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THE TRUE CAUSE OF BUSINESS CYCLE

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ABSTRACT

Cause and impulse are different. Cause creates an economic mechanism in which impulses propagate effect. If we remove cause, impulses propagate nothing. In credit economy, I derive an economic mechanism from economic agents' budget constraint interactively in which effects arising from impulses are co-movement. This economic mechanism does not exist in non-credit economy while all impulses are active. Thus, loan is the true cause of business cycle. Business cycle is inherent in credit economy. If we remove loan from the world we live in, we eliminate business cycle completely and permanently.

JEL CLASSIFICATION & KEYWORDS

■ E32 ■ Business Cycle ■ Cause ■ Credit Cycle

INTRODUCTION

Business cycle is such a complicate phenomenon that the business cycle theory constructed in this paper involves many independent ideas, which will be interactively organized together. I divide those independent ideas into three categories. The first category is general methodology. Second, I clarify the concept of cause. Third, I show how to build a model to identify the cause of business cycle, based on general methodology and the concept of cause.

General methodology

Friedman [1953] argued that it is a good economic theory if an economic theory, in which no matter whatever unrealistic assumptions economists make, can predict what will happen reasonably well. Friedman's methodology is unsound and incomplete because Friedman ignored the possibility that we may derive true conclusions from false premises. For example, if I assume that sun rotates around earth from east to west, then I can predict that sun rises from east and sun sets at west perfectly. Obviously, it is a false theory with true conclusion. Thus, economists have to reject those economic theories which contains false premise as sun rotates earth. Since Friedman did not require that premise should be true, Friedman's methodology cannot distinguish true economic theories from false economic theories. That is the reason why there are many economic theories, which co-exist, to explain the same phenomenon, e.g., business cycle theories, equally well. Once economist get rid of Friedman's methodology and apply true premise to construct an economic theory, economist can release from mess created by economic theories which are based on false premise. To summary, the true economic theory must consist of both true premises and true conclusions.

As the possibility discussed above that there would be many theories to explain the same effect equally well, there are too many causes of business cycle to be true. Keynesian economics takes investment shock to be the cause of business cycle. Technology shock is the cause of business cycle in Real Business Cycle (RBC) theory. Monetary school believes that monetary disturbance is the cause of business cycle. The discrepancy between natural rate of interest and actual interest rate causes business cycle in credit cycle theory. Sun spot, inventory fluctuation and asset price are also on the list of cause of business cycle. Are these causes of business cycle listed above all true? Are these causes of business cycle listed above all false? Otherwise, which one is true and which one is false? Is there a method to identify the true cause of business cycle? Unfortunately, most economists either have not cognized those questions or have not tried to answer those questions yet. In other words, most economists do not realize that economists cannot help identify the true cause of business cycle before they overcome business cycle.

Under this circumstance, some economists are not pleased by all business cycle theories they have ever known. Fuhrer and Schuh [1998] summarized the conference of the Federal Reserve Bank of Boston in 1998. The title of their paper is "Beyond Shocks: What Causes Business Cycles? An Overview." Fuhrer and Schuh doubted that shock is the satisfactory answer for business cycle while shock is the main stream framework to analyze business cycle. Fuhrer and Schuh were not able to tell us which factor is the true cause of business cycle. Moreover, they seems to accept the idea that business cycle is multi-causes. But they omitted the key issue that there must be an undiscovered common factor (i.e., true cause) among different objects (i.e., impulses) when different objects produce the same effect. The undiscovered common factor usually is the true cause. It implies that "causes of business cycle listed above" will not produce any effect by itself if the undiscovered common factor is removed. The purpose of this paper is to derive the undiscovered common factor (i.e., the true cause) of business cycle from true premises.

Cause and impulse

Fuhrer and Schuh also mentioned that the concept of cause is ambiguous in business cycle theory. The plague is an excellent example to illuminate the ambiguity. Virus is the cause of the plague. Flea propagates the plague because flea transmits virus from rats to human beings. When we apply quantitative analysis to study the plague, number of rats and number of flea are positive correlated to the scale of the plague. It would lead us to conclude that both rats and flea cause the plague rather than propagate the plague. As Frisch [1933] distinguished impulse from propagation, I distinct cause from impulse. Cause constructs a mechanism in which impulses propagate effects. If we remove cause (e.g., virus) but keep impulses (e.g., flea and rat), impulses cannot propagate anything. Notice that, reviewing last section, cause corresponds to the undiscovered common factor and impulse corresponds to objects. I will demonstrate that "causes of business cycle listed above" are impulses later on.

Modeling

Lucas [1980] addressed that a theoretical model not only mimics the real world but also allows us to practice artificial experiments. What does "mimics the real world" mean? It means economists have to make unrealistic assumptions in order to reduce the real world, which is too complicate to handle, to such a simple situation that economist can start to analyze or practice artificial experiment. It raises a question. What kind unrealistic assumption is a false premise and what kind unrealistic assumption is a true

premise? In scientific works, true premise means a fact we have observed. If an object we assume has never existed (e.g., ether), this object is false premise. For example, I shall discuss business cycle in a two-person barter economy. Barter economy is unrealistic because we live in monetary economy. But barter economy had prevailed in ancient time. Barter economy is a true premise although barter economy is an unrealistic assumption. Perfect foresight is a false premise because perfect foresight has never existed. If economists build an economic theory on perfect foresight to explain what happened in the real world well, economists construct a false theory with prediction power. Notice that perfect foresight has explanatory power. Explanatory power means that we derive conclusions from a particular premise. Those conclusions cannot be proved if the particular promise is dropped. For example, economic agents will not increase production while they foresee that changes in prices will be inflation, not changes in relative prices. Perfect foresight proves that Phillips curve is always vertical. If perfect foresight is dropped, Phillips curve would have negative slope. Besides, the two-person assumption is also unrealistic. But the two-person assumption is just a description without explanatory power because I will extend the model to be a many-persons barter economy and keep all conclusions intact. If an unrealistic assumption is descriptive, it will be treated as a true premise.

Besides descriptively unrealistic assumptions, I only apply supply-demand and budget constraint, which are facts with explanatory power, to be true premises in this paper. Budget constraint is an identity no matter what kind inter-temporal decision economic agents make and no matter what kind technology economic agents apply to produce output. Therefore, I do not need to make any assumption about economic agents' activities, e.g., constant scale production function, in this paper. It coincides with Hayek [1933] in which he advocated business cycle theory should be built on elementary economic ideas only. In addition, conclusions that are derived from budget constraint and supply-demand are true deductive theories. It is wrong to interpret equations in the rest of this paper to be assertions that I insist personally.

As the case of the plague, we can practice three artificial experiments to identify the cause of the plague. First, we inject virus to human beings while rats and flea are quarantined. Second, we let people live with rats which are not infected by virus. Third, we let people live with flea which does not carry virus. That is, the method of this paper is to isolate an economic factor so as to practice artificial experiments to demonstrate that the isolated economic factor is the common factor (i.e., cause) or objects (i.e., impulses).

Actually, I remove the economic factor, which I believe is the true cause of business cycle, from the economic system we live in. In other words, I reduce the real world to an artificial economic system for experiments. Then I introduce "causes of business cycle listed above" into the artificial economic system. If "causes of business cycle listed above" propagate nothing in the artificial economic system, they are not the true cause of business cycle. If "causes of business cycle listed above" do propagate business cycle in the economic system we live in, the removed economic factor is the true cause (i.e., common factor) of business cycle.

I will practice three artificial experiments. Since we are live in loan-monetary economy and monetary disturbance would be an impulse, I start from pure barter economy. First, I will show that there is no business cycle in pure barter economy. Second, I will demonstrate that there is no business cycle in pure monetary economy. Finally, I introduce loan into pure barter economy. Loan creates a mechanism in which all impulses of business cycle are allowed to propagate business cycle. Thus, I conclude that loan is the true cause (i.e., undiscovered common factor) of business cycle.

Reduction and approach

Lucas [1977] addressed that co-movement and persistence are two essential characteristics of business cycle. Lucas and Sargent [1978] argued that propagation mechanism transforms impulse into persistence. As Lucas and Sargent, propagation mechanism converts co-movement into persistence. In case that both investment market and consumption market are in excess supply in current period due to co-movement, production of consumption goods and investment expenditure decline. It leads to decrease in income of input factor and then consumption will decline further. Consequently, both investment and consumption will be in excess supply (i.e., general excess supply) in the next period. Thus, the current general excess supply will propagate continuously general excess supply in the future. General excess supply produces recession. Similarly, general excess demand propagates boom. Thus, essential characteristics of business cycle that I have to explain are reduced to general excess demand and general excess supply (i.e., co-movement) only. If I identity the true cause of co-movement at a point in time, then the true cause of business cycle is identified.

The approach of this paper is microeconomic because an aggregated phenomenon would be analogous to the corresponding phenomenon derived from economic agent. For example, Ting [2009] demonstrated aggregated growth and the growth of the firm are analogous when firms pursue maximum return rate on capital. That is, co-movement is supposed to occur between two economic agents. As the example in the last paragraph, co-movement is converted into a statement that all markets are in excess supply or all markets in excess demand. If I can demonstrate that this statement is valid between two persons, it will be helpful to handle the case of many persons. That is the reason why I start to analyze the cause of co-movement from a two-person barter economy.

The qualitative approach above contrasts to contemporary quantitative approach. As Rebelo [2005] pointed out, the new idea of Kydland and Prescott [1982] is beyond the qualitative comparison of model properties with stylized facts. RBC theory uses typical economic agents to represent the real world. If RBC is correct, it implies that there is business cycle in the Robinson Crusoe economy. Thus, the idle labor force is leisure, not unemployment, and drop in output is inter-temporal resources allocation. Robinson Crusoe does not suffer from business cycle because he is always in equilibrium. This conclusion is against facts because business cycle is a phenomenon of market disequilibrium, e.g., unemployment is excess supply of labor and general gluts are excess supply of goods. To summary, like the example of the plague, quantitative analysis may not be able to identify the true cause of business cycle because quantitative analysis concerns propagation only.

Organization

This paper is organized as follow. In section 2, I demonstrate that there is no business cycle in pure barter economy. In section 3, I derive an economic mechanism from economics agents' budget constraint interactively in which all major economic sectors are co-movement. In section 4, I investigate extra implications of the economic mechanism I discover. First, it suggests a new method to identify turning point. Second, it explains why quantity theory of money is supported by empirical studies to explain business cycle.

If a model imitates the real world completely, this model should explain more characteristics of business cycle than persistence and co-movement. It hints a criterion to judge an economic model: the more an economic model can explain; the better this economic model is. In section 5, I briefly discuss three topics beyond co-movement. First, why is Phillip curve wrong? Second, why business cycle is international? Since income is composed of consumption, saving and investment and business cycle is income fluctuation, the true cause of business cycle and Keynesian economics are supposed to be harmonious. Third, is saving-investment approach compatible with this paper?

Since both credit cycle theory and this paper conclude that loan is the cause of business cycle, economists may declare that this paper would be based on Austrian business cycle theory rather than a brand new idea. I point out the difference between this paper and Austrian business cycle theory in section 6. Finally, I summarize this paper.

Pure barter economy

Lucas [1977] pointed out that broadly defined sectors are rising together and falling together, i.e., co-movement. The model in this section, therefore, contains two broadly defined sectors, consumption and investment. I make following assumptions to describe the case I consider.

(1) There are two persons, A and B, who are self-employee.

(2) Person A produces an investment well, I.

(3) Person B produces a consumption well, C.

(4) There is no market to exchange assets.

(5) There is no money.

Person A's budget constraint is

$$I^s_{a\,t} = C^d_{a\,t} + P I^d_{a\,t} \tag{1}$$

Let superscript d be demand and superscript s be supply. Subscript a and t are person A and time respectively. P is relative price of investment goods while the price of consumption goods is one. $I^s_{a,t}$ represents person A's planned income accruing from his own production as well as supply of investment goods. $C^d_{a,t}$ is person A's planned consumption, i.e., demand for consumption goods. $I^d_{a,t}$ is not only person A's demand for investment goods but also person A's planned saving. Since there is no market to exchange assets, assets does not appear in any person's budget constraint.

Person B's budget constraint is

$$C^s_{b\,t} = C^d_{b\,t} + P I^d_{b\,t} \tag{2}$$

By adding equation (1) and (2) together, we get

$$\left(I^s_{a\,t} - I^d_{a\,t} - I^d_{b\,t}\right) + \left(C^s_{b\,t} - C^d_{a\,t} - C^d_{b\,t}\right) = 0 \tag{3}$$

I propose to name equation (3) to be market interdependence because equation (3) describes inter-market disequilibria. In this two-person barter economy, $C^s_{(b,t)}$ is total supply of consumption goods, C^S. $C^d_{a,t} + C^d_{b,t}$ is total demand for consumption goods, C^d. By aggregating so,

$$Y^S = C^S + PI^S \tag{4}$$

$$Y^d = C^d + PI^d \tag{5}$$

$$P(I^S - I^d) + (C^S - C^d) = (Y^S - Y^d) = 0 \tag{6}$$

Y, C and I are aggregate income, aggregate consumption and aggregate investment. I will discuss the meaning of equation (4) and (5) in section 5. It is very easy to generalize the model presented above. First, we introduce N goods into budget constraints of economic agents, i.e., equation (1) and equation (2). Second, we introduce M economic agents into the model. Then, we add all budget constraints together to get an aggregate market interdependence as general as Keynesian economics does, e.g. equation (4), (5) and (6). The crucial issue is that the form of the aggregated market interdependence is independent of the number of persons and the number of goods.

Equation (3) and (6) mean investment and consumption moves oppositely in pure barter economy while markets are in disequilibrium simultaneously (i.e., excess demand for investment goods implies excess supply of consumption goods and vice versa). This conclusion is against the essential characteristic of business cycle that investment and consumption are positively correlated, i.e., co-movement. Moreover, the level of aggregate income is fixed because total supply is always equal to total demand, i.e., equation (6). In other words, pure barter economy will restore equilibrium automatically no matter whatever shock disturbs markets. Fluctuation is resources reallocation process, not changes in output level. Thus, business cycle does not exist in pure barter economy.

Now I move forward to pure monetary economy. I make assumption (6) to replace assumption (5) now.

(6) Consumption good is the commodity money.

Assumption (6) does not change any equation. Thus, consumption, saving, investment, and other shocks do not cause co-movement in pure monetary economy.

Credit economy

I make following extra assumptions to describe the case of the credit economy I think over.

(7) Person A plans to borrow from person B for extra investment.

(8) Person B plans to save embodied by lending in order to reduce storage cost.

(9) Person A pays interest at the end of current period.

The budget constraints of person A and person B are

$$I^s_{a,t} + L^d_{a,t} = C^d_{a,t} + PI^d_{a.t} + rL^d_{a,t} \tag{7}$$

$$C^s_{b,t} + rL^s_{b,t} = C^d_{b,t} + PI^d_{b,t} + L^s_{b,t} \tag{8}$$

L is loan and r is interest rate. $L^d_{a,t}$ is person A's planned borrowing (i.e., demand for loan) and $rL^d_{a,t}$ is person A's payment of interest. Equation (7) is person A's budget constraint based on assumption (1), (2), (4), (6), (7) and (9).

In equation (8), $L^s_{b,t}$ represents person B's supply of loan as well as part of his planned saving. $rL^s_{b,t}$ is person B's interest revenue. By adding equation (7) to equation (8), I get a another market interdependence

$$[(C^s_{b,t} - C^d_{a,t} - C^d_{b,t}) + P(I^s_{a,t} - I^d_{a,t} - I^d_{b,t})] + (1-r)(L^d_{a,t} - L^s_{b,t}) = 0 \tag{9}$$

$$[(C^s - C^d) + P(I^s - I^d)] + (1-r)(L^d - L^s) = 0 \tag{10}$$

$$\left(Y^s - Y^d\right) + (1-r)\left(L^d - L^s\right) = 0 \tag{11}$$

In equation (9) and (10), consumption, investment and loan are allowed to be in excess demand simultaneously so that they rise together. Of course, these three sectors could be in excess supply simultaneously if shocks occur. Equation (9), (10) and (11) implies co-movement.

I turn to discuss input factors. Person A provides his own labor and capital for production because he is self-employee. Thus, $I^s_{a,t}$ is person A's planned factor income. Similarly, demand for input factors is derived demand (i.e., derived from outputs) in microeconomics.

$$PI^s_{a,t} = wN^s_{a,t} + \gamma K^s_{a,t} \quad (12)$$

$$P(I^d_{a,t} + I^d_{b,t}) = wN^d_{a,t} + \gamma K^d_{a,t} \quad (13)$$

Where w, γ, N and K are wage rate, profit rate, labor and capital respectively. Consequently, equation (10) and equation (11) are transformed into

$$w\left[\left(N^s_{a,t} - N^d_{a,t}\right) + \left(N^s_{b,t} - N^d_{b,t}\right)\right] + \gamma\left[\left(K^s_{a,t} - K^d_{a,t}\right) + \left(K^s_{b,t} - K^d_{b,t}\right)\right] + (1-r)\left(L^d - L^s\right) = 0 \quad (14)$$

$$w(N^s - N^d) + \gamma(K^s - K^d) + (1-r)(L^d - L^s) = 0 \quad (15)$$

Thus, labor, capital utilization, loan, wage rate, profit rate and interest rate are co-movement in addition to consumption, saving and investment. The development of market interdependence is completed.

Market interdependence

Turning point

In equation (10), it is possible that consumption sector is in excess supply while investment sector is in excess demand, and vice versa. For example, supply of aggregate income is greater than demand for aggregate income and supply of loan is greater than demand for loan, when excess supply in investment sector is greater than excess demand in consumption sector. It implies an exception during business cycle: negative correlations and positive correlation co-exist. I predict this co-existence would transitorily occur at the turning point of business cycle rather than recession and boom. It also suggests a hypothesis that the correlation between aggregate income and interest rate (i.e., aggregate income and loan) is higher than correlations between investment and interest rate, consumption and interest rate, aggregate income and investment, and aggregate income and consumption.

Demand deposit

Deposit is loan (i.e., depositors lend their own money to commercial banks). Since the most popular definition of money includes demand deposit, aggregated impact arising from "monetary disturbance" (i.e., $(1-r)(L^d-L^s)$) is equivalent to impact arising from other impulses on aggregate income. It theoretically explains Sims [1972] who argued that monetary disturbance causes income fluctuation and why quantity theory of money becomes a business cycle theory that applies a single factor to analyze and predict business cycle successfully. Arguments above hint a testing hypothesis. We make a simple regression that aggregate income is dependent variable and loan (e.g., demand deposit) is independent variable. If we introduce another independent variable (e.g., technology shocks) into the regression, this additional independent variable should be insignificant.

What else the market interdependence can do

Phillips curve

Phillips curve is a negative correlation between inflation rate and unemployment rate. This negative correlation is interpreted to be the trade-off between inflation and unemployment by Keynesian economics. We know the data that generates Phillips curve arises from business cycle. As I argued above, business cycle is a phenomenon of market disequilibrium with co-movements like prices and employment. Co-movement implies a negative correlation between inflation and unemployment, which is exactly the same as Phillips curve. Market disequilibrium suggests that economy will deviate away from the status we observe sooner or later. In other words, every point on the negative correlation between inflation and unemployment cannot sustain itself as stationary equilibrium does. That is, economists misinterpret unstable co-movement to be a stable trade-off. Neither natural rate of unemployment hypothesis nor rational expectation is necessary while I deny the trade-off suggested by Phillips curve.

Business cycle is international

The model I developed in section 2 and 3 is the same as the standard two goods by two countries model in the pure theory of international trade. We can imagine that person A and person B are living in different countries so that business cycle occurs internationally. As international trade and international finance progress (i.e., the case of N goods and M persons), I predict that business cycle is global. In addition, this model also highlights how trade deficit is financed by borrowing from foreign countries.

Saving and investment

Patinkin [1976, Chapter 9] affirmed that "aggregate supply price" and "aggregate demand price" in Keynes [1936□chapter 3] means aggregate income defined from supply side and demand side respectively. But Keynes did not well develop this idea about aggregate income. Y^s and Y^d corresponds to "aggregate supply price" and "aggregate demand price" respectively. I define saving to be $S=Y^s-C^d$ in this paper because Y^s is planned factor income that households expect to earn and C^d is planned consumption expenditure that households intend to spend. When households save real goods (e.g., automobile and cloth), saving becomes "demand for goods." That is, $S=I^d$. Thus, $Y^s=Y^d$, which is the case that I drop loan from equation (6). Since saving is always equal investment in an economy without loan, Keynesian business cycle theory is invalid in a non-credit economy.

Factor income accrues from production. When households decide to embody their saving by lending, households do not use the purchasing power arising from production to buy anything. Saving becomes "supply of goods and supply of loan" and "demand for nothing." When investors plan to borrow, they supply nothing but they demand for real goods and loan. There is no way to guarantee that saving is always equal to investment. Thus, business cycle becomes possible. Loan is the necessary condition for the validity of Keynesian economics.

Credit cycle theory

Since both credit cycle theory and this paper argue are similar, economists may not recognize that this paper is completely different from credit cycle theory. What method do Austrian economists apply to identify the cause of business cycle? Hayek [1933] mentioned that economists have to put their business cycle theories into different economic structures for testing cause of business cycle as I did in section 2 and 3. But Hayek [1933, p. 45] wrote

> in a barter economy, interest forms a sufficient regulator…in the absence of money, interest would effectively prevent any excessive extension of the production of production goods…disproportional developments in the production of capital goods can arise only through the independence of the supply of free money capital from the accumulation of saving,

Again, Hayek [1933, p. 51] stated

> Automatic adjustment of supply and demand can only be disturbed when money is introduced into the economic system.

In Hayek's mind, there is no business cycle in the loan-barter economy because interest rate is the price for loan and

Hayek argued that interest rate prevents us from business cycle. Following Hayek's arguments, natural rate must be equal to interest rate in a loan-barter economy. But Hayek did not tell us why. In case that technology shocks occur in loan-barter economy, technology shocks increase productivity and then raise natural rate. Thus technology shocks propagate business cycle due to the discrepancy between natural rate and interest rate. This paper objects to Hayek's arguments that business cycle does not exist in loan-barter economy.

Hayek's inference is in question because he misunderstood the role of price in economic theory. Price makes supply equal to demand given supply curve and demand curve. When co-movement occurs, markets are in disequilibria. The assumption that other things are given is violated. It means supply curve and demand curve shift to new positions. When supply curve and demand curve stop shifting, the automatic adjustment, produced by prices and interest rate, starts to work. In short, business cycle refers to shifting of supply curve and demand curve (e.g., change in natural rate due to new technology) so that automatic adjustment produced by prices and interest rate cannot bring economy back to prosperity. Note that, in the pure barter economy discussed in section 2, the level of aggregate income is fixed (i.e., aggregate supply curve and aggregate demand curve are given). I, therefore, argued that automatic adjustment will restore equilibrium.

Since Hayek argued that loan does not cause business cycle in loan-barter economy, he stated money is the cause of business cycle. I have to remind readers that Hayek meant both currency and demand deposit when Hayek mentioned money. Further, Hayek blamed credit creation (i.e., creation of demand deposit or creation of money) for producing the discrepancy between natural rate and interest rate. Money creation becomes the cause of business cycle. Since money creation (i.e., demand deposit) is a special type of loan mechanism and Hayek argued that loan is not the cause of business cycle, Hayek is self-contradictory. In short, Hayek did not analyze the substance of loan as this paper does but focused on propagation produced by money (demand deposit) creation as well as Hayek did not test his business cycle theory in a pure currency regime in which there is no credit creation and no loan. Since Hayek counted demand deposit as money and amount of demand deposit depends on credit creation, Hayek reached the false conclusion that money (i.e., credit creation) is the cause of business cycle. Notice that I do not depend on credit creation in this paper.

As I argued in the beginning of this paper that different premises may lead to the same conclusion, I have to point out that premises of this paper are different from credit cycle theory. The explanatory premises of this paper are supply-demand and budget constraint while co-movement propagates persistence. Credit cycle theory applies credit creation to propagate business cycle while natural rate is explanatory premises for fluctuations. Thus, credit cycle theory and this paper are independent each other.

Besides, credit cycle theory did not distinguish cause from impulse, too. Since all business cycle theories listed in section 1 are impulse type business cycle theory, credit cycle theory is not compatible with other business cycle theory. But this paper is compatible with other business cycle theories, e.g., Keynes' investment-saving approach and quantitative theory of money.

Summary

Arnold [2002] classified post-war business cycle theories into five schools: Keynesian economics, monetarism, new classical economics, real business cycle and new Keynesian economics. Those five schools are all talking about business cycle propagation. Credit cycle theory (e.g., Kiyotaki and Moore [1997] and Victoria and David [2010]) considers propagation, either. But it is not very clear how loan co-operates impulses to propagate business cycles in those schools' framework. That is the reason why I figure out that loan is the necessary condition for Keynesian economics and demand deposit is loan for monetarism. It is for those economists, who use data to propagate business cycle successfully, that they do not realize all available data are generated from credit economy and they, therefore, cannot apply any empirical study to deny the conclusion of this paper: loan is the true cause of business cycle.

Since loan is the true cause of business cycle, business cycle is inherent in the economy that we live in. To remove loan from the current economy is the only policy to protect us from business cycle completely and eternally. But this policy seems to be impractical because it destroys efficiency of resources allocation by interest rate. Stabilization policy still has a long way to go.

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