous researches, notably the one of the banking sector, developing the monetary and different currencies aspect to apply there the competitiveness and sustainability frames of reference, as the innovation is pivotal for both processes. It also amplifies the innovations area, for instance, on the banking sector 'green transition' readiness.

The purpose of this research is the analysis of the collective intelligence conditions through a comprehensive depiction of recent trends in the banking innovation, especially in terms of different currencies options, seen from different angles. The postmodern prospect brought the tunnel vision to academic studies. This work aims to overcome this division, joining different contexts and in this way providing for collective intelligence learning loops application (Mulgan, 2018).

From the innovation ecosystems context, it takes a biological framework of an ecosystem as opposed to usually applied reductionist physical and mathematical mirroring composition of economic and socioecological reality. Only when there is a first loop collective intelligence learning and understanding of the underlying model of the reality and its configuration, this model can be challenged, in the second loop defining variables that can be modified and in the third loop, the thorough way of thinking about the subject can be re-approached differently.

In this qualitative systemic framework analysis of the banking sector, the refraction through the innovation ecosystem actors' perspective allows for a new and structured understanding, also channelling a balanced metamodern super-hybridity¹ applied to economic and socioecological practice. Super-hybridity is understood here as 'a method of responding to, or exploiting, the technological accelerated possibility of converging sources and influences'(Van den Akker, Gibbons, & Vermeulen, 2017).

¹ However, first mainly applied to the artistic (and cultural) practice: <https://frieze.com/article/pick-mix>

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Specifically, from the theoretical framework context, the model of the ecosystem is based on the actors' approach, but it implies also the innovation process outlook. Actors' perspective is founded on the reframed triple helix (Etzkowitz 2008; Lowe, 1982; Leydesdorff, 2012), grounded on the Sabato triangle of knowledge (Sábato & Botana, 1968).

In the previously mentioned background study of the innovation ecosystem framework, i.e. innovation helix (González, Kubus, & Mascareñas, 2018), two additional dimensions were added to this picture: society and natural environment. These actors interplay defines the ground for the innovation, in this sense, they are required to interact, compete and collaborate together (González & Martin, 2013). In this way, the collective intelligence can emerge, but orchestration is a key. It can allow a proper and comprehensive response to threats and organisation of tactic and strategic priorities, regarding attention, action and resources allocation.

The innovation process context apart from the implied actors' evolution (Cai, 2015; Carayannis, Campbell & Rehman, 2016) out of the scope of this document, brings on the multilevel perspective with its innovation phases and levels (Geels, 2010), before all else when it comes to window of opportunity for the innovation break-through. This research of the banking sector is not exclusively concerned with the EU level governance. On the one hand, the EU is only one of the players on the international scene and here the global picture is studied; on the other hand the future EU main Research and Innovation (R&I) framework program – Horizon Europe, does not take innovation in the banking sector as an area of relevance for innovation emergence (González, Kubus & Mascareñas, 2019).

In the conceptual part, in order to build the understanding background, the overview of the global banking and monetary architecture will be presented, the money, credit and their characteristics are briefly revisited, followed by the traditional fiat money geopolitics introduction.

The actors' revision starts with the banking authorities, where the liquidity trap and unconventional monetary policies, the diabolic loops in the sovereign nexus issue and the central banks digital currency innovations are reviewed. Traditional banking sector innovation standpoint provides with general approach, after that Fintech characterisation, and digital currencies, blockchain and smart contracts problematics introduction, with the the private banks currencies issuance proposals to complement the picture.

Academia's views include 'operational realities' studies such as Modern Monetary Theory proposal or the money issuance question with the positive money innovation status check. Society is characterised by three perspectives, the one of the inequalities associated to the capital dynamics, the alternative, bottom-up currencies and finally the metamodern prospect

at the level of sociotechnical landscape. The natural environment is seen from the angle of green transition of the banks and natural environment related currency proposals.

Developing countries context is even more out of the scope of the present document, their specificity would require a separate study, for instance in terms of financial inclusion and/or microcredits, even if they could also apply to some sectors of the developed countries, in sense of *Ungleichzeitigkeit* defined in 1932 (Bloch, 1992) or different, asynchronous progress levels inside the same civilization or country.

The metamodern definition of challenges faced by our societies² can provide also an inspiring lens for examination. Hereby the concepts are going to be applied when they are eminently relevant and can bring a structural understanding to the subject, in other conditions seen with a phenomena fragmentary understanding.

In principle, the density and emergence of intermediary institutions are important indicators for the structural advancement of an innovation ecosystem, also their multilateral nature when it comes to innovation actors' implication. This could be an interesting line of future studies. Hereby only basic architecture configuration is presented.

Banking sector is considered the infrastructure for other activities, especially economic ones. In this sense, it is probably seen as a part of operating system, so pervasive, that it is difficult to be questioned, corresponding to the metamodern 'structure of feelings' (Van den Akker, Gibbons, & Vermeulen, 2017). This is why it is crucial to approach globally the sector and 'dare to know'.

METHODOLOGICAL AND CONCEPTUAL FRAMEWORK

With the aim of providing the methodological background, the innovation ecosystems conceptual framework is to be explained more extensively, as well as the introduction into the understanding of banking and monetary infrastructure, and the money or currency as a constitutive tool allowing the flow of value exchange in the economy and society.

Innovation ecosystems methodological framework

In order to reach to check the competitiveness versus sustainability approach, the reframed innovation helix is applied. It can be seen in the Figure 1 below. The actors such as Government, Academia and Industry, correspond to the regulatory, knowledge and productive functions of society.

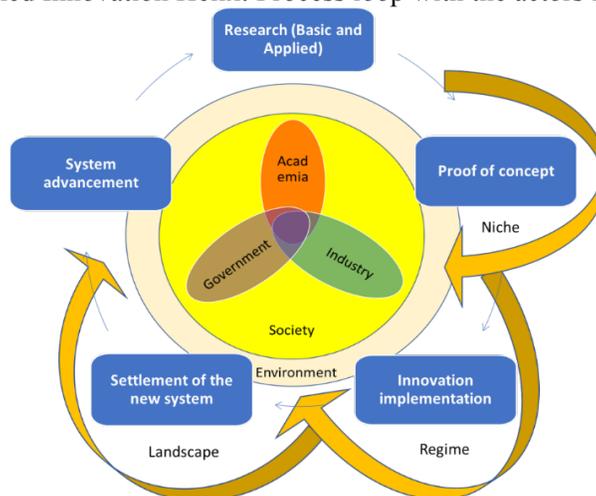
² <https://medium.com/the-abs-tract-organization/the-metamodern-condition-1e1d04a13c4> (Last consultation on October 27th, 2019).

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Additional dimensions are included due to a new and more active role of the society, in the technological and digital environment, and more markedly natural environment as a relevant and all-embracing aspect of the global challenges we face these days.

This is also related to the notion of ‘Anthropocene’³, not only in sense of a geologically defined human epoch but specifically understood as an era when the humanity impact on the Planet Earth ecology (anthropogenic climate change) is not only acknowledged but also there is a sense of urgency in addressing it, at least at the society level.

Figure 1
Reframed Innovation Helix: Process loop with the actors involved



Source: González, Kubus & Mascareñas (2018).

The multilevel perspective (Geels, 2010) gives the vision of three levels, starting from a divergent niche where new ideas are born and incubated, going through the sociotechnical regimes, where they can be scaled-up and finally impacting the sociotechnical landscape, i.e. mindset. This outlook is especially important from the socioeconomically and ecologically disruptive innovation emergence and breakthrough context, living the window of opportunity for challenging the established status quo generally galvanized at the sociotechnical regime level, when the landscape urgency is not transmitted correctly.

From the actors' perspective, however, the grid-group culture theory (Weber, 1978) can bring interesting insides. It provides with four angles regarding the search of solutions and innovations that would be required to address them:

- The individualist outlook interprets the world through the lens of interests and incentives - this could be a main but not only focal point for Industry and Academia.

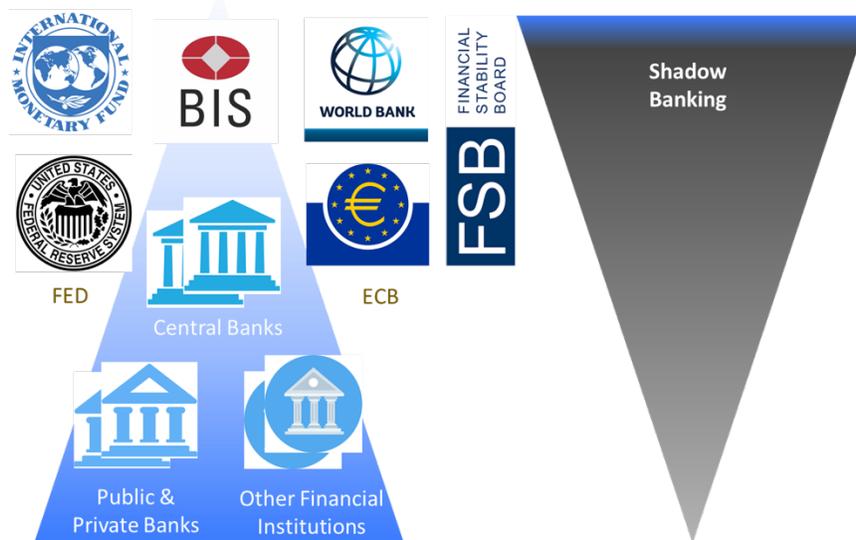
³ See for instance: <http://www.anthropocene.info> (Last consultation on October 27th, 2019).

- The hierarchical context implies conflicting powers, principally for government, hereby represented by banking and monetary authorities and also on the international stage, between different countries.
- The egalitarian panorama is seen through the self-organization of people, and it is especially relevant in case of society. The biological ecosystems and the market can also be seen through this frame of reference.
- Fatalist group can probably be seen in different dissident points of view, if prevailing this can lead to the countries with authoritarian system.

General banking and monetary structure

In order to characterize international financial architecture, three groups of organizations (Silva do Carmo & Simões, 2018) can be distinguished, according to the regulation and supervision dimensions. The first one, are the organizations that exercise these functions. In the second, we have those that are regulated and supervised by the former (as private and commercial banks and other supervised financial institutions), and in the third one, we find the organizations that do not follow such rules or supervision, forming the so-called shadow banking system.

Figure 2
Banking and monetary structure



Source: Own elaboration.

The general banking and monetary structure is depicted in the Figure 2 below. It includes at the international level the Bretton Woods organizations as World Bank and International Monetary Fund thought to help the development of the countries. Bank for International Settlements (BIS) is an independent international entity which can be considered the central bank of central banks (generally national ones), it is based in Switzerland where also the

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Basel I, II and III regulations were originated. Financial Stability Board is a G-20 organization, descending from Financial Stability Forum, with the aim of helping to address the vulnerabilities of global financial system.

Also, European Central Bank and Federal Reserve System are presented: ECB due to the importance of the subject of the European Union to the study of the innovation ecosystems in the EU, that this document is part of; FED because of its significance for the global architecture and the role of USD in the global economy. In the level below, there are central banks of different countries, understood as the ‘lenders of last resort’ and ‘guarantors of value’ with inflation tackling as objective. Afterwards, we have public and private banks and other financial institutions, many of which are transnational but are subordinated to the rules of the levels above.

Shadow banking, a concept coined by Paul McCulley, refers to the companies running financing and credit business activities but that are not in the field of traditional regulations. After the 2008 crisis they are seen as a long-term systemic menace to the stability of the banking system- At the EU or FSB level a monitoring reports and studies are being produced for this sector.

The shadow banking includes different types of companies⁴ operating on the M4 money supply level (notion explained in the following subpoint): investment funds, hedge funds, venture capital funds, monetary market funds (FFM), structural investment funds, borrowing between big corporations, asset-backed commercial papers, collateralized debt obligations, loans securitizations (two last known due to the subprime crisis) or real estate investment trusts (related to real estate bubbles). As in the case of M4 worrying is their scale, some estimations (FSB) say they suppose 120% of world GDP.

Money and credit understanding

Banking sector is the one holding the money which are the principal mean of exchange (Smith, 1776), but also the common denominator of value and its storage (Fetter, 1904). Acceptability is another key characteristic of money. There are also different kinds of money: commodity money has its intrinsic value, for example, gold; fiat currency value is based on some authority backing it, in general state. Cryptocurrency or different kind of currencies raised in the digital environment are in principle based on their ‘general’ acceptability, backed by some algorithms, also companies value, for instance in case of ICO – Initial Coins Offerings.

⁴ <https://www.elsaltodiario.com/banca/todo-hay-que-saber-sobre-banca-sombra-shadow-banking#> (Last consultation on November 4th, 2019).

A significant subject in terms of money is the money supply, or the ‘total quantity of money in the economy at any time’, the M1 being the narrower definition linked strictly to ‘real economy’ and M4 the widest one, including financial markets and their diverse instruments based on the expectations and thus rather implicitly speculation-prone. Currently it is estimated that the ‘real economy’ money (M1-M3) supposes only 2-5% of general money supply. An important concept in the banking sector is the question of credit, which should mobilise capital and make from banking sector a bookkeeping centre of economy and thus society accountant (Laughlin, 1919). However, from some way of looking, this can be also a problem, when causing the money creation along the crediting process (Werner, 2014).

Fiat currencies geopolitics

From the geopolitical perspective, the leading and truly global fiat currency is the US dollar (USD or \$), used in Foreign Exchange (FX), known also as greenback, accompanied by the Japanese Yen (JPY or ¥) and quite recently by the European Union Euro (EUR or €) with its position rooted in the replaced Deutsche Mark (DM).

Altogether they are called Big Three. Also, the Chinese Renminbi (RMB or Chinese Yuan CN¥, CNY or redback) enters in 2015 the international stage and the FMI currency basket, i.e. special drawing rights (SDR or XDR), in theory used for minimising the risk of currency fluctuations. For SDR, created in 1969 the challenge is its definition as money or credit, i.e. form of debt. Even if aiming at aiding USD its current role is considered irrelevant.

USD prevalence (Cohen, 2003) materialises mainly through seigniorage (difference between the real cost of money vehicles and their value) or in some sense interest-free loan from abroad. Flexibility of macroeconomic policy unrelating the balance of payments consideration in domestic policy formulation is another gain, together with the ‘soft power’ of status and prestige with their reflection on market predominance. It goes hand in hand with ‘hard power’ of monetary dependence and potential for economic coercion.

DISCUSSION AND RESULTS

Hereby different dimensions of the banking sector are being reviewed, following the proposed framework of actors’ perspective: banking and monetary authorities (government), banking sector, scholars view (academia), and societal and natural environments outlooks and impacts.

Banking and monetary authorities’ policies innovation

Last financial crisis of 2008 obliged many to rethink the banking system functioning. Monetary policy, however, was centred on relatively traditional methods, the maintenance

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of low interest rates, lowering the interest rates by the central banks. In theory, it should stimulate the borrowers to borrow more (because the credit is cheap) and savers to spend (because they are not gaining money on the deposits and what is more must pay for their maintenance), at the end leading to the investment and stimulation of the economy.

Nonetheless, the real effects result to be somewhat contrary to the expected ones. Banks' profits meagre and they are struggling to cover their cost of capital, firstly because banks main source of profit apart from commissions is the interest rate differential, secondly banks are also obliged to pay for the maintenance of increased mandatory reserves. Furthermore, the investment seems to 'keep dying companies on life support and fuels a potentially unsustainable surge in asset prices'⁵.

Currently entering world stage regulations such as MIFID II or Basel III or IV, are in principle helping the stability. However, regulatory landscape is rather 'balkanised', in part due to arbitrage, i.e. different progress of regulations implementation. Disintermediation, standardization (partly due to regulation and related commodification of banking services), require scale for survival, thus implying defensive mergers which at the end concentrates banking sector even more. Current political situation in the world arena is worrying, authoritarianism is expanding. In part, this can be caused by digitalization of the society and social networks influence where the moderation is replaced with the polarization, sensationalism and tribalism, leading to a post-truth era of irrational political decisions.

The evaluations of risks thus, need the enlargement, above all for cases of protectionism return or retreat from globalization. The operational model of international banks requires adjustments such as subsidiarization, which demands much more investment aiming at the establishment of independently capitalised and governed subsidiaries, instead of branches (BGLN, 2018). Thought for not 'bringing the crisis' to a host country, it has the inconvenience of the parent company implication. Consequently, it is rather reinforcing the local, country competitiveness instead of taking into account collaboration and sustainability.

Liquidity trap and unconventional monetary policies

Liquidity trap is where the interest rate is near zero and the economy is near recession. These are also the conditions where unconventional monetary policies are applied. Once subsequently lowered the interest rates, the policy adopted by the central banks centred in the quantitative easing, i.e. when central banks buy the government bonds and other financial assets in order to directly insert liquidity in the economy.

⁵ <https://www.truthdig.com/articles/bankers-will-stop-at-nothing-to-keep-their-grip-on-the-global-economy/>
(Last consultation on November 4th, 2019).

An alternative sometimes proposed to that is the ‘helicopter money’ - notion coined by Milton Friedman (1969) to illustrate the effects of money expansion policies centred on the banks giving the money to the individuals, or private sector financed with base money, without directly involving fiscal authorities. Theoretically, it would in principle help avoiding deflation. This is related to alternative policies such as citizen’s dividend⁶ (in Georgist economics terms it is a form of regular basic income from leasing or taxing the monopoly of land and natural resources, in original also wealth transfer) or future seigniorage (inflation tax).

Sovereign nexus issue

Sovereign nexus question understood as a nexus between the banking sector crisis and sovereign debt funding problem was raised and studied after the 2008 crisis. It was before all else relevant for the periphery of Euro area, explained by two diabolic loops (Brunnermeier, 2009).

The creditworthiness of the sovereign debt reduced the market value of the banks which in turn are holders of sovereign debt. This affected the perceived solvency of the bank and influenced their credit activity, furthermore, causing the bailout pressure on the government, reinforcing the sovereign distress even further (bailout loop). The credit crunch in the longer term brings lower tax revenue, and perturbed government solvency (real economy loop). More integrated functioning of the EU in this case, consequently, should prevent irrational vagaries of euphoria and tears, i.e. budgetary and fiscal union. Collective bones are a short-term solution.

Central Bank Digital Currency

The use of cash is diminishing. It means that in digital environment, the means of payments are issued and controlled by private agents. Apart from increasing competition by introducing new actors to strongly concentrated payment services, it would provide more stability and trust in monetary system, notably in times of crisis, thus it would mean more sustainability.

In case of Swedish e-krona⁷ project there are separate however related options of account-based e-krona, by allowing the public to have the accounts directly in central bank or value-based e-krona on a card or an app. China’s National Bank is also stating the plans for introduction of its own digital currency as well as Switzerland. There are also proposals for the issuance of an international digital currency backed by multiple national currencies. It raises the doubts about the issuer agency and the rules for obtaining the reserves, also of how

⁶ Similar concept already known from Classical Athens’ history, proposed by Aristides.

⁷ <https://www.riksbank.se/en-gb/payments--cash/e-krona/e-krona-reports/e-krona-project-report-2/> (Last consultation on November 4th, 2019).

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much the central banks are really ‘public’ and if the technocrats leading these institutions are a good option for democratic governance.

Banking sector innovation standpoint

The perspective of the innovation in the banking sector includes in the first place the view on the innovation of the traditional banking and financial institutions. Afterwards, the emerging fintech sector is briefly presented. In the third place, the digital currency, together with blockchain and associated smart contracts emerging technologies are introduced.

Traditional banking and financial institutions innovation

Banks are very much concentrated on their approach to customer, offering omnichannel, more seamless ‘customer journey’ for the products they offer. From the implying technology hardware background, cloud services can be seen as a reason for sustainability as the processing power, as they can be used more efficiently (on demand, according to needs). However, (cyber) security issues can be raised, together with the availability problems. Edge computing is also a complementing countertendency of this approach.

Modular IT architecture is another way of struggle for efficiency in this sector, highly difficult to be achieved, bearing in mind the current banking systems legacy problems. Big data and advanced analytics, including Artificial Intelligence, with Machine or Deep Learning if not properly assessed bring the tendency of reinforcing the past negative tendencies, such as gender or wealth inequality, etc. They should be prepared for auditing, so that their proper functioning could be properly monitored by regulators (Kubus, 2019). Open Banking is being introduced allowed by PSD2 through APIs (Application Programming Interfaces) and in this way paving the way for the Fintech companies. Already mentioned, cybercrime risk mitigation is another important question which in principle requires collaboration of several actors.

Fintechs

The start-ups mantra of ‘run fast and break things’ is at odds with the banking sector operational modes. Furthermore, many Fintechs or financial technology companies, with their innovative services enter a legal vacuum, which raises many concerns, especially in opposition to strongly regulated, conservative and traditional banking sector. The regulation can also be seen as an entry barrier, protecting the traditional banking business, which needs to turn to scale advance in face of commoditization. What is more, Fintechs rely on traditional banking system at one layer or another.

In order to mitigate the risks of legal vacuum, innovation hubs can join together companies and authorities for interpretation of legislative framework and licensing requirements. Regulatory sandboxes are frameworks for regulatory tests with the authority support and

supervision. Regulative certainty provision, principally to potential investors, makes innovation less costly and time-to-market can be shortened. RegTech and LegTech, correspondingly regulatory and legal innovation start-ups can also be helpful in this sense.

Crowdfunding as a trend in the Fintech area, at the end is more suitable for the lenders or investors (minor quantities being the case), not so much for the actual clients, or companies in need of financing as their costs and workloads are rather high (contacts management, marketing), compared to standard credit, for instance. What can be lowered, is their risk requirements, of course pertinent in case of start-ups.

PSD2 in case of Europe, brings together the APIs giving the option for collaboration (even if forced) between banks and start-ups, specifically the ones in the data aggregation business. There are ways to avoid the obstacles on the interface between banks and Fintechs in this sense, i.e. through practices of ‘screen scraping’ where the data aggregation application can log into the bank one as if they were customers and extract the information (Brainard, 2017). Another challenge for PSD2 is ‘unbundling’ of deposits and payments, the last one being the only attractive segment so far, as deposits can be replaced by insurances.

There are also some efforts in the Fintechs area in the field related to the Know-Your-Customer (KYC) field, especially for financing of segments such as self-employed or freelance and micro-companies, if not small and medium ones with booming presence on the market, due to the Future of Work impact. Their financial and risk assessment is currently comparatively outdated and incomplete and building their financial prestige is of vital importance⁸.

Digital currencies, blockchain and smart contracts

Cryptocurrencies are mainly digital (95% of them) with the aim of exchanging and storing values. Bitcoin is the most widely known and spread of them, however its disruptive potential is so far overturned by the associated speculation. Other digital currencies, more interesting from the economy disruption potential are going to be presented in the society innovation part of this document. Many companies go for ‘coins’ expressing the company stock through Initial Coins Offerings, i.e. ICOs as a cheaper alternative to the Public version (IPOs).

Blockchain comes as an architecture, originally underpinning the bitcoin cryptocurrency. Blockchain is based on distributed and encrypted ledger processes, which can be anonymous but also public, having unalterable and undeletable signed statements, that are reflected in all machines. In principle, the promise of blockchain is to make unnecessary the official middlemen or intermediary body.

⁸ For instance, incipient Crederit project.

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The encryption of the information, its (endless) storage and replication over the entire network, together with valuable services provided by middlemen entities such as anti-money laundering or fraud issues addressing and option for correction of the mistakes and tackling other negative-path issues of the users' journey. The energy consumption, speed and finally also cost of transactions are other negative sides of blockchain technology⁹.

Smart contracts are self-executing digital contracts written as service, where transfer of value is based on the previously reached agreement and cryptographic consent of the parties involved. Some of more standardised (also banking) contracts can probably be a good option for smart contracts. However, the 'grey zone' requiring human intervention here is in practice probably even more important. All these technologies, as argued by some (Swan, 2015) allow for destabilization of the current financial market due to the alternativization in the currency subject matter (Facebook Libra crypto initiative), value transfer and financing (ICOs), bringing more power and opportunity to small and medium-size actors.

Private banks currency issuance

The private banks and other private institutions were able to issue currencies at some points in the past centuries. In the United States the Free Banking era lasted from 1837 to 1866. However, with time they were forbidden, due to the different fraud, money laundering, counterfeiting, etc. practices.

Currently private banks currency last only in Scotland, Northern Ireland and Hong Kong. With the raise of digital and virtual currencies this topic is being timidly reopened. From the neoliberal outlook, the government monopoly also in this subject is seen pejoratively, private competition creates the impression of one-fits-all solution, enabling the competition and quality control through the supposedly stronger accountability of private companies. This perspective is rather insufficient in context of transnational private banks and for instance their associated tax responsiveness.

Academia views on banking innovation

Academic studies in the subject matter of the monetary, banking and financing sectors of the economy accompany mainly the institutional developments at the international level, explained previously. Additionally, due to the unpopularity of (neoliberal) austerity measures which were predisposed to tackle the recent crisis, there are proposal of other ways of action, described by themselves as 'operational realities'. Hereby, the Modern Monetary Theory and alternatives to the traditional fiat money issuance are presented; first one due to its relevance at the sociotechnical landscape level, the second one because of its potential impact on the general banking and monetary architecture.

⁹ As it can be seen by recent implementations, blockchain together with other technologies can also instrumentalise massive surveillance and control of citizens (China).

Modern Monetary Theory

Modern Monetary Theory (MMT) was first proposed by Wray in 1994 (Wray, 2014). It applies to fiat currency economy with floating interest rates. The main point of this theory is that state and household budget cannot be understood the same way; i.e. state budget does not require balance. MMT proposes an additional issuing of the currency by state in case of need, arguing that the government deficit adds to savings. However, it must be noted that the money should be related to real wealth, that can be taxed. Even if debunked, this theory proved its usefulness in bringing more caution into the austerity measures applied after the recent crisis.

Fiat money issuance innovation

There are currently three competing theories on money issuance and banking: financial intermediation, fractional reserve and financing through money creation. Financial intermediation, also called intermediation of loanable funds is currently the implicitly popular one. It says that banks lend out money from previously gathered deposits of their clients. It is related to 'market discipline' issue, as the money of the clients are lent without their knowledge and consent. In case of fractional reserve approach, banks lend money received from central bank reserves.

Recent inductive theories would however lead to the third theory: while extending credit, banks would generate the money by reclassifying 'accounts payable' into fictional customer deposits. This is allowed through the exemption of banks to 'Client Money Rules', which requires entities to separate customer money from assets and liabilities of a company. As there is no specific regulation for this case, this dynamic of 'creative accounting' is neglected (Werner, 2014). This is also possible because banks provide for the settlement of all non-cash transactions in the economy. This theory explains the colossal credit expansion during the last crisis, especially by ECB causing the negative distribution effects, from population to banks and from periphery to centre. It could also be a reason for M4 money supply big numbers.

The theory of financing through money creation leads to different proposal of current problems solution, taking away the power of money creation from private banks. This could be trespassed to small not-for-profit community banks but also to the central public bank. This kind of monetary policy is being called 'secure money', positive money, sovereign money, Full Reserve Banking, Limited Purpose Banking, etc., depending on the associated specificities. Peel law from XIX century, taking away paper money creation (highly insufficient in a digital era) from the commercial banks, is meant as a precedent for this policy (Ordóñez, 2018).

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Even if the solutions proposed by the last would not erase all the financial crisis in the secondary money markets, i.e. stock exchange, pension, hedge funds, etc., this would oblige the players 'to put the skin in the game' and not play with the money that are not own by their shareholders. There is still a huge challenge regarding the transition from old to the new system in the context of positive money concept. Another issue is the sociotechnical landscape or mindset. Even if worked by Nobel Prize scholars like Prescott, it is almost not worked on a scientific and political scene, besides some intents like Monetative in Germany, 2018 referendum in Switzerland, Positive Money initiative in UK or Dinero Positivo in Spain (Kubus, 2019).

Society is almost entirely out of the discussion, the subject seems to be too complex and not prioritized enough to enter the Overton window of social discussion, once the first wave of crisis has passed. We probably also assist a sub-optimal lock-up of all the innovation ecosystem, not allowing the innovation to overpass the niche level.

Banking and society

Hereby the relation between the capital and its impact on the inequality in the society is revised, with special reference to the periods of crisis accompanied by the procyclical nature of the banking sector. The innovative solutions of the alternative bottom-up currencies are introduced. Also, the global prospect of the metamodern perception is presented. It relates the individual position in the world in general and banking sector in particular.

Capital and inequality

There is a raising concern about the rampant capital positioning among the other means of production such as labour and land. Thomas Picketty raised the topic of labour and capital dissonance, causing the peripherization of the society, exacerbating the inequality in income and wealth distribution. His concern is related to faster capital reproduction as compared with the outcome increase. 'The past devours the future' (Picketty, 2014: 398), by bringing the future value to present and consuming it.

The proposed way of tackling this issue is a progressive annual tax on capital. As our current economy is based on multinational corporations, the level of the tax application should be able to reach them, applying it on supranational base. Here probably the pertinent question would be more on any (apart from symbolic) tax payment (not requiring it to be progressive) by addressing the tax avoiding schemes, based on tax jumping and fiscal paradises. This issue is relevant for big banking corporations, which weight is only increasing with current commodification or regulations increase requiring scale to bear them.

The 2008 crisis brought to the public consciousness the issue of banking sector procyclical nature, exacerbating the ups and downs of the economy. During the hype, monetary supply

expansion leads to speculative bubbles creation and reverts into making less sustainable the life of citizens, especially in case of real estates. Furthermore, private banks seem to be fully private when it comes to gains distribution, loses in turn are to be paid by the society in more or less direct ways. Some call even the process of ‘reverse class struggle’ or ‘class struggle from above’¹⁰ as opposed to the one from below. Direct costs of the last banking crisis are estimated at 40 billion euros, but indirect macroeconomic costs like GDP loss, unemployment, companies’ destruction, etc. are supposed to be as high as 600 billion euros (Fernández, 2018: 3).

The last crisis subject matter has an important area of relevance and it relates to the crisis tackling short term focus. During the crisis time, urgent issues are being addressed and long term, strategic ones are ‘postponed’, education or even science and research can be one example, climate change or natural environment issues are relegated in the same way. Real activity is replaced with the ‘theatre’ gimmicking, with a lot of mantras but little or waning financial support, see for instance the innovation field.

Alternative or complementary bottom-up currencies

Alternative or complementary (local) currency is an additional player to be considered apart from the fiat currency, generally produced by Central Bank in current economies. As studied on the society side, raised by Douglas Rushkoff (2016) or P2P Foundation¹¹, it is presented in this part.

It is called alternative or local currency, because it is to be used for daily transactions on local (or specific) markets. When used in combination with fiat currency, it is called Complementary Currency. Local, complementary currency is not a new idea, as it was already used in ancient cultures as Egypt. An ostrakon, a shard of pottery provides us with the idea of local currency. The main point is that it is quickly loses its value due to recoinage (new date version with lesser value). The value of such currency is not based on the precious metal it is being done from.

Current monetary architecture almost fully centred on fiat currency ‘leads to scarcity, centralization, concentration, secrecy and proprietarization’¹². Local currency, in change, is biased towards spending, collective investment and not saving or private hoarding. Fiat currency due to seigniorage, difference between the cost of producing currency and its nominative value; and the need for repayment with a positive interest rate, extracts the value

¹⁰ <https://petras.lahaine.org/the-two-faces-of-class-struggle-the-motor-force-for-historical-regression-or-advance/> (Last consultation on November 4th, 2019).

¹¹ <https://p2pfoundation.net>; https://wiki.p2pfoundation.net/Alternative_Currencies; https://wiki.p2pfoundation.net/Complementary_Currencies (Last consultation on November 4th, 2019).

¹² https://wiki.p2pfoundation.net/Open_Money (Last consultation on November 4th, 2019).

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from periphery to centre and also promotes the competition as it requires expansion allowing for the debt repayment. It also makes the business activity subdued to its debt structure.

There is an open money project starting in order to ‘develop a software and architecture to enable peer-based multiple local currencies’¹³, also RAMICS¹⁴ - Research Association on Monetary Innovation and Community and Complementary Currency Systems promotes regional currency and time banks. Open Money project introduces also an interesting way for acquisition of practical knowledge and familiarity with community money system functioning, it is a LETSplay game¹⁵. As in the case of positive money, these initiatives currently are currently only on the niche level stage.

Resource Based Economy would be a further, so far rather futuristic step in the context of monetary policies, erasing the need of money as a regulatory tool or value system. Ownership and trade are also abandoned and replaced with usership and sharing or giving on microlevel and proper management at macrolevel¹⁶.

Metamodern standpoint of the society

Physical and mathematic modelling related to the economic reality made possible the pyramid schemes gaming, at the end bringing (criminal) benefits too few and the impoverishment of the rest. The terms of the debate seem to be rational facing the irrational, confused and system determined both, in metamodern sense. Metamodernism brings also its associated notion of the ‘structure of feelings’ (Van den Akker, Gibbons, & Vermeulen, 2017), or the perception of ‘matrix’ or structure of control imposed by society projections on our ways of perception. It is related to the Colbert’s truthiness, where truth is more a product of emotional contagion and not empiricism coming from information or data (overflow) or critical thinking.

Furthermore, systemic-conspiracy responds to the conception of a conspiracy as a structural and systemic process rather than exclusively related to the conspiracy agents. Ruthless economic (exclusively centred on benefits) and geo-strategic calculation (power-struggle) which are in itself an ‘ideological pathology’, becomes ‘sucked into political and military process it ceases to control, leading to devastation that ends all calculation’. The point is that along the process both victims and executioner responsibility vanish, especially in what refers to its collective and systemic nature.

¹³ <https://openmoney.org/top/omanifesto.html> (Last consultation on November 4th, 2019).

¹⁴ <https://ramics.org> (Last consultation on November 4th, 2019).

¹⁵ <https://openmoney.org/letsplay/index.html> (Last consultation on November 4th, 2019). Even if difficult to check its real functioning.

¹⁶ https://wiki.p2pfoundation.net/Resource-Based_Economy (Last consultation on November 4th, 2019).

From the metamodern standpoint, however, even if the collective political progress is not available many times, at least we can progress by learning as individuals. We can do this by choosing as a stumbling block the assumption that the understanding is possible, that it is important to ‘dare to know’. As it is easier said than done, ethical action is even harder, but the faith is to be put in a simple (philosophical) form of progress. The existence of anti-intellectual forces that intentionally spread and traffic in misinformation and/or people who try to defund, discredit or deny education and learning should be acknowledged and they ought to be actively opposed.

Banking and natural environment

As previously stated, endemic weakness of the capitalism caused by the way the banking and monetary system works, relates to the growth requirement. Needless to say, that growth is highly correlated with natural resources consumption and depletion. The required growth orientation of the companies causes their short-term focus and competition orientation, both with negative impact on the environment protection questions. Another is its procyclical nature, with similar consequences when it comes to the natural environment impact.

Banking sector financing in developing countries sums up to over 90% and two thirds worldwide. The investment needed till 2050 in order to reach the Paris Agreement are estimated at the level of at least USD 60 trillion¹⁷. Thus, banks are crucial for sustainable economy transition. It is not only because they can finance the future, but even more, they are also the ones currently financing the fossil fuels-based economy (Buckley, 2019).

Green transition commitment of the banks

There are several drawbacks in what refers to banking sector commitment to ‘green transition’¹⁸: It is only a half of the banks that explicitly commit to sustainability. More than that, these commitments in their terms and definition vary greatly across different banks, consequently and not surprisingly the methodology to measure the commitments is also full of shortcomings, previously mentioned fossil-fuels suppose a bigger chunk of the financing of majority of the banks. There are several ways of climate-friendly actions of the banks¹⁹: recent Principles for Responsible Financing²⁰, Task Force on Climate-related Financial

¹⁷ <https://www.unepfi.org/news/industries/banking/130-banks-holding-usd-47-trillion-in-assets-commit-to-climate-action-and-sustainability/> (Last consultation on November 4th, 2019).

¹⁸ <https://www.wri.org/blog/2019/10/how-are-banks-doing-sustainable-finance-commitments-not-good-enough> (Last consultation on November 4th, 2019).

¹⁹ Idem

²⁰ <https://www.unepfi.org/banking/bankingprinciples/> (Last consultation on November 4th, 2019).

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Disclosure (TCFD)²¹ report, Science Based Target Initiative (SBTi)²², Re100²³ electricity sourcing, restricting coal financing²⁴.

Natural environment related currency proposals

There are some interesting proposals of currencies which would back the natural environment cycles and recovery. Emission Reduction Currency system²⁵ tries to create a behavioural change or carbon-based currency (Buckminster, 1969). So, called ‘stable coin’ would be backed by solidified and safely-sequestered carbon that has been “mined” by a global army of prospectors²⁶, in this way bringing value as a useful resource to what is currently considered waste and pollution. This digital currency would use the local banks for chits, i.e. rewards for carbon sequestration and in this way, promote the exchange. In this way, every citizen around the world could use the available technologies and would not require high investments in the big-scale technologies. Biochars made of solidified carbon could be an alternative to gold, being portable, non-decaying, easily divisible, and quantifiable, its availability (and scarcity) will depend on the nature. The functioning is related to the dispersed fractional reserve system.

CONCLUSIONS

Innovation is currently understood as the main force of progress in the global economy and socioecology. However, at the international authorities’ level, the issue addressed by the traditional banking and monetary sector is the system and prices stability, understood in terms of laying a proper background structure for the activities of economic and other agents, rather than any systemic innovation concerns. In an ideal world, this stability should lead to the sustainability of the economic and socioecological system itself. However, from what we can realize along the study is that the dynamics of the banking and above all financial sector display high fluctuations, destabilizing in this way not only the economy.

The digitalization only acerbates this tendency, because in comparison to the ‘physical’ world the changes can be massive and instantaneous, and procyclical instead of countercyclical, especially due to boosted ‘herd effect’, i.e. following what others are doing, an example can be subprime credit expansion all over the world. The kind of passive if not reactive approach

²¹ <https://www.unepfi.org/banking/tcfd/> (Last consultation on November 4th, 2019).

²² <https://sciencebasedtargets.org/financial-institutions/> (Last consultation on November 4th, 2019).

²³ <http://there100.org> (Last consultation on November 4th, 2019).

²⁴ <https://www.bloomberg.com/news/articles/2018-12-04/five-of-europe-s-biggest-banks-join-low-carbon-lending-effort> (Last consultation on November 4th, 2019).

²⁵ https://wiki.p2pfoundation.net/Emissions_Reduction_Currency_System (Last consultation on November 4th, 2019).

²⁶ <http://www.publicseminar.org/essays/more-precious-than-gold/> (Last consultation on November 4th, 2019).

to innovation reinforces the current status quo, in short term it can allow the system continuity but in the long run it does not really improve competitiveness as the (over)protected current banking institutions when not really obliged to innovate, become in this way more fragile and prone to crisis adversities.

When carefully checked, emerging banking and monetary innovation ecosystem' depiction brings forward its rather fragmented nature. Every dimension has the appearance of working on the issue of endemic weakness of the banking and monetary system, but their efforts go in sort of different directions. Nonetheless, at some points they could also become complementary, for instance, when different, complementary currencies can be used in the same economy. Banking authorities are concentrated on the liquidity and regulation questions related frequently to risk minutiae of banks and specifically credit functioning. Secular stagnation fear with low interest rates, furtherly drained the benefits from current banking business, taking away the time value.

Many financial markets instruments apply the mechanisms of bringing future value to present, which over time can cause what some address as 'black hole of debt'²⁷ (and spaghettification of economy) starting with the unfunded liabilities (bonds). Purchase of large-scale assets brought the investment in equities and incentivised another hyperactivity of stock market, reinforcing the capital reign over other dimensions of economy and socioecology of the current ecosystem.

Regulations are increasing the dependence on scale, boosting concentration (mergers and acquisitions), and developing stronger entry barriers. Needless to stress, these activities are not helping competition, many times are even impeding it. There are however some cases, where the regulation would bring also the collaboration enforcements as the PSD2 directive, with APIs policies, its tries to deregulate the traditional banking monopoly in favour of FinTechs. It implies cooperation in what relates to customer data.

Nonetheless, the impression is that that the FinTechs in many cases are only pilots, once tested they become incorporated in FAANG (Facebook, Amazon, Apple, Netflix, Google) and other related Big Tech companies. They are more and more able to quite quickly engulf the traditional markets. In short term, they are innovative but in the long term their emerging architecture turns to be more depredatory than anything else.

They become multinational monopolies or oligopolies without the power to control and regulate them effectively. The lack of transparency and fiscal freedom seem to be their implicit characteristic, furtherly increased by Artificial Intelligence, apparently without the option to audit it. Apart from that, fintechs are taking away the more interesting segments of

²⁷ <https://www.youtube.com/watch?v=u3ojPk8CQns> (Last consultation on November 4th, 2019).

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the business, especially from the benefits point of view, reinforcing the difficult situation of the traditional banking. Out of the traditional banking regulation there is a shadow banking sector, associated to the M4 money supply. Both are causes to concerns, especially due to their size as compared to the real economy.

Ostensibly innovative solution as digital cryptocurrency, which could in principle repair the broken link between money and value (Rushkoff, 2011; 2016). i.e. bitcoin is reducing its innovation scope, by changing only the currency production body, perhaps erasing some middle-men in the process due to blockchain, at the end entering the hype of speculation in order to supposedly prove its validity in this way. Probably it is related to the unicorns' search dynamic in the innovation field, where the risk is so high that the companies that function must compensate for all the losses requiring geometric growth.

New approaches arising from the Academia, based on 'operational realities' even if not solvent from the theoretical outlook as the MMT, proves their utility in moderating the austerity measures. The new solutions to money issuance, such as positive money, seem promising, notably as they require the central bank accounts for individuals and companies, that due to the technological advances are being currently under revision for implementation by some banks. Anyway, they are so far stuck at the niche level, enabled once by the opportunity window of last financial and economic crisis, they strike one as being out of play nowadays. Perhaps the climate emergence can open a new opportunity window, when it transcends from the sociotechnical landscape to other levels.

The currency innovations show every sign of being up and coming, it is a field that can be found almost at each level. Some even advocate for a supranational entity for the issuance of truly international, the point is the accountability of such an institution. This concern is also raised for the case of central banks digital currency issuance. Complementary, alternative or local currencies have the conditions of attractive study fields for the researches, particularly inspiring from the community point of view. Especially this last type of currencies could bring along more cooperation and sustainability due their implicit way of functioning. Also, the natural environment related currencies proposals demonstrate their usefulness (so far in terms of intellectual exercise) as they would allow the orchestration of the efforts of the economic agents toward the environmental goals. What is more, the alternative also digital currencies at the global level can be considered as a leverage to the USD and its associated economic and political power, called by some weaponised and oppressive economic tool.

Society is sceptical and scared by more or less justified complexity of the banking and monetary system functioning, not allowing the related subject to enter the Overton window of public debate. Commodification of our culture and lives and financialization of the economy are the undergoing processes which furtherly make the understanding of the

banking innovation more pertinent. Indeed, there are some innovative ways of making society familiar with more complex questions, this could be the gamification as in the case of LETSplay game²⁸, which with minor time investment promises to help understand the way of open community money system functioning.

Banking and financial sectors are uniquely constitutive to the economy and society in the modern world where capitalist system is prevailing. Capital inexorably and at an accelerated pace takes its prevalence over other factors of production such as labour and land (Picketty, 2014). Rampant inequality and natural environment exhaustion are some of the most rampant outcomes of such configuration. If not properly addressed this could lead to the socioeconomic neo-feudalism (Galbraith, 2017).

From the collective intelligence perspective, the supranational structure of the banking and monetary sector, in the digital world more than ever transcends the borders and has its global impact. This would also apply to natural environment. Climate change is global and what is more, it cannot be addressed by one region or location only, more collaboration than competition would be required in order to reach sustainability. Especially, in case of banking and natural environment dimensions with their transactional nature, the actors become relevant not so much because of their agency but much more because of the relations their bring. The context of liquid reality (Bauman, 1999) and relational sociology (Donati, 2007) could bring a deeper inside to the subject.

The further quest regarding value refers also to value creation versus value extraction²⁹ and the functioning socioeconomic system should definitely privilege and harness the first one, which is not always the case for capital and banking and financing sector. This could be an interesting aspect for further research.

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²⁸ <https://openmoney.org/letsplay/index.html> (Last consultation on November 4th, 2019).

²⁹ https://www.project-syndicate.org/commentary/platform-economy-digital-feudalism-by-mariana-mazzucato-2019-10?utm_source=Project+Syndicate+Newsletter&utm_campaign=d192f2bc47-sunday_newsletter_6_10_2019&utm_medium=email&utm_term=0_73bad5b7d8-d192f2bc47-105013549&mc_cid=d192f2bc47&mc_eid=a8cee90b20 (Last consultation on November 4th, 2019).

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ⁱ This document is part of the PhD thesis on Innovation Ecosystems in the EU