Digital Currency: The Future Path or the Dead End for Financial Market

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Abstract: This article presents a model to represent the economy process of a global financial market which based on a digital currency (currency G) to optimize the strategy of constructing. In model preparation, we develop an index system to classify countries by their economy size and economy openness with the help of K-means, as the former one determines different type of relation between the growth of financial market and the development of economy, and the latter one is a vital indicator for a country's attitude towards global financial activities which can be inferred as their attitude to G. In model construction, we first derive parameters to determine how well G performs when serving as a global currency with the assumption adopted from Mundell-Fleming model. Then, by adopting Behavior Finance Theory, we develop an individual model using prospect theory to predict how G's features will influence people's decisions and a national model based on Endogenous Transaction Model to examine the relation between their legal trader and G. Finally, by building the VAR models with variables mentioned above, we merge our models into a fully integrated conformity with the same optimization target to facilitate the market's viability and utilize genetic algorithm to estimate it. In model analysis, we summarize the long-term effect of this market.

1. Introduction

1.1 Background

In an era where innovative payment network and new kinds of money is rising, the universal, decentralized, digital global currency has always been in the center of discussion both academically and mundanely, which also inevitably influences traditional currencies and the exist world banking system as well as international relations. However, lack in quantitative models of global financial system greatly harms the study of digital currency.

1.1.1 v2.0 Version of Libra Released by Facebook

On April 16, 2020, Facebook released the v2.0 version of Libra white paper and formally applied to FINMA for the license of Libra payment system. White paper v2.0 has changed the previous first version of the white paper, providing a stable currency anchoring a single legal currency while anchoring a basket of legal currencies. It has been challenged and opposed by all parties since the beginning. Among them, the doubts from the regulatory authorities are particularly strong. The US Financial Services Commission (FSC) believes that Libra is seeking to establish a new global financial system designed to compete with the US dollar. Although it has improved efficiency to some extent, there is still a problem of evading legal supervision. At the same time, the identification of the nature of Libra digital currency will also affect the regulation. With the previous Facebook data disclosure scandal, members of the house of Representatives believe that data privacy security and transparency of Libra users are still insufficient. In addition, they are concerned that Libra may help criminals engage in illegal activities, money laundering, crime and other acts. The governor of the Bank of England said that Libra must be perfect from the beginning, taking into account benchmark risk, rebalancing risk, basic asset management, anti-money laundering and counter-terrorism issues. France has set up a task force of G7 member countries on

digital currency and stable currency who believes that although Libra will bring innovation, it will also bring risks, which may cause serious global regulatory and systemic risks. However, these situations are not taken into account in the first white paper. In response to these questions and objections, Libra has released the v2.0 version of the white paper. It also hopes that it can be applied to more people on the basis of compliance.

1.1.2 Chinese Central Bank's Digital Currency (DC/EP)

On April 14, 2020, the Chinese central bank's digital currency (DC / EP) was transmitted online for internal measurement. The people's Bank of China's digital currency Research Institute said on the evening of the 17th that DC / EP is currently first tested in Shenzhen, Suzhou, xiong'an, Chengdu and the future Winter Olympics to optimize and improve its functions. DC/EP is a digital payment instrument with value characteristics and M0 attribute issued by the people's Bank of China. It belongs to legal currency and has legal compensation. No Chinese institution or individual can refuse DC / EP. Its functions and properties are exactly the same as paper money. It needs to download digital wallet for use, and it can also pay and trade offline. The release of Libra white paper v2.0 is also synchronized with the opening of DC / EP pilot, which may be a coincidence, but Libra is indeed facing pressure from the digital currency of the people's Bank of China.

In the future, the digital currency is in its infancy. Opportunities and risks it brings are also the problems regulators are facing. Therefore, the discussion of global currency is particular necessary.

1.2 Objective and Approaches

This paper aims to establish a financial market featuring decentralized, digital, global currency at individual, national and global to analyze its viability and effects to current banking systems and nation-based currencies. And our approaches as visualized as below.
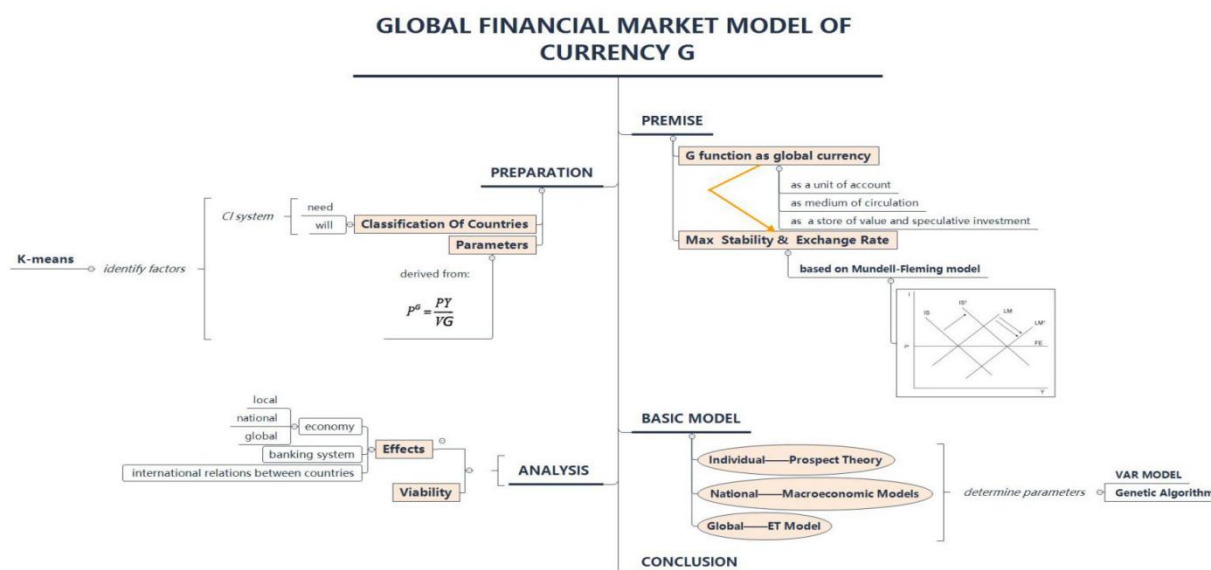

Figure 1 Global financial market model of currency G

2. Model Preparation

2.1 Premise

The functions of the global currency are the basis of the establishment of a global market. According to Cohen(1970) , there are three main functions of the global currency: medium of transactions, as instrumental currency in international and domestic trading, as well as foreign exchange transactions, it also be applied for intervening the foreign exchange market by official sectors; storage of value, which is used for international investment and storing properties by official sectors; unit of account, which is available as a charge unit in trading. And official sectors use it to identify the exchange rate. Above all, the function of medium in transactions is the most

crucial one, for it is intricately linked with currency value. According to the theory of the "Trilemma" or the "Impossible Trinity", in macroeconomic management, policy makers must face a trade-off of choosing two, not all, of the three policy choices: monetary independence, exchange rate stability, and financial openness. In addition to the theory of the "Trilemma", supply-demand relationship also decides that the stability of currency value is extremely important. To avoid inflation and stimulate consumption, price level should be control to fluctuation within a narrow range in a short term to achieve currency equilibrium that is M_s equals M_d, where Ms represents the supply of currencies, and M_d represents the demand of currencies.

2.2 Assumptions

We assume that the global political and economic environment is relatively stable that exogenous events like global heck attack or digital system breakdown will not be taken into consideration.

We assume that this global financial market is under no pressure or control of any sovereign states as it is a complete free market except for oversights from certain mechanisms.

We assume that this market co-exists with other global currency systems.

We assume that agents in the market are rational persons who act to suit their best interest.

We assume that the statistics we collected from the website are reliable and accurate as data used in our model is mainly collected from valid statistics websites of World Organizations, such as World Bank[1], International Monetary Fund[2].

2.3 Classification of Economy Country

Two of the most significant impact factors of currency value are price level and market size, which are respectively decided by national economic growth and openness of markets, by which different countries are influenced differently. Therefore, it is essential to class nations by them.

The first index is national economic growth. We refer the theory of Raymond W Goldsmith to analyze the correlation between financial development and economic growth caused by emphasis on economic progress. In his view, the level of storage and investment is crucial to the growth of economic. To raise the level, it is necessary to develop financial structure. Before the emergence of financial institutions and instruments, storage and investment are mixed. Once one decides to make investment, the investor must accumulate deposits to a certain extent before which there is not any profits as the deposits is basically private at this moment. The rise of financial activities separates storage and investment into two distinct and independent functions, which enhances the perception of capitals in GDP. There are two methods: First, financial instruments help the transform from storage to investment; Second, as financing intermediaries, financial institutions combine the function of storage and investment, people who are skilled but lack capital will attain money, less skilled people with abundant storage can achieve higher feedbacks, and the production size is therefore broadened while the output is therefore developed, eventually realizing economic growth.

The second index is openness of markets, which depends largely on trade openness. Trade openness is the optimization degree of the import and export of goods and services of a region or a country. With a high degree of trade openness, a country is more intricately connected with the international market. If world economy changes, it will also bring certain impact on the economy of the country. With a high degree of trade openness, economic development will be greatly affected. In the analysis of international trade, there are several factors to be considered.

Regional Economic Scale: Generally, regional economic integration will affect world prices, and the prices of production in the region will also be affected.

Industrial Structure: Openness not only expands export and improves the level of development, but also attracts high-quality foreign funded enterprises, which promotes improvement of management, technology of domestic enterprises and upgrading of industrial structure.

Purchasing Power: When trade is open and transaction costs are zero, the same goods are priced the same wherever they are sold. If there are price differences among countries, international trade in goods will occur until the price difference is eliminated and the trade stops, then the equilibrium state of the commodity market is reached.

Overall, due to different situation of development, different countries have different needs and

willing to make goals and strategies.

Figure 2 CI system

2.3.1 Economy Development Level

The Economy Development Level reflects an entity's economy size, which can be indicated by GNI, purchasing power parity gross national income (hereinafter referred to as PPNI), GDP, according to World Bank. We extract data from World Bank database, and 120 countries were selected as samples. Through Q-type Cluster Analysis, we establish a classification system to divide the counties into types. The similarity between samples is measured by the standardized Euclidean Metric, where d_j (i; i') is the distance between the i and i' variable and S2(xj) is a sample variance of the j variable[3].

$$D_N(i, i') = \sqrt{\sum_{j=1}^{p} d_j^2(i; i') / s^2(x_j)}$$

$$dj\ (i;\ i') = xij - xi'j,\ j = 1, 2, ..., p,$$

The distance between categories is based on group average method, where G1 and G2 imply two samples; n1 and n2 are the number of sample points in the two samples; xi and xj indicate the number i influencing factor and the j influencing factor of the 3 influencing factors respectively.

$$D(G_1, G_2) = \frac{1}{n1 \cdot n2} \sum_{x_i \in G_1} \sum_{xj \in G_2} d(x_i, x_j)$$

The result of the procedure of clusters' creation is graphically illustrated by means of a dendrogram in chart below. The countries can be divided into two categories. Analyzing the data gathered of China and United States, we figure out that they ranked high on the top of the list in terms of 3 index (GNI, GDP, PPNI).
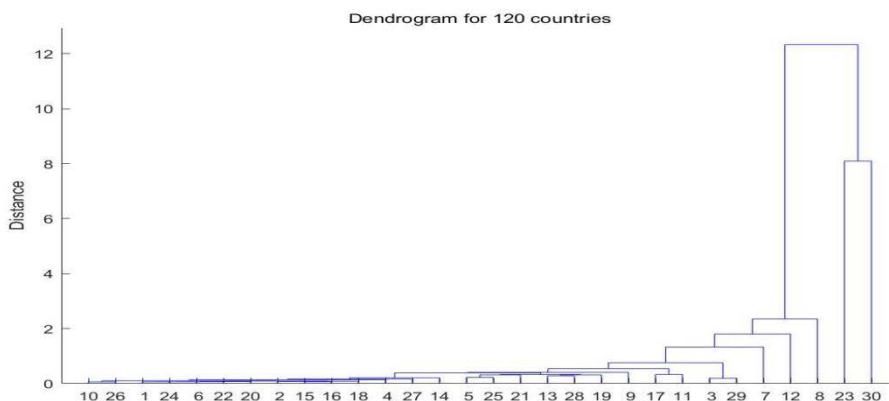

Figure 3 Dendrogram for 120 countries

2.3.2 Economy openness

A country's economy openness can furtherly be divided into indexes determined by rules and by results. We choose our indexes from the former ones due to their predictability and accessibility which serves better for our model. Furthermore, we choose 2 highly representative indexes, Trade Dependence Ratio (TDR) and KAOPEN Index, as our main parameters. The problem lies here is

the measurement of TDR. Its tradition formula only reveals the nominal value of TDR without taking the influence of a country's economy size and the inflation of domestic currency into consideration. Hence, we modified the origin formula to remove these influences, where E is the sum of exports and imports of goods and services; r is implied the PPP conversion rate; k is gross domestic product based on purchasing-power-parity (PPP) share of world total.

$$TDR = \frac{E}{GDP \cdot r} \cdot \frac{1}{1-k}$$

The Chinn-Ito index (KAOPEN) is an index was initially introduced in Chinn and Ito (Journal of Development Economics, 2006). KAOPEN. As for the index measuring a country's degree of capital account openness (KAOPEN), we gathered it directly from The Chinn-Ito Website which is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) [3].

$$cc = \alpha_1 + \alpha_2 \cdot TDR + \alpha_3 \cdot KAOPEN$$

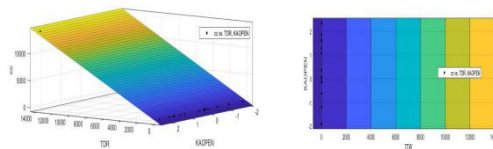Where cc indicates the comprehensive index of economy openness of the country.

Figure 4 The contribution of TDR and KAOPEN

Contribution of TDR and KAOPEN are calculated by Fitting. With cc=1 as watershed, we have:

$$cc = -0.408 + TDR + 0.3524 \cdot KAOPEN$$

When cc>1, there are 45 countries in total; When cc<1, there are 75 countries in total.

3. Model Building

Based on previous preparation, the G centered Global Financial Market model (G-GFM Model) can be constructed on the tradition market's framework with features of digital currency and arguments generated by goal of achieving the market's optimal viability.

3.1 Design and Structure

All markets feature the duality of microeconomy and macroeconomy, and this market is no exception. To properly represent it, three sub models are used to simulate different layers of the financial market. First, we adopt assumptions from Behavioral Finance Theory as basis to analyze the microeconomy. According to their different sets of behavior, individuals and countries are modeled separately by Prospect Theory and Endogenous Transaction Model, both of which clearly indicate that with G's deduction of transaction cost both individuals and countries are of high possibility to join the market. Although ET model also reveals the necessity of a country's legal trade, being forced to abandon their own currency can heavily impede most countries' willingness unless their openness index is at a risky high level. Then, instead of taking the conventional path to use dynamic stochastic general equilibrium (DSGE) models which generate even more hypotheses about the market, we use VAR model to formulate stochastic relations between variables concerning the price index of G currency that are selected to represent the whole market. Stability and high value of a currency are major factors facilitating the growth of its globalization. However, the larger the market scale is, the slower transaction velocity it has, which cuts down the market's allocative efficiency. Hence G's currency volume should be at a balanced rate to stabilize its price index. Finally, by using Genetic Algorithm to determine arguments used in models above with constraints from the premise, a dynamic model is built as an extension to predict long-term effects of this market. Due to the lack of real time statistics, we postpone this process in consideration of prudent

and only get a few estimates. The structure of our models is visualized as below:
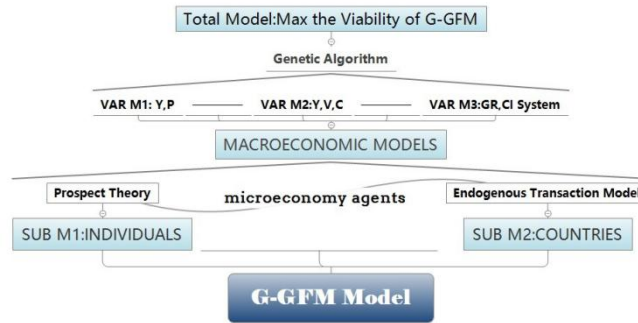

Figure 5 Total model: Max the Viability of G-GFM

3.2 Microeconomic Agents

In the wake of the Lucas critique, much of modern macroeconomic theories are built upon assumptions about micro-level behavior. Although we don't adopt classic models like DSGE Model, it is still vital for us to properly define behavior of agents in the market.

3.2.1 Individuals

Compared to the expected utility theory, the Prospect theory created in 1979 and developed in 1992 by Daniel Kahneman and Amos Tversky is a psychologically more accurate description of decision making. It assumes that people make decisions based on the potential value of losses and gains rather than the final outcome, and that people evaluate these losses and gains using some heuristics. In other words, the microeconomy agents in the markets are only partially rational. Its basic model is as followed.
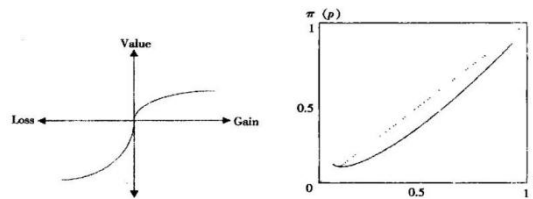

Figure 6 The Prospect theory

Where V is the overall or expected utility of the outcomes to the individual making the decision, x_1, x_2, ..., x_n are the potential outcomes; p_1, p_2,..., p_n are their respective probabilities; v is a function that assigns a value to an outcome. The value function is s-shaped and asymmetrical (as shown in table x). The function π is a probability weighting function and captures the idea that people tend to overreact to small probability events, but underreact to large probabilities.

As mentioned before, using digital currency has its benefit of deducting transaction cost along with its disadvantage of lacking price stability and responding measurements. Based on the model we can easily see that the increase of interest is not as promising as the insurance of not losing profit to people. Hence when improving the market planners should focus on how to stabilize the market more importantly the price index of G currency.

3.2.2 Countries

Compared with individuals, nations should be regarded as a macroscopic agent. Nevertheless, every nation is still microscopic entity. Additionally, for the national decisions are the consequences of group decisions, to regard countries as microscopic entities in the international market is more accordant with the assumption of rational man in economics than the individual fields. Therefore, we plan to simulate how nations make decisions in an international financial market centered on a universal, decentralized, digital currency using endogenous transaction model and the classification of nations[4].

The endogenous transaction model supposes T = t_1,t_2,...t_i is discrete, and t1. Also we define the the assemblage of economic actors as A = H_1,H_2,...Hi, while actors are divided into j types as the

sorts of goods produced, and every kind of H_1 actors produce goods g1, so the quantities of the types of goods are equal to j, which is the quantities of the types of actors. Next, we assume that goods can not be stored or separated, if the assemblage $G = g_1, g_2, ..., g_j$ is the assemblage of total goods, then the goods every actor longs to pursue is the subset of G, and for actors, the whole quantities of chosen goods types are the same while the mix of purchased commodities is different. Specially, we assume that every commodity purchased by every actor is unit 1, and the quantity of purchased commodity is n (n≤ j), then the consumption assemblage of every actor is $G = H_1, H_2, ..., H_n$. At the moment of t, as long as actors buy any commodity, the utility earned is U_t, the production cost of actors is C_t. It is supposed that there are two kinds of mediums of currency circulation in this financial system, one is the legal tender of one nation, another is the G currency. Totally distinct from goods and commodities, legal tenders and G currency are all storable, as well as inseparable. Let us suppose that the ratio of actors with legal tenders is m∈[0,1], while the ratio of actors with G currency is B∈[0,1]. Both of them are observable. But another point is that the history of actors is unobservable, so all the trading is anonymous. At the moment of t_i definition s_1 stands by the total economic level. At any moment, as soon as the economic level is given, the top priority that actors consider is matching. Once the matching is done, then it is turn to decide whether to do transaction or not. Let us suppose that actors holding money have to do purchase. Either goods or currencies are inseparable, which means after the matching between two actors is done, there are merely two possibilities, one is agreements after bargains, another is to exchange currencies and goods.

The whole process of transaction can be divided into two stages. The first stage is matching stage, the process of which can refer to the model of Corbae in 2003. The matching regulation is the function θ of economic level. The second stage is transaction stage where actors decide whether to make deals or not. Considering the equilibrium of the model, there may be four possible equilibrium situations between the legal tenders and G currency. The first is equilibrium of legal tenders, which reveals that actors can only receive legal tenders not Bitcoin. The second is equilibrium of G currency, which is contrary to the first one. The third is equilibrium of legal tenders and G currency where actors are willing to accept both of them. And the last one is non-monetary equilibrium. However, on account of the premise we have mentioned above, we only debate the third situation, which is the equilibrium of legal tenders and G currency. Moreover, the equilibrium of mere G currency is also considered. According to the process of matching and transaction, the ratio of the occurrence of transaction regarding currency is closely connected with the matching ratio between actors with G currency and without it. For the ratio of actors with legal tenders is M, and the ratio of actors with G currency is B, the rest actors without legal tenders and G currency is l-M-B, and we define a_0, m to identify the possibility that the match between actors with legal tenders and without currency, it is uncomplicated to know that $a_0, m = \min 1, \frac{M}{1-M-B}$. We then define a_0, b to identify the possibility that the match between actors without currency and with G currency, the result is that $a_0, b = \min 1, \frac{B}{1-M-B}$. In addition, the possibility between actors without currency and with G currency that they can not match is therefore $1-a_0, m-a_0, b$. On the contrary, am represents the possibility that the match between actors with legal tenders and without currency, $am = \min 1, \frac{1-M-B}{M}$. And ab represents the possibility that the match between actors with G currency and without currency, $ab = \min 1, \frac{1-M-B}{B}$. After entering transaction stage when finishing matching, the chance that transactions can be done is ρ, and if the transactions can be successful depends on whether actors without currency will receive currency for payment or not. It is supposed that π represents the chance that random economic man receives legal tenders in economic bodies, while θ represents the chance that random economic man receives G currency in economic bodies. Supposed that V_0 represents the value function of actors without currency, V_m represents the value function of actors with legal tenders, V_b represents the value function of actors with G currency. And r represents discount rate, sc_m and sc_b represent the storage cost of legal tenders and G currency separately. Based on value function, we can then deduce four different types of equilibrium condition. Then we can get the following equation:

$$rV_0 = (1 - a_{0,m} - a_{0,b})\rho^2(U - C) + \max_{\pi \in [0,1]} a_{0,m}\pi\rho(V_m - V_0 - C) + \max_{\theta \in [0,1]} a_{0,b}\theta\rho(V_b - V_0 - C)$$

$$rV_m = a_m\pi\rho(U + V_0 - V_m) - sc_m$$

$$rV_b = a_b\theta\rho(U + V_0 - V_b) - sc_b$$

3.3 Microeconomic Relations

According to parameters defined in premise that have direct link to the price index of G currency, we use VAR model to formulate the relations between the seven variables selected to represent the whole market and indexes from CI system. A standard VAR is as followed,where the observation Yt is called the lag of y; Dt is a time-invariant $k*k$ matrix; Γi is a $k*k$ matrix (for every i = 0, ..., p); ξt is a $k*1$ vector of error terms:

$$Y_t = \sum_{i=1}^{k} \Gamma_i Y_{t-i} + \Phi D_t + \varepsilon_t$$

With the total goal of making the market possible, the key variables should be factors influencing G's price index as we discussed above. Supposed G represents the total quantity of G currency in circulation, PG represents the exchange rate of G currency, then we can get the total supply of G currency:

$$M^s = P_G G$$
$$VG$$

Supposed transaction demand of G currency M1D indicated by denomination of American dollars meets Fisher Equation, P shows the price level relied on commodities and service, Y shows the economic scale of G currency, and V shows the circulation rate of G currency.

$$M_1^D = \frac{PY}{V}$$

The equilibrium between supply equation and the demand equation above identifies the relationship of price equilibrium. In the perfect market, the following equation reveals variables determining the exchange rate of G currency.

$$P^G = \frac{PY}{VG}$$

So far, we've determined six variables related to G. In addition to them, the cost of transaction should also be taken into consideration, as a key feature of digital currency.

3.4 VAR model

A standard VAR is as followed, where the observation Yt is called the lag of y; Di is a time-invariant $k*k$ matrix; Γi is a $k*k$ matrix (for every i = 0, ..., p); ξt is a $k*1$ vector of error terms:

$$Y_t = \sum_{i=1}^{k} \Gamma_i Y_{t-i} + \Phi D_t + \varepsilon_t$$

The only prior knowledge required is a list of variables which can be hypothesized to affect each other inter-temporally. Using the attached package of R, we can easily see the relativity between each variable.

Based on two sub models built above, the G centered Global Financial Market model (G-GFM Model) have been constructed. Meanwhile, the economic operational status can be predicted. We aim to find out the stable value of the G currency, which is the value of G currency under stable trading conditions, in terms of the predictions. The problem of finding the stable value of the G currency is deducted to an objective optimization,where R represents weights; P represents the value of the G currency; V represents the fluctuation rate of the global currency.

$$\max = R_{p_g} \bullet P_g + R_{v_g} \bullet V_g$$

The constraints of the objective optimization are described earlier in VAR model. Using Genetic Algorithm, we can find out the optimal result.

3.5 Supplement

Our model considers plenty of influencing factors. However, both macroeconomy and microeconomy have numerous aspects in real world. One crucial distinct is that digital currencies are less stable then traditional currencies due to the lack of the government regulations. Hence, establishing a stable global currency means to possess a more stable financial system. Its main effects are deduced as follow. For internationalization, the stability of currency value advances its international development mainly by market mechanism which exist in free markets to choose among production possibilities. After establishing a sound mechanism for international circulation of domestic currency, whether one nation's money is popular in global markets depends on its function as payment and store of value, which base its realization exactly on the stability of currency value. On the contrary, once certain currency of one nation shows an explicit devaluation trend, then the economic entities in global markets may not hold it as well as invest assets measured by it anymore, which means its internationalization process is greatly hampered. For the world banking system, at the moment, the main circulation capitals of world banks are in the form of American dollars, which means a unified currency is convenient for international transactions. As long as stable financial system is established, the world banking system will not be crushed by it. Additionally, supervision for the market mechanism is necessary. For national currencies, based on the analysis in 2.3, the tendency, the majorities of nations will not abandon their previous currencies, except those with too much external trading independence. Therefore, national currencies will not be shocked by G currency systems.

4. Conclusion

4.1 Weakness and Strength

There are two flaws in our model. Firstly, the real word is complicated, whereas the assumption we build up simplify the reality while establishing our model and these simplifications leave the model with some errors. Secondly, the data related to global digital currency is limited. As a consequence, some models are only theoretical inferences and require more data to test. And there are also merits. Firstly, our model creates an innovative index system to measure countries. Secondly, we adopt systematic analysis of financial market. Thirdly, we absorb many suitable and well-developed economic theory, such as the Trilemma theory, monetary theory, supply-demand relationship Theory, Prospect Theory, Endogenous Transaction Model and so on.

4.2 Trends and Expectations

4.2.1 Challenges

In the face of unprecedented uncertainty of coronavirus and economy, digital currency hasn't been giving positive response lately. Reduction in production and drastically dropped transaction are stirring up the turbulence in financial markets, let alone the lack of faith due to constantly unsettling news. Correspondingly, digital currency is facing the most horrifying devaluation ever since its appearance. Besides, the whole idea of global value chains will be reconsidered after coronavirus[5]. Different measures taken by the UK and China demonstrate how the crisis is changing global manufacturing chain. The UK lost valuable time early in the outbreak by not placing orders for necessary equipment and the lack of domestic manufacturing in the UK has meant no first-buyer privileges for the government to leverage, while China made 50% of the world's masks before the crisis and has expanded production 12-fold just to meet domestic demand. Moreover, strategies taken by the winners of globalization such as further global cooperation, carry profound risks in a crisis like the coronavirus pandemic. Therefore, countries will probably decide

on key strategic industries in which they need to be self-sufficient. Hence the main function of digital currency as tool for global transaction as mentioned above is under doubts as one of its premise, globalization process, is currently suspended and reconsidered.

4.2.2 Opportunities

However, there is still much to look forward to about the prospects of digital currency. Firstly, the devaluation of cryptocurrency has already been slowing down and is likely to cease in the foreseeable future. Bitcoin price has exhibits renewed strength by edging higher towards $8k levels. And some predicts that further upside traction for the bitcoin price to retest $9,000-10,000 areas in the next quite a few weeks to come[6]. Secondly, technologies on which digital currency relies have been innovated and renewed with new purposes. For an instance, with an objective of assisting recovery efforts in the wake of the pandemic Covid-19, IBM has come up with the innovative blockchain network called "Rapid Supplier Connect", which helps from the digital authentication services to streamline supplier vetting, and rendering service to emergency supplier on-boarding. Other than that, the European Central Bank (ECB) is exploring ways through which it can develop its payments infrastructure while maintaining the social distancing and is evaluating solutions with the help of blockchain technology and its pros & cons. ECB noted that the system could handle 2,000 transactions.Therefore, digital currency can still be trusted as the future path for financial markets as our model demonstrated.

4.2.3 Digital Currency as the Future Path

According to consultancy firm PwC's Global Consumer Insights Survey 2019, the number of people making mobile payments in the Middle East grew by 20 percentage points, to 45 percent. Globally, 34 percent of consumers paid for purchases using mobile payment in stores, up from 24 percent a year earlier. In addition, China leads the pack with 86 percent of its population tapping mobile payments, followed by Thailand at 67 percent[7]. As mentioned in the background, while most of the countries are trying to launch plans of promoting a national digital currency, China has already taken the first step to realize such plans. As the pioneer in embracing the cashless revolution, China is a vivid example of our model and has shown some promising feedbacks. We will continue our research with data from China's practice and hopefully can reveal the role of digital currency in the future of financial markets.

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