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FINANCIAL BUBBLES FOR ECONOMIC DEVELOPMENT: IMPLICATIONS REGARDING ICOs

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Abstract:

Most people consider financial bubbles as the result of speculations and manipulations, and that less of them will make a market economy more efficient. While speculative bubbles no doubt increase the risks and uncertainties of investors, there are many episodes in human civilization where financial bubbles are commensurate with real positive contribution to real development of an economy. This paper analyzes this issue from theoretical perspectives and in the context of recent new financial instruments created from the technology of blockchain.

Key words: *Financial bubbles, economic development, ICOs*

1. Introduction

Financial bubbles are usually accompanied by rapid and radical price increases in a very short period of time. A classic example of a financial bubble is the 1720 financial market bubble experienced in several European countries. In that year, stock markets in Great Britain, France, Netherlands, and beyond witnessed a dramatic price run-up within a couple of months and then a significant setback. For instance, the share price of the South Sea Company started from £128 in January, it rose all the way up to £550 in May, and then collapsed to below £200 by end of the year.

What have made some investors suddenly willing to pay several multiplies for the financial asset? Early research on the subject (e.g., see: Schiller, 2000) mentioned investor irrationality as possible cause. Some recent studies, Pastor and Veronesi (2009) turned to fundamental economic developments that have changed investor expectations for the explanation of financial bubbles. Frehen et al. (2013)'s research on the first global financial bubble in 1720 provide an insightful case study following this stream of studies.

Frehen et al. (2013) document four innovations underlining the bubble of 1720. First, several high profile companies including South Sea Company in Great Britain and Mississippi Company in France conducted debt-to-equity swap. The recapitalization

aligned the government with the shareholders, and was considered as a financial innovation at the time. Second, France and Britain were emerging around 1720 beginning to challenge Spain's dominance in the Atlantic trade. Thus, there were fundamental economic development going on besides investors' mere speculation. Third, in 1720, Britain, Netherlands, and Germany allowed maritime insurance corporations to raise capital by issuing shares. The move brought a wave of IPOs in 1720 and shifted the landscape of risk sharing business. Fourth, leading up to 1720 some entrepreneurs repurposed chartered corporations to pursue new business adventures by utilizing their chartered rights to issue new shares until the passage of Bubble Act in June 1720. By analyzing a self-collected data set on the stock price changes, Frehen et al. (2013) conclude that the 1720 bubble is not purely caused by investor irrational exuberance. Instead, it was supported by fundamentals such as Atlantic trade prospects and financial innovations that were emerging at the time.

It is important to note that innovation is an activity that is not necessarily rational in that it can be justified by a clear benefit-cost analysis. No innovation is *ex-ante* irrational. Often driven by gut-feeling and a passionate drive for dreams beyond activities routinely conducted, innovation is the essence of economic development, Schumpeter (1982). Because innovation is uncertain and risky, some innovation can appear irrational *ex post*. People's expectation about economic and innovative new direction vary much wider than those that can be objectively estimated by earnings and present value calculations. Expectation itself has volatility depending on emerging information that, although possibly including faked news or being overly optimistic, it is nevertheless driven by a Hayekian real world counter-part (Hayek, 1945).ⁱⁱ It is not necessarily a financial bubble.

The paper proceeds as follows. Section 2 gives some theoretical considerations to why bubbles while not always induce real economic changes, can in some situations resulting in positive contributions. Section 3 describes a reflexivity framework to explain the relation between financial bubbles and economic development. Section 4 draws the analogy of public trading of initial coin offerings (ICOs) by providing examples of speculative buying of this instrument that may result in positive societal benefits. Section 5 concludes the paper.

2. Theoretical considerations of financial bubbles and economic development

Economists have long studied bubbles. It was the 1st Nobel Prize Winner in Economics, Paul A. Samuelson, who hinted that fiat money is itself a bubble, because its intrinsic value is zero (Samuelson, 1958). A very concise summary of many economists' various notions of bubbles can be found in an article in the *Handbook of the Economics of Finance* by Brunnermeier and Oehmke (2013). There is no question that some rationales exist for the existence of bubbles. The subject can also be approached from the pragmatic angles of optimism, speculation, extrapolation, fear-of-missing-out (FOMO).ⁱⁱⁱ Of interest to us is the efficiency implications of bubbles. We can highlight these below based on theoretical and pragmatic considerations:

- 1) Although the incentive to hold on to a financial asset depends solely on dividend and expected change in asset price, the latter being the primary motive for speculation, financial assets also reflect as well as giving the right of the owner to control real assets. To some people, the value derived from the owning of the real assets, of which the financial assets are only the nominal representation, can be much higher than the value of the financial assets, even if a large component of the financial assets is purely speculative. It is the action of these “optimistic” investors who will invest their time and other resources in realizing their dreams beyond the nominal value of the financial assets they are holding. These optimistic investors may even buy more when there is a “burst” of the bubble, because they see their cultivation of developing the real assets to eventually revealing fundamental values that do not have to rely on the speculative component of the financial assets. The bubbles boost their ego and speed up development of the dream on how the real assets they possess will reach the potential that is achievable. As Brunnermeier and Oehmke (2013) put it, rational bubbles can sustain “if their presence allows for an improvement over the allocation in the economy absent the bubble”.
- 2) The economy may have embedded constraints that prevent efficient allocation of resources to begin with, e.g. a borrowing constraint. A speculative bubble provides alternative means to finance technological innovation that would not be possible be done through conventional financing based on future earnings. For scenarios where prior conditions are characterized by over-investment already, bubbles raise investment costs thus adjusting the investment level to a more optimal level. The board angle suggested by economists arises from inefficiencies caused by overlapping generations (OLG) in that the retiring generations cannot contract directly with the younger generations. This consideration addresses to a boarder concept of development beyond the microeconomics of activities, e.g. the building of a project or the invention of a particular technology. It nevertheless provides a reason for the positive contribution of bubbles from a macro perspective.
- 3) Bubbles can “crowd in” funds for productive investment especially if there are “lazy” investors who do not wish to study fundamentals. They would opt for investment strategies based on extrapolations, trends, and market euphoria. “Naive speculators” buying into bubbles are investing like gambling in a casino, which is where their funds will go if there were no bubbles for them to seek abnormal high return. Casino money goes to the owners of gambling licenses. Bubble money can go to optimistic entrepreneurs who have to also risk their time and other resources to produce or to invent. To some people, this is considered to be devious motivation, but not so if one also considers what the alleged “victims” could have done with their money. We do not live in a world where everything is driven by fundamental values.
- 4) Bubbles can come from FOMO. FOMO is a recent terminology to characterize why people could buy or endorse to a belief even without full information on what they are buying or what those beliefs really are. Neoclassical economics would not accept that being possible, as all preferences and production functions are assumed to be given. On the purchase of any goods or assets, it is traditionally assumed that inert information of what an individual wants and what the goods they are being are known.

Information costs are brought into traditional analyses by including situation where information concerning product or asset qualities requires additional resources to find out. This belong to a class of problem known as transaction cost problems in economics. FOMO attempts to characterize a phenomenon more than that explainable by transaction costs. It came primarily from a psychological motivation as described in Przybylsk, Murayama, DeHaan (2013) “pervasive apprehension that others might be having rewarding experiences from which one is absent”, although others and in the field of marketing has begun addressing to that prior to that. Yu (1984) formulated an economic model illustrating the essence of competition being “the prospect of getting ahead of other manufacturers and the fear of being left behind.” An important feature in the model used is economies of scale, the case of a natural monopoly. This scale condition is a natural breeding ground for clustering and bubbles. All these, according to Yu (1984), is not pure greed, but an efficiency reason for dealing with a natural monopoly, organization changes that has real contribution to real economic development.

Can there be rational bubbles that generate real economic benefits? The answer is unequivocally a yes. The proposition could be paradoxical if the financial system of an economy is viewed purely as a saving-investment channel for the real sector of an economy. This is the circular flow macroeconomic picture that is taught in most conventional economic textbooks—financial sector absorbs savings from the economy which are turned into investment for the real economy (See Figure 1 below).

Figure 1: Real and Financial Sector of an Economy

Source: <http://mpstudy.com/economy-barter-money-bitcoin-circular-flow-income-savings-investment-time-value-money-deferred-payments-part-2/2/>

Bubbles in this conventional framework can be wasteful, because the activities are only happening in the financial system, and until resources are converted into real economic activities, bubbles are noise, frictions, and poisons that an efficient market system should avoid. What we’ve shown in this section is that there are real economic activities associated with financial bubbles, and that bubbles can in certain situation alter the real

economic sector in terms of its normal way of doing business. Some of those improvements can be of long run benefits contributing to growth for an economy.

3. A reflexivity framework

Economists have long blamed irrational investor exuberance as the cause of financial bubbles. A financial bubble typically starts with a quick run-up due to irrational expectations and then followed by a correction due to the follow-on reversals on investor enthusiasm. In this framework, economists attribute asset bubbles to ignorance of economic fundamentals, overreaction to news, and the presence of herd behavior. For example, in the years leading to the recent U.S. housing market bubble, a 2002 U.S. survey shows that home buyers heavily rely on near-term experience when they are making a housing decision. More than 80% of respondents state that price increases in the near term encourage them to buy a house (Case, Quigley, & Shiller., 2003). One shortcoming of this framework is that it lacks the ability to explain why the bubble occurs at the very beginning in certain asset class, sector, or industry. Instead in this section we formulate the notion of a reflexivity model as suggested by George Soros (2013). Although commonly heavily criticized as an opportunistic hedge fund speculator, Soros believes that there can be a bridge linking investor expectation, financial bubbles, and economic development.

Figure 2: A Reflexivity model of Financial Bubbles and Economic Development

Source: prepared by authors

The above conceptualization suggests that there is a two-way connection between financial market and underlying reality. In our context, economic development such as technological innovation and population growth can alter investor perception on asset valuation. The classical finance theory defines the intrinsic value of an asset as the present value of all future cash flows that can be derived from the asset. An asset bubble can

emerge when the asset price is far away from the perceived intrinsic value based on conventional assumptions upon discount rate and projected future cash flows. In this context, an asset bubble and its high asset valuations can also be justified by marginal investor's belief upon transformative improvement in economic fundamentals and a future cash flow windfall. For instance, if investors believe that a potentially transformative technological breakthrough is expected to increase a company's annual cash flow by 100%, then they will push the asset price by the same magnitude holding other things equal. This concept is compatible with the role of prices as transmitter of knowledge according to Hayek (1945).

The reflexivity model is also consistent with Schumpeter's notion of economic development, which discusses economic change broadly in terms of outside circular flow activities in relation to inside circular flow activities. That the economy is actually a dual circle in terms of how resources are used was not explained in the context of specific prices, but clearly in terms of his explanation of business cycle, making a distinction between cycles versus growth (Aydin & Takay, 2012; Croitoru, 2017; Geiger, 2014). Thus, contrary to the criticism of Hayek on Schumpeter, Schumpeter did address to price, but "aggregate" price in terms of an inflation index, rather than specific prices of a company or a product. Schumpeter, in his monumental study of business cycle (Schumpeter, 1939), characterized the ups and downs of an economy in terms of 3 types of statistical cycles. Surely, prospects of changes can create euphoria that many could be followed by a process of *creative destruction*. These are not bubbles, but a process merely reflecting the emerging new information of prospects and challenges.

The inflated asset price can help encourage entrepreneurship, innovation, and investment and further boost economic development: capital raising and incentive mechanism. This operates on the economy as a whole as well as specific instances of specific entrepreneurial endeavors. As described in Section I of this article, Frehen et al. (2013) found that a flood of new initial public offerings (IPOs) and seasoned equity offerings (SEOs) in the Netherlands beginning in July 1720, associated with the South Sea Company boom. The wave lasted for two months and ended with the collapse of South Sea Company share price. The funds raised, nevertheless, were utilized to advance Atlantic trade, which eventually became the dominant trade route in the 18th century. The lesson to be learned, therefore, is that unintended consequence could very well be of a positive broader scope that can contribute to the beginning of a very significant economic change.

The modern dot-com bubble in the late 1990s is another great example. Telecommunication equipment provides raise capital from investors to fund investment in high-speed equipment and fiber optic cables which make further innovation possible. Another channel for asset bubble to spark economic innovation is through incentive mechanism. For example, a company can utilize share based compensation to motivate employees.

With all being said, our proposition that financial bubbles can lead to economic development is subjected to a caveat: The positive feedback loop between asset bubble and economic development may fall apart in two scenarios: first, sometimes the imputed growth rate by investors turn out to be irrationally high *ex post* and the asset price will

collapse as the reality unfolds itself. Investor sentiment can also shift due to an external shock such as a liquidity driven event. We cannot say that financial bubbles of all types can lead to economic development. Yet, financial innovations of all kinds have arisen in recent years that specific products for innovation (i.e. development) can now be isolated to be studied for a financial sector contribution to the real sector of an industry or an economy. An example of that can be shown in the next section.

4. Implications for ICOs

Initial Coin Offerings (ICOs) have been a recent newly created class of financial instruments, mostly for creating platforms using blockchain technology to facilitate members doing things on the platforms. The coins (or tokens) created allow transactions being made on the platforms, which often are still in the process of being designed and implemented as the ICOs are being sold. To some people, this is a bubble if not an outright scam. Many well-known economists have publicly given negative opinions about them. A rapidly increasing resale value of ICO is considered by some a classic case of a bubble. The regulatory authorities in many countries simply ban them outright.

An article from *The Economist*^{iv} in November 2017 states that the amount of money raised by start-ups in ICOs reached \$3.2 billion for 2017 and surpassed early stage venture capital (VC) funding for internet. *CB Insights*, similarly, points out that “ICOs raised over \$5B across nearly 800 deals in 2017 while equity investors deployed \$1B in 215 deals to the sector.”^v Another study reveals that ICOs on average achieved 123% return in the USA and 97% return in the other countries in their first listing day (Felix & von Eije, 2019), contrasting ICOs with IPOs. An ICO investor can double their money in a few days if they purchased the tokens at the price offered by the start-ups and then sell them in the secondary market. The tremendous first-day price run-up in ICOs sparked the money flood into the market, despite the fact that half of ICOs die within four months after token sales finalized^{vi}.

Yet, ICOs are not necessarily bubbles in the same sense that IPO underpricing does not necessarily imply a bubble. Li and Mann (2018), provides economic rationales supporting the concept of ICO. The authors mention two reasons for viewing ICOs as beneficial, in spite of its possible speculative motivation. The first has to do with a network effects of running a platform, i.e. the participation of one individual depends also on others participating on it. Indeed, entrepreneurs need to work together on a platform that have potential improvements in order for the platform to win a technology competition. For example, Ripple lures top talents by paying them their ICOs, XRP.^{vii} Likewise, this incentive mechanism can work for outside talents too. By accepting the tokens as the means of payment to purchase goods and services provided on the platform by start-ups, entrepreneurs can align their incentives with the interest of external stakeholders of platform. To both the inside and the outside entrepreneurs, the incurring of their times is the investment. The tokens are means to do things (gain utility) on the platform.

The second reason for that ICOs can be beneficial is that there may be a genuine sharing of information about the quality of the platform (existing or forthcoming) that ICOs can enable. In their words, “information about the platform quality dispersed within the user

base incentivizes each user to learn the “wisdom of the crowd” so as to make more informed participation decisions.”

The two reasons suggested by Li and Mann (2018), although difficult to prove, reinforce the scale economies feature mentioned in Section 2. The explosiveness of this feature being that either an ICO is unsuccessful, i.e. no one wants to own it; or, an euphoria can be created that everyone wants to buy or own it. In this process of rushing to own, which at a micro level happens because of FOMO, can be viewed as a form of crowd funding. Certainly, crowd funding is itself an innovation in the methods of financing; as such, it is not different from other innovative forms of financing such as micro-financing which has economic development implications.

Compared with traditional financing channels such as bank loan and ventral capital, ICOs can have beneficial economic properties. ICOs can allow entrepreneurs to avoid the dilution of their ownership or interest burdens, but still provide a return potential to ICO investors. The ICOs are already transforming the technology industry, such as SingularDTV for content and digital rights management, the DAO for decentralized autonomous organization, and ICONOMI for managing digital assets (Tapscott & Tapscott, 2017).

There are therefore two reasons why ICOs are related to economic development. First, they are themselves financial innovations; as such they are economic development in the sense of “outside circular flow” as defined by Schumpeter. Second, they can lead to innovations in the real sector of the economy. (See the interaction between the financial and the real sector of an economy in Figure 1). The two efficiency criteria suggested in Li and Mann (2018) are largely socially beneficial ICOs for solving problems, for making a platform more efficient; and as such, are efficiency gains associated with activities in the real sector, but innovation can arise in the financial sector also, as we’ve argued that bubbles being a form of crowd financing.

The question worth contemplation is for the grey area where such criteria cannot be objectively proven; and while a particular ICO is experiencing an euphoria driven primarily by the FOMO sentiment, whether should regulators step in to regulate? We note that much of the buying and selling of an ICO is for speculative or exchange purposes and not for utility purpose. I.e. buyers of an ICO aim to hold and resell, rather than using the ICO to do transactions on the platform or paying technicians to improve the platform. For those using the ICOs for utility purpose, some could be at the moment or their initial purchase was buying because of FOMO, i.e. they do not want to miss out of an emerging platform that has great potentials, just like anyone joining a start-up firms. Many, however, after a period of evaluation, may decide that a particular platform is not promising the potentials as much as they initially thought, and thus sell. This type of economic development activities (ala Schumpeter) can be contrasted with the buyers and sellers who are purely acting on price trends. Empirically, regulators have no way of distinguishing the two types. For practical purpose, for any ICO marketing to be enticing beyond speculative motives, it is necessary to stress the fundamental economic values that can be created by the technology (Lorne et al., 2018). If bubbles are accepted to have positive contribution, the tolerance level of regulation may need to lean towards leniency, or at least a waiting period longer than what objective evidence is not sufficiently revealing.

At the point of writing of this article, Ripple is going through lawsuits as well as possible IPOs. The question of whether an ICO is a commodity or a security will be debated for a long time. Ripple's platform *RippleNet* provides an On-Demand-Liquidity (ODL) that utilizes tokens XRP as bridge currency for cross-border business transactions. Considering the high transaction fees that SWIFT is charging, there are clear efficiency gains in the lowering of transaction costs of cross-border transactions, which is an economic development type of innovation. However, like any innovations, an innovation can have long adoption period, and is subject to competition. Even though Ripple is alleged to have more than 300 international financial institutions using their platform, their usage is not 100%. Certainly, there are XRP owners holding on it (i.e. not using it in the sense of utility) but as a means to speculate or a store of wealth too. Generally speaking, the proof of utility for an ICO can be as elusive as the proof of economists' utility function. This may not be different from the proof of utility of fiat money, which can also be elusive except universally accepted to be found on the three theoretical function of money, all aiming to reducing transaction costs, which is economic development.

5. Conclusion

Bubble is not a dirty word that efficiency discussion necessarily wants to avoid. This paper provides some examples and reasoning for bubbles that can lead to real economic development. Recent phenomena on ICOs leave an unsettling impression that this financial instrument is a classic case of bubble in that there are no real economic values to provide for its fundamental value. Proponents of this view only need to reflect on the proposition of Samuelson that fiat money itself has no intrinsic values. Yet, the biggest bubble of all—fiat money—has continually held up its value. The bubble has not been burst, and in the process has contributed many economic benefits to many people. We also conclude that, at least to some degree, asset bubbles can be explained by the change in investor expectation driven by improvement in fundamentals such as technological innovation. Then the capital flowed into the bubbles can be used to feed further innovation and form a positive feedback loop.

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ⁱ A classic and a Nobel Prize winning essay concerning the role of knowledge (i.e. information) nevertheless contains an attack on Schumpeter that is not germane to the proposition made by Schumpeter: "Professor Schumpeter argues that the possibility of a rational calculation in the absence of markets for the factors of production follows for the theorist "from the elementary proposition that consumers in evaluating ('demanding') consumers' goods *ipso facto* also evaluate the means of production which enter into the production of these goods." P.529.

ⁱⁱ We do not include the possibility of the timing of the "greater fools" as described in Spacey (2017) because the guessing game of the number of fools do not appear to be an economic development activity. It is certainly a zero-sum game that is contrary to the spirit of creating win-win opportunities.

ⁱⁱⁱ <https://www.economist.com/leaders/2017/11/09/the-meaning-in-the-madness-of-initial-coin-offerings>

^{iv} <https://www.cbinsights.com/research/blockchain-vc-ico-funding/>

^v <https://www.bloomberg.com/news/articles/2018-07-09/half-of-icos-die-within-four-months-after-token-sales-finalized>

^{vi} www.coindesk.com/ripple-xrp-crypto-bonuses

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