The evolution and diversity of modern moneys: Self-fulfillment of custom and expectations in legal tenders, crypto currencies and community currencies

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1. Introduction

This paper aims at providing a new way of understanding modern moneys without intrinsic value as institutions by stressing their self-fulfilling/self-destructive property from evolutionary perspective.

2. An evolutionary tree diagram of money

There are two contrasting dominant theories on origin of money: commodity/goods theory of money (by K. Marx and C. Menger) and credit/claim theory of money (by J. M. Keynes and G. F. Knapp). They are frequently considered to be incompatible.

However, from historical observations, we find that both commodity money and credit money existed and endured in fairly primitive societies. Furthermore, when considering the nature of modern money, it is more crucial to understand that the typical modern money as a central bank note as a legal tender is the integration of both commodity as material and credit as information, rather than to identify which of two is more plausible as the principle of the origin of money.

The difference of explanations does not matter so much as it appears in the first place, as long as legal tenders still need any minimum materials such as highly sophisticated printed papers or minted coins so that they cannot be duplicated or counterfeited so cheaply as bits on the internet. On the other hand, emergence of money should be explained as the dynamic process of generation of money and market as bilateral sale and purchase network, in which enormous kinds of goods should have been once differentiated into money and commodities.

Then we depict schematic transition in generation of money (Fig.1), the dynamic process of direct exchangeability or saleability (popularity) in generation of money (Fig.2), as well as an evolutionary diagram of money (Fig.3) as follows.
Fig-1  Schematic transition in generation of money

Fig-2 the dynamic process of direct exchangeability or saleability (popularity) in generation of money (by multi-agent simulation on emergence of money)
3. Diversification of Money since 1970s

In 1971, U.S. President Nixon declared to stop the exchange of the U.S. dollar to gold, and in 1973, the international currency system changed to a floating exchange rate system. Since then, the euro currency markets expanded and offshore trade increased. Since the late 1980s, derivatives such as futures, options, and swaps grew rapidly, in the form of foreign exchange and interest rate transactions.

The collapse of post-WWII Breton Woods system - the gold and dollar standard and the fixed exchange rate system - and the transition to the floating exchange rate system in 1973, resulted in an end to the independent control of international currency by the United States. This also means no nation can no longer autonomously manage monetary stock and domestic gross demand through Keynesian policies.

Since the 1970s, there are two tendencies occurring: a transition from an industrial economy to a post-industrial, service and information economy, and non-materialization of money shown in the
process in which money shifted from gold-dollar standard to floating exchange rate system as pure informational money linked to no material goods. The first tendency resulted in diffusion of Internet and it accelerated the second tendency. As a result, modern moneys diversified into credit cards, electronic money, corporate points/miles, community currencies, and crypto currencies. The evolutionary tree in Fig-3 does not show the phylogenetic relation from cash and deposit money to most modern firms of money because they are not made clear at this moment.

4. The basic property of modern money as self-fulfillment of custom and expectations

Money has the power to buy a good by itself, namely, “purchasing power.” A good, on the other hand, has no power to buy other goods or money. Considering the relationship between money and a good, money can be compared to an omnipotent emperor and the good to a servant who obey the emperor. We will now try to explain the basic property of modern money by using a famous fairly tale of “The Emperor’s New Clothes.”

The story is often remembered for teaching that an honest child can better see the truth than adults. But the core of the story lies elsewhere. No matter what he wears, the emperor is great to his servants and the crowd. They cannot laugh at him, for they could be charged for lèse majesté and sent to prison. Some may think it better to behave as though the emperor wore the clothes, even if it is not true. Also, if you say you cannot see the clothes, you are showing yourself up as a fool and a person of low rank, which you do not wish to do. These considerations also apply to the emperor himself.

By believing or pretending to believe that something is there even though there is nothing, the “reality” would self-emerge as if there was something. Strangely enough, self-fulfilling ideas occur even in these circumstances. There is no single reason why people cannot say “the emperor is wearing nothing;” there are a number of reasons. As a result “the naked emperor” is a strong and solid one as a self-fulfilling idea.

As we will see below, this applies to fiat money. There is no difference between how the emperor’s invisible clothes were accepted as great and how fiat money with no money in itself circulates as
money. We do not accept a ten thousand yen bill because it has a value of ten thousand yen. Most people don’t wonder if the bill has a intrinsic value of ten thousand yen. Maybe they don’t even bother to care whether it is real or fake. People most likely think they can use it since everyone else uses it or they believe they can use it today because it worked yesterday. Let’s consider a little further what kind of logic works here.

The self-fulfillment of custom

Let’s discuss a ten thousand yen bill some more. According to the Bank of Japan Act, “the banknotes issued by the Bank of Japan shall be legal tender and hence shall be used for payment without limit.” The banknotes are “legal tender” guaranteed by the laws of Japan. It is as great a thing as the emperor backed by state power. If you refuse to accept a ten thousand bill in Japan claiming it is not money but a piece of paper, you could be punished for breaking the law.

So, do people accept the bill because it is backed by legal power? Probably this is too narrow an explanation. It is wrong to assume that you can force people to do something by law and the threat of punishment. Generally speaking, law can prevent crime and illegal activities from happening by forbidding them, but they cannot force people to do something in particular. The law can punish when someone goes against it, but it cannot provide a positive incentive when someone conforms to it. Therefore, there must be benefits for individuals of accepting ten thousand bill apart from state power and the law.

The minister and the crowd thought, but did not say “the emperor has no clothes”, not because they were afraid of the emperor’s power, but because they thought it better for themselves. Likewise, as long as banknotes circulate in reality, there must be benefits to accepting banknotes which have no value in themselves and cannot be exchanged with anything else.

What then are the benefits? First, since Japanese banknotes have been accepted by everyone until yesterday, they should be accepted today as well. We do not have to think too much about whether they are good today or tomorrow, so we can save ourselves the effort of even thinking about it. Most of us usually have lots of issues we need to spend more time on, such as how to make money and spend it or how to make more money rather than bother with whether we should accept Japanese banknotes.
If we think or suspect too much about everything, we would find that our life has come to an end before we did anything. As a matter of fact, when we often act in our daily lives, we usually assume that the same things will happen next time round.

When we make an appointment with someone, for example, we assume she will show up since last time she came as promised. When we go out in a car, because there was no problem with the car up to yesterday, we assume it will be okay today as well. There are a number of examples like this around us. We make these judgments as a matter of custom. In doing so, however, we are able to behave and act regularly without thinking too much.

When many people act or behave out of custom, a kind of stable order, i.e., convention emerges spontaneously in a society, which will provides a framework for social activities. Our thinking is constrained and society becomes stable.

So, by believing that the familiar world will be the same today and tomorrow, continuous with the past, self-fulfilling ideas become self-fulfilling custom.

Believing and acting in a stationary state is not absurd in our world where time flows in one direction from the past to the present and the present to the future, but not vice versa. It is much better than wasting time all day just thinking and suspecting the worst. We can live like this, except in unusual situations, as long as there is stationary state in our world and it continues to be so.

Let’s suppose we live our lives believing a big earthquake won’t happen. It should not be a problem because a big earthquake doesn’t occur every day, except the day when a big one hits every once in a few decades. Unless it is possible to predict accurately when a big earthquake will happen, we would have to bear a huge cost believing the expectation of an earthquake and trying to evaluate its occurrence at long distance.

While most of us adopt such customary thinking, most people depend on it more than business people do. Even if there are minor changes between yesterday and today, by acting each day like any other day, we contribute to a regular state of society and economy.
The self-fulfillment of expectations

Those who think rationally rather than out of custom may find that such a way of thinking lacks rational reason. Economists, among others, might insist so. But they also might think as follows.

“I don’t recognize any value in Japanese banknotes. I don’t believe they will be accepted today just because they were yesterday. However, even if a ten thousand yen bill is just a piece of paper with no value, it makes sense to accept it as long as we can expect someone else to accept it as a ten thousand yen bill.” “If I can pass it on to someone else, the joker won’t lose me anything. If the person I give the bill to is rational enough like me, he should find it okay to accept the bill. And the person following that person, and also the person following the one following him should think the same way. If this continues indefinitely, everyone should accept the bill. Therefore, I will accept it,” and so on.

The rational person, therefore, should accept Japanese banknotes if he is patient enough to repeat the thought experiment indefinitely expecting the person following the person following…to do the right thing. This allows us to think of the future as eternally unchanging before coming back to the present. According to this logic, self-fulfilling ideas become self-fulfilling expectations.

If the thought experiment of the person following the person following the person etc. repeats itself only finitely, a different outcome will emerge. In an indefinite thought experiment, it is assumed there will be someone who accept the joker in the eternal future, while a finite thought experiment will reach an expectation that the person before the last person in the future won’t accept the bill because they won’t accept it. The logic will come back to the present and this person won’t accept it either.

Those whose expectations are based on rational thinking accept Japanese banknotes by introducing the idea of infinitely long thought experiment which even a computer cannot execute. They then deny the possibility of not having someone to accept the bill in the indefinite future. This is made possible by the fact that most people don’t know that “infinity” lies beyond human rationality.

Rational thinking also justifies accepting Japanese banknotes because infinity is irrational. This is typically found among business people, investors or speculators. Those who have rational
expectations of the future may become concerned about it whenever a little change occurs in the present. They encounter the present on the basis of a premise of a finite future. They then shift to the inverse rational expectation and stop accepting Japanese banknotes that they had previously accepted by way of self-fulfilling expectations. In this sense, rational expectations of the future amplify small changes or fluctuations and bring about economic instability by collapsing the regularity of reality into something approaching chaos.

**Reality is strong when built by expectations and custom**

Self-fulfilling ideas emerge as a synthetic effect of self-fulfilling custom and expectations. Japanese banknotes are accepted either because of ordinary people’s self-fulfilling custom or because of investors’ self-fulfilling expectations. Therefore, the “reality” formed through self-fulfilling ideas, a combination of self-fulfilling custom and expectations, is actually very strong and solid.

As long as the stabilizing effect of self-fulfilling custom is dominant, even if investors’ self-fulfilling expectations in response to minor changes or fluctuations works to de-stabilize the economy, the regularity of reality won’t easily collapse.

So even if you shout “a Japanese banknote is nothing more than a piece of paper” just like the child who claimed “the emperor is wearing nothing,” the banknote won’t lose value or stop circulating. More people may shout it more loudly, but as long as most people stay the same, nothing will change.

It is not the emperor goes naked because one ingenuous child yells. Each of them individually finds it strange but is unwilling to speak up, wondering what everyone else thinks. It is the situation in which everyone finds, triggered by a child, that everyone else does not see the clothes either, leading to the climax of the story. That is how the emperor gets naked.

“The Emperor’s New Clothes” does not describe how the child’s claim that “the emperor is wearing nothing” might spread beyond a threshold level. When many people shout out loud “Japanese banknotes have no value,” the structure of strong self-fulfilling ideas could break.
How might we understand, from the perspective of these two different forms of self-fulfillment -- custom and expectations -- the collapse of a structure of self-fulfilling ideas?

People believe that the great emperor wears them, so “invisible clothes” must exist. This is the essence of self-fulfilling custom. Some people know the emperor is wearing nothing, but they think it is better for them to believe the clothes exist, as long as many people appear to believe in “invisible clothes.” This is the self-fulfillment of expectations. Thus the self-fulfillment of an idea was accomplished and the emperor continued to march.

As an honest child’s shout (a small fluctuation) ripples through people, however, the self-fulfilling expectations of those who pretend to believe in the “invisible clothes” starts to break and eventually collapses. Then the supposedly solid self-fulfilling custom that ordinary people live by also starts collapsing through a threshold limit. The destabilizing effects of self-fulfilling expectations starts to work through fluctuations; and when it exceeds the stabilizing effect of self-fulfilling custom, the entire self-fulfilling idea will be destroyed.

If the same thing happened to Japanese banknotes, they would lose value significantly and could stop being accepted. A significant decrease in the value of money is called “hyperinflation” when prices soar. But even if hyperinflation occurs with a monopoly currency like the yen, it won’t lead to the collapse of money in general.

People would seek other forms of money than yen – world currencies like the dollar or an alternative money like gold or rice – or new kinds of money – e-money such as Bitcoin or community currencies. Market economy cannot exist without money. In other words, a certain self-fulfilling idea may collapse, but another version will survive.

Remember the emperor continued to march confidently even after the child pointed out loud that he was wearing nothing and the crowd followed him? It seems the emperor’s is another self-fulfilling idea that has survived.

In short, the central features of modern sovereign moneys seen in inconvertible IOUs of central banknotes can be depicted as “The Emperor's New Clothes” that correspond to the U.S. dollar and the Euro void of their own value. The image captures such characteristics of national currencies as
“self-fulfilling ideas” sustained by conventional inertia in custom based on daily experiences in the past, and by expectations of uncertain events in the future. Both ideas normally make money more acceptable and circulative so that its value can become more stable. However, if expectations of many speculators for the future turn very pessimistic, its value may become very unstable.

We thus describe the total story as the mixture if both self-fulfilling custom and expectations. The total story is summarized in Fig-4.

**Fig-4 Endurance of money as self-fulfillment of idea as custom and expectations**

The same logic of self-fulfillment of custom and expectations also applies to such other currencies as community currencies and crypto currencies including Bitcoin and Altcoins. The recent diffusion of those indicates that Hayek's idea of denationalization of money and concurrent currencies competing on quality of money has now become more relevant under current situations, rather than Marx/Menger’s commodity money and Keynes/Knapp’s credit money. Nevertheless, only inflation targeting related to quantity of money is currently pursued in quantitative easing (QE) conducted by central banks in developed countries. The quality of money refers not only to stable monetary values and low transaction costs, but also to high ability in creating, sharing, and communicating social and cultural value.

The potential of the logic of self-fulfillment of ideas can thus open up a new economic society when we realize that such various non-national currencies all depend on the same logic of money.

After 1973, money has discarded the property of commodity money because even the world hegemony money, US dollar, has no intrinsic value. And the ongoing diffusion of community
currencies and crypt currencies shows that modern moneys are not exclusively national issued by central banks. They can be non-national. Community currencies and crypt currencies are not based on individual credit/debit relations between participants as in conventional deposit money, but on trust in community as a collection of participants for the former or trust in network of users/miners for the latter. The fact partially negated chartalist theory of money insisting that money originated with states and credit/claim theory of money akin to it. Then how do we describe the basic property of modern money?

7. Conclusion

The evolutionary perspective of institution can give us, as the synthesis of what we have considered in the paper, a fundamental view on the evolution of money, particularly on its emergence, divergence, and self-fulfilling retention (Fig-5). Money is here conceived as the double-layered structure with the substructure with commodity/goods money and the superstructure with credit/claim money.

Modern money after 1970s prevailed on the upper-layer of superstructure of money as states or inter-states money in the form of cash or deposit money. But modern moneys diversified as new types of non-state money such as community and crypto currencies emerged and diffused on the upper layer of money in the developed and developing countries. Even if the superstructure of money may collapse for some reason such as meltdown of dominant modern moneys or fatal change of natural/social environments, the substructure of money may survive so money can evolve in a different direction once again.

From such a perspective, we can also shed light on a wider context of money in which we should pay attention to not only economic but also cultural and social dimensions. Money can thus be broadly considered as communication media including money and language.
Fig-5 Evolutionary dynamics of money: Loop process of emergence, endurance, variation and selection of replicator as money.

(2) Endurance of money: self-fulfillment of ideas as custom and expectations (modern superstructure)
   (a) Self-fulfillment of conventions
   (b) Self-realization/collapse of predictions

Relative frequency of a and b: \( w_1 \)

Relative frequency of a and b: \( w_2 \)

\( w_1 \) and \( w_2 \) determine stability/instability of money

State level

(3) Artificial variation (innovation) of monies, diversity of quality

(4) Selection of monies

(1) Emergence of money: imitation and learning of others’ wants
   (primitive subsystem)

Community level