TRAP OF ECONOMICS THE WORLD HAS FALLEN IN A SURVEY OF KINOSHITA THEORY IN MACRO-ECONOMICS

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Abstract

This paper is a survey of Kinoshita's Macro-Economic theory and new Macro-Economic paradigm. Throughout his study, he proclaims there are two economic phases: one is expressed primal problem, and another is expressed its dual problem. And he states that the two economic phases have duality relations. His theory reaches analysis of global trade, bubble economy and its crash. His main tools for the analysis are linear programing on operations research. We summarize his five published papers which construct his theory and paradigm, and we point out that ignorance of his theory makes the world economy fall in trap of economics.

Keywords: Macro-Economics, bubble economy, global trade, thetical and antithetical economics

Introduction

This paper is a survey of Kinoshita theory[1)-5)] on Macro-Economics and explains Kinoshita's new Macro-Economics paradigm, Primal problem and Dual problem.

Primal and Dual problems in Macro-Economics

Kinoshita[1)] proclaimed two different phases exist in Macro-Economics and classified into the primal problem and the dual problem. In the primal problem phase, capital expenditures of private corporations grow, and corporations have an impetus towards the maximization of profits; the economy grows. During the bubble period collapses and into the dual problem phase in Macro-Economics, the efficiency of investment drops below the market interest rate for corporations with debt, and the goal of corporations shifts from maximization of profit to minimization of debt; the economy to shrinks. In Figure 1, we indicate corporate behavior in these two phases.

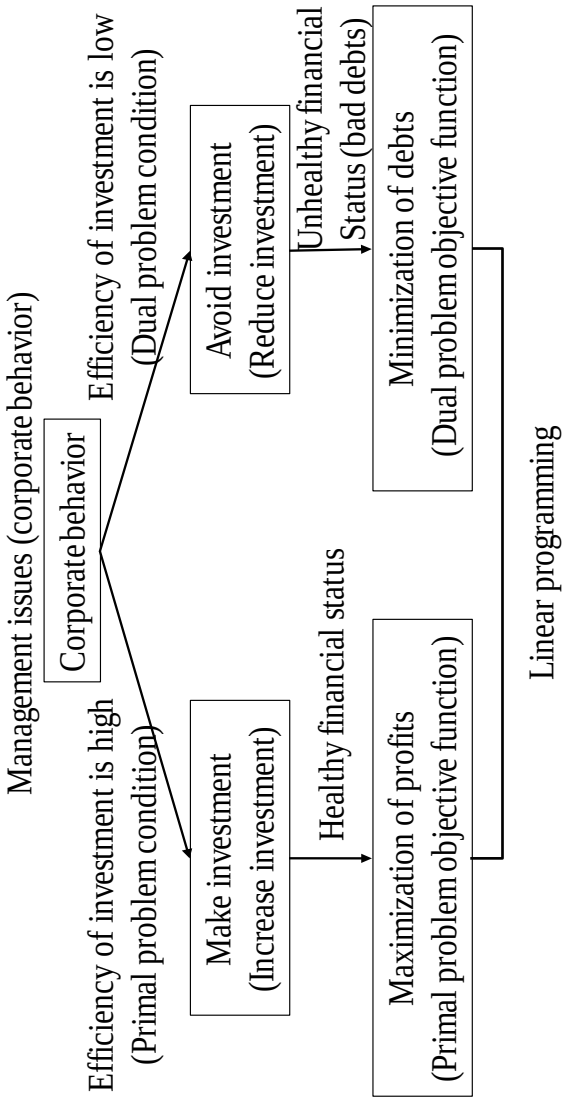

Figure 1 Corporate behavior(Kinoshita[1)], p117)

Primal Problem

Kinoshita[1)] calls Adam Smith type economics *the primal problem in Macro-Economics*. In the primal problem, economic behavior is to maximize profits, and they are expressed by an objective function that is a formula for the primal problem of linear programming (equation (1)). In other words, an economic entity will behave in such a way as to maximize profit, which is expressed by the objective function under various conditions.

Formulation of the primal problem:

$$\max \sum_{j=1}^{n} c_j x_j \tag{1}$$

subject to:

$$\sum_{j=1}^{n} a_{ij} x_j \leq b_i, \qquad i = 1,2,\cdots,m \quad (x_j \geq 0, \qquad j = 1,2,\cdots,n)$$

where:

x_j: The number of units produced for product j;

$c_j(profit\_rate) = P - (1 + r)h$, where P is price, r is interest rate, and h is the cost;

a_{ij}: The amount of cost incurred for the production of a unit of product j under the cost category i;

b_i: Required funds (debt) under the cost category i;

Here concludes as maximization of profit.

Example 2-1. For example, let us suppose an economic entity sells two products: A and B. Assume the entity has sold x_1 and x_2 units of A and B respectively, and earned profits of c_1 and c_2 for each unit sold. The entity's goal is to maximize these profits. This behavioral principle can be expressed by equation (1). Next, assume that the manufacturing cost for each unit of A and B to be a_{11} and a_{12} respectively, and up to b_1 amount of money can be financed for the manufacture. Also, assume that the R&D cost for each unit of A and B to be a_{21} and a_{22} and up to b_2 amount of money can be financed for R&D activities. Here, we suppose that the cost incurred for the products are limited to the manufacturing cost and R&D cost. The assumption is that investment can be made by borrowing money. This situation can be expressed by the formula in equation (2). This is how the behavior of an economic entity may be expressed when it intends to maximize profit.

A formula of theory of constraints in the primal problem (example 2-1):

$$\max \quad [c_1x_1 + c_2x_2] \tag{2}$$

subject to:

$$a_{11}x_1 + a_{12}x_2 \leq b_1 \text{ (Manufacturing cost)}$$
$$a_{21}x_1 + a_{22}x_2 \leq b_2 \text{ (R\&D cost)}$$

where:

Products: A and B;

Cost categories: Manufacturing cost, R&D cost.

The manufacturing cost and R&D cost can be financed by a bank up to b_1 and b_2, respectively, and invested on products A and B.

Here concludes as Investments are made (increased).

Dual problem

Kinoshita[1)] calls the aforementioned Keynesian economics *the dual problem in Macro-Economics*. In the dual problem, the objective of economic behavior is to minimize debt. The dual problem in Macro-Economics can be expressed using the dual problem formula of linear programming (equation (3)). In other words, an economic entity will act in such a way as to minimize debt, which is expressed by the objective function.

Formulation of the dual problem:

$$\min \sum_{i=1}^{m} u_i b_i \tag{3}$$

subject to:

$$\sum_{i=1}^{m} a_{ji}u_i \geq c_j, \quad i = 1,2,\cdots,m \quad (u_i \geq 0, j = 1,2,\cdots,n)$$

where

u_i: Unpaid balance rate for the cost category i.

$$u_i = 1 - (amortization\_rate)$$

Here concludes as minimization of debt.

Example2-2. Let us consider previous example (example 2-1). On the conditions of the example, we suppose an economic entity has funds (debts) of b_1 for overall manufacturing and its unpaid balance rate is u_1. And The entity has funds of b_2 for overall R&D and its unpaid balance rate is u_2.

Here, unpaid balance rates are defined as $u_1 = 1 - (amortization\_rate)$ (manufacturing cost) and $u_2 = 1 - (amortization\_rate)$ (R&D cost). The economic entity will act to minimize its debt and this behavioral principle can be expressed by equation (4). This principle applies because the debt (manufacturing and R&D cost) per each product A and B becomes higher than the profit per unit, i.e., and the efficiency of investment drops below the market interest rate. Shifts of the behavioral principle from investment to payback of debts, can be expressed in equation (4). This explains the behavioral principle of an economic entity to minimize its debt.

A formula of theory of constraints in the dual problem (example 2-2):

$$\min \quad [u_1 b_1 + u_2 b_2] \tag{4}$$

subject to:

$a_{11}u_1 + a_{21}u_2 \geq c_1$ (Product A)

$a_{12}u_1 + a_{22}u_2 \geq c_2$ (Product B)

where:

Products: A and B;

Cost categories: manufacturing cost, R&D cost:

The debts for product A and B become bigger than respective profits, i.e. the efficiency of investment drops.

Here concludes as conclusion: Avoid investment (reduce investment).

Kinoshita proposes the Theorem of duality in Macro-Economics. Table 1 displays duality relationship items of the primal problem economy and the dual problem economy.

Table1 Summary of Duality in Macro-Economics(Kinoshita[1], p122)

	Primal problem economy	Dual problem economy
(1) Law	The invisible hand of God	Fallacy of composition
(2) Behavioral principle	Economic entities' maximization of profit	Economic entities' minimization of debt
(3) Say's Law	Supply creates demand	Not effective results in insufficient demand
(4) Principle of effective demand	Not effective A shortage in supply, i.e. crowding out may be possible	Demand creates supply
(5) Monetary policy	Effective	Not effective Lowering the interest would not tempt corporations to borrow money
(6) Financial policy	Not effective	Effective, the government is the biggest consumer
(7) Interest	Normal rate (inflation)	Ultra-low rate (deflation)
(8) Unemployment	None	Present
(9) Saving	Savings are invested	Savings will not be invested
(10) OR analysis	Primal problem in linear programming	Dual problem in linear programming

Bubble economy and its collapse

Kinoshita[2] defines the concept of economic growth, bubble economy, and destruction of bubble economy. He pointed out that there is a economic phase expressed by primal problem before bubble economy, and there is another phase expressed by dual problem after destruction of bubble economy. In the primal problem phase, which is mentioned in previous section, capital expenditures of private corporations grow, creating an impetus towards the maximization of profits. Adam Smith's "Invisible hand" makes the economy grow significantly.

The bubble economy is illustrated in Figure 2. Kinoshita describes why bubble economy occurs after the primal problem phase. A reason is increase of consumption

coefficient infinitely close to 1 by the economic growth. This has multiplier effects and expands economic infinitely, even without an increase in corporate investment in facilities. The economic equilibrium point in the figure, moves from A' to A^1, and to A^2. He defines the state with abnormally high investment effect as *bubble economy*.

And he describes that consumption coefficient larger than 1 causes bubble economy crashes. As a result of the crash, consumption activity returns to normal, and the economy suffers a great lack of demand. He refers the state to collapse of a bubble economy. Then the economy enters into dual problem phase.

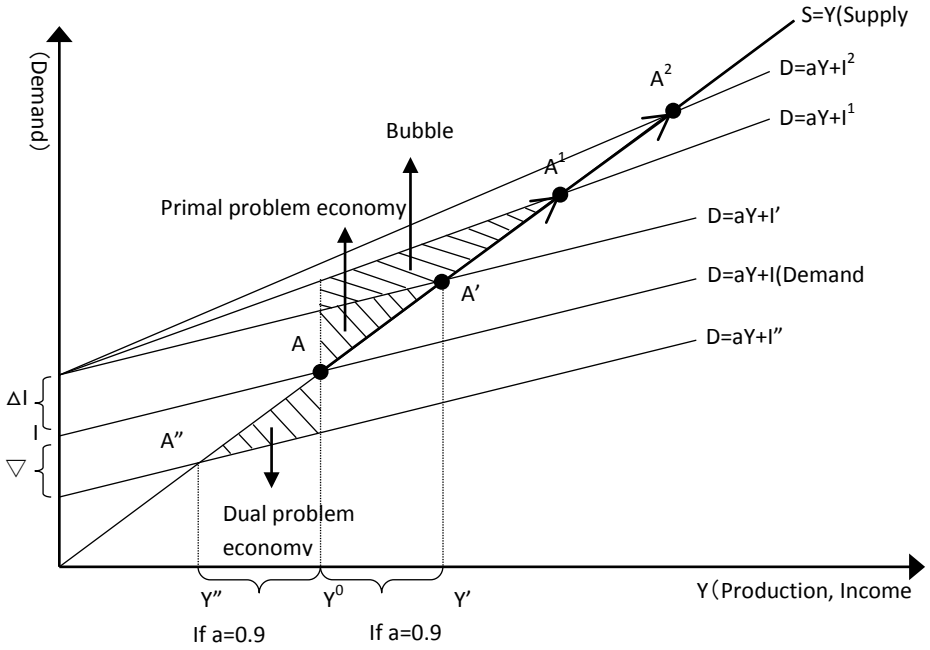

Figure 2 Bubble economy(Kinoshita[2)], p114)

Globalization trade

Moreover, Kinoshita[3)] found a condition when the Ricardo's comparative advantage theory can be justified. That is only when a macro economy is in the primal problem phase. In other words, Ricardo's theory of comparative advantage is not applicable when a macro economy is in the dual problem phase. He applied his original approach, which is based on operations research with linear programming, to prove the validity of Ricardo's comparative advantage theory.

He concludes that Ricardo's comparative advantage theory is applicable only when the economy in primal problem phase. In the phase, a globalization policy, or a policy of free trade, is the right choice, and they would benefit all the players. In brief, a policy of globalization is effective.

He further argues, on the other hand, the economy in a dual problem phase, Ricardo's comparative advantage theory is not applicable, and a free trade policy is not justifiable. In brief, an isolation policy is the right choice. If a globalization policy is adopted under such economic phase, all the players would suffer a loss and become poorer.

Thetical and Antithetical economics

Kinoshita[4)] arranges his contention that existence of the primal problem phase and the dual problem phase of Macro-Economics into a theory of *Thetical economics* and *Antithetical economics*. Fundamentals of the theory are naturally induced from his observations on Japanese recession and the U.S. sub-prime loan crisis. By being able to formulate corporate

behavioral principles and governmental behavioral principles using the concepts of primal and dual problems in linear programming, it has become possible to establish the concepts of the thetical economy and the antithetical economy in Macro-Economics.

These two economies have their respective theorems. Theorem in the thetical economy is Say's Law (supply creates demand), and the theorem in the antithetical economy is the principle of effective demand (demand creates supply).

He also demonstrates how a bubble economy occurs in thtical economics and how the bubble economy crashes.

Mechanism of four economic phases

Mechanism of four economic phases and transitions among them are described by Kinoshita[5]. The phases are thetical economy phase, antithetical economy phase, bubble economy phase, and bubble bursting economy phase.

He defines thetical phase and antithetical phase in Macro-Economics as subsets of economic space. These are models based on independent definitions. Under these definitions, he describes a bubble economy and the bubble bursting by investment efficiency $\frac{\partial Y}{\partial I}$, where Y is gross domestic product, and I is capital expenditure of economic entities in Macro-Economics. In the simple model, since the investment efficiency is expressed as an inverse proportionality of consumption coefficient, he describes a bubble economy and the bubble bursting through the variations of consumption coefficient. Increasing consumption coefficient increases investment efficiency $\frac{\partial Y}{\partial I}$, but when consumption coefficient surpasses 1, investment efficiency $\frac{\partial Y}{\partial I}$ drops from high efficiency level to less than zero (from $\frac{\partial Y}{\partial I} > 0$ to $\frac{\partial Y}{\partial I} < 0$). The drop is bubble economy collapse.

Conclusion

It is now almost ten years since subprime mortgage crisis or bankruptcy of Lehman Brothers. Notwithstanding, why are developed countries still in prolonged recession? Is the world economy is confused? Because we don't know two economic phases, thetical phase and antithetical phase, and then we fall in the trap of Macro-Economics.

The world economy will be released from the trap with studying Kinoshita's new Economic theory with his five papers[1)-5)], and his paradigm.

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