Monetary and Financial Factors in Kalecki's Investment Theory

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Abstract

Kalecki thought that monetary and financial factors play very important roles in the processes of investment decision and expenditure. He also acknowledged that interest rate is monetary phenomenon and investment finance is provided by banks prior to savings as Keynes did, and suggested that the more is the debt, the greater is the risk of debtor and lender. However, in developing investment theory he dismissed those monetary and financial factors or substituted into actual profit or savings, because he aimed to construct the investment theory explainable the 'automatic mechanism of the fluctuation of capitalist economy'. Thus it is argued that Kalecki did not consider the monetary and financial factors importantly in his investment theory.

This paper aims to reconstruct of Kaleckian investment theory that incorporates the monetary and financial factors that he dismissed. The introduction of the monetary and financial factors in the theory of investment decision and the mechanism of business cycle allows us to explain not only automatic business cycle, but also irregular with an abrupt financial crisis occurred at the end of boom. Moreover the revised Kaleckian investment theory can enrich the discussion of the mechanism of business cycle and growth in Kaleckian economic growth model, in which the monetary and financial factors also have almost been neglected. Introducing the monetary and financial factors into Kalecki's investment theory, we can develop the theory of investment decision and the mechanism of business cycle that enables us to explain the excessive investment and debt, financial crisis, and depression occurred in the process of business cycle.

Keyword: Kalecki, investment theory, financial crisis, business cycle

JEl code: E3, E5, G1

I. Introduction

Kalecki often referred to monetary and financial variables in discussing ad developing the theory of investment decision and the mechanism of business cycle process in his various articles. He considered interest rates, banks' willingness to lend, increasing risk, and entrepreneurial capital as explaining variables in developing the function of investment decision and investment finance, and the mechanism of business cycle. However, as Dymski argued, "monetary concepts seldom appear in Kalecki's mature writings, when they do, the author treats them sparingly" (Dymski, 1996). Thus, it could be argued that "Kalecki never presented a systematic analysis of complete monetary and financial system" (Sawyer, 2001). Kalecki, in fact, had dismissed the monetary and financial variables in the process of developing the function of investment decision and the mechanism of business cycle, due to various reasons.

This paper aims to rebuild Kaleckian theory of investment decision and financial structure and the mechanism of business cycle in which incorporate the monetary and financial variables that Kalecki dismissed. Kalecki ignored the monetary and financial factors to 'explain the relative regularity of business fluctuation' by automatic mechanism of investment expenditure (Kalecki, 1990, p. 66). However, Kalecki's theory of investment and business cycle cannot explain the excessive investment and debt derived from financing of the investment, the consequent decrease of investment and fall of profit, the default of firms with excessive financial commitment, and financial crisis that we can witness almost always during the boom and bust. We will argue that the rebuilding of Kaleckian investment theory and mechanism of business cycle could allow us to explain the development of excessive investment and overburdened debt, the consequent negative net profit and default, and financial crisis and depression using the new Kaleckian function of investment decision and the mechanism of business cycle.

The paper is organized as follows. In the second section, we trace how Kalecki dismiss the monetary and financial factors in the process of developing his theory of investment decision and the mechanism of business cycle nevertheless he analyzed and emphasized the influence of monetary and financial elements on investment decision and investment finance. In the third section, we incorporate the monetary and financial factors that Kalecki dismissed and develop Kaleckian investment decision and business cycle theory so that the theories can enable to explain not only the regular business cycle, but also excessive expansion of investment and debt, default, and crisis, in more detail and realistically. In the fourth section, we explain irregular business cycle with financial crisis and depression by the new function of investment decision and the mechanism of business cycle. In the last section, we will summarize the above discussions.

II. The dismissal of monetary and financial factors in Kalecki's investment theory

Kalecki considered monetary and financial factors such as the willingness of banking system to lend and the short-term rate of interest, increasing risk and entrepreneurial capital, and the long-term rate of interest as important elements in the process of developing his theory of investment decision and the mechanism of business cycle. However, in order to "set out a

mechanism which would explain the relative regularity of business fluctuations" (Kalecki, 1990, p. 66), he dismissed those factors and focused on only the real magnitudes such as real profit and fixed capital and investment. He thought the fluctuation of monetary and financial factors "are all determined by circular changes of the basic components" (Kalecki, 1990, p. 66). In relation to this, Lopez and Mott stated that "Kalecki had been brought up within the Marxist tradition – tradition where economics must analyse the 'inner laws of motion of capitalism. ··· He wanted to develop a theory that explain why a capitalist economy is capable of achieving 'expanded reproduction', and why long-run growth goes hand in hand with cyclical movements around the trend" (Lopez and Mott, 1999). We examine in the section how Kalecki considered those factors and why dismissed them in the process of developing his theory.

Banking system and the rate of interest

He first thought in 1932 that business cycle is led by fluctuation in investment activity and the fluctuation of investment, especially increase of investment in excess of savings, is made possible "by the banking system in various forms of credit inflation" (Kalecki, 1990, p. 148). Capitalists may desire to invest more than saving from their current profit after consumption expenditure, because their investment activity is not determined by previous profit, but by expectation of the future profitability of the investment project. Kalecki argues that the additional funds in excess of savings come from the creation of money by central bank and commercial banks. Commercial banks accommodate the demand of additional investment finance of capitalists and replenish their decreased reserve fund by increasing rediscount in the central bank.[1] Commercial banks can also increase the demand for credit by the lowering of lending interest rate, which may spur the investment decision of capitalists.[2] Thus Kalecki asserts that "without credit inflation, there would be no fluctuation of investment activity, and consequently there would be no major business fluctuations. *Business fluctuations are strictly connected with credit inflation"* (Kalecki, 1990, p. 148).

However, he disregarded the active role of banking system which affects to investment activity through permitting or not the demand of credit of entrepreneur or the lowering or the raising of interest rates to loan. In his 1933 article, he distinguished between the normal flow of money arising from the process of investment finance and repayment via banking system and the additional flow of money deriving from additional demand for increased production and risen prices. Then he insists that, in the case of former, capitalists do not need the additional money, because while some capitalists withdraw from their deposit accounts or borrow from banks to invest during a given period, the other capitalists get the same amounts

1 Kalecki mentioned that capitalists can directly get their credit from central bank, probably it may be possible at that time (Kalecki, 1990, p. 151).

2 Of course, Kalecki pointed out that the expected profitability of investment is more decisive factor in undertaking investment than interest rate, especially during crisis. Because during crisis the expected profitability falls to very low level, lowering interest rate may not be incentive to undertake investment.

as one that were expended by the former capitalists for investment during same period, and they deposit their account or repay their previous debt. In other word, the expenditure of some capitalist is converted into profit for other capitalists, and this profit flow backs into the banks in the form of deposits (Kalecki, 1990, p. 80). Then, there are no additional debts or additional credits in the side of capitalists as a whole or in the side of the banking system. Therefore, Kalecki insists in 1935 article that "disregarding the technical side of money market, e.g. the variable demand for means of payment, we may say that these outlays are 'financing themselves'. ··· Thus, the circle will close itself" (Kalecki, 1990, p. 137). Here, banking system, even if they have any role, is passive and permissive to the demand of capitalists at most.[3] This normal flow of money for investment spending and deposits or repayment to banks may leads Kalecki to dismiss the banking system in developing his investment theory and hence business cycle.[4]

The second flow of money, however, that is, the flow that Kalecki considered as the technical side of money market makes banking system not to be passive, but act as an active controller of credit supply depending on their balance sheet or their willingness to lend. Credit inflation through the accommodation of credit demand Kalecki considered in 1932 article may be relevant to this flow of money. In relation to this flow, he pointed out two reasons that make credit inflation of additional money flow inevitable. First reason is for investment reserve that is the difference between investment orders (I) and the production of capital (A), I-A. Expenditure for production of capital goods A returns to the bank in the form of realized profit and thus it 'finance itself', but I-A must be created by credit inflation. Second reason is for the increase of money in circulation due to the increase in aggregate production and prices. The increases of production and prices require some additional money in circulation. This demand also must be met by credit inflation by banking system (Kalecki,

3 This conclusion of Kalecki may derive from that his monetary economics is based on the German tradition of monetary theory. According to Toporowski(2012), "this led Kalecki to the conclusion that the expenditure of capitalists determines the circulation of money in the economy, and credit and monetary policy only affects the balance sheet of banking system". If the credit and monetary policy could not determine the circulation of money, banking system would not have any active role.

4 In relation to this matter, Asimakopulous (1983) brought out the question how investment orders are financing itself when the process of multiplier has time. He argued that "in order for Kalecki's circle to close itself, when investment finance is obtained through bank credit, it is thus necessary for both the operation of full multiplier and the retirement of bank debt equal to the initiating credit to have occurred." And also he insists that "Kalecki did not pay sufficient attention to the time required for the operation of the full multiplier in order to restore the liquidity position of the banking system" (Asimakopulous, 1983, pp. 455-456). However, Kregel (1989) disputes Asimakopulous' argument that "if the debts and credits cancel within the capitalist class, then the incomes also accrue within the capitalist class in the construction period: no time is required for Kalecki's multiplier to work, it is instantaneous within the defined period" (Kregel, 1989, p. 197). About this debate between Asimakopulous and Kregel, Messori (1991) distinguished two financing ways; investment financing and production financing. The former is for the monetary flows required to finance an increase in the demand for capital goods, and the latter means the monetary advances required to finance the purchase of working capital. Messori argues that "Kalecki, in concentration on investment financing, neglects production financing". However, Messori did not agree with Asimakopulous and he said "the time lag for the full operation of the Keynesian multiplier is no of account in Kalecki's financing" (Messori, 1991, p. 312).

1990, pp. 80-81). Of course, the increase of investment reserve and money in circulation is also fulfilled by a change of unattached deposits to investment reserve or money in circulation, e.g. deposits of specific designation, in other word, by a change in the composition of bank liabilities without an increase in bank credits. However, in reality the increase of investment reserve and money in circulation might also be met by an expansion of credit supply of banking system.[5] In many case, the increases of investment reserve and money in circulation should bring about the rise in interest rates on deposit and credit. In the upswing the interest rates rise and they fall in the downswing (Kalecki, 1990, p. 97). Now the willingness of banking system to create the credit and the rate of interest on credit might be important elements in function of investment decision.

Nevertheless, Kalecki dismissed these factors in elaborating the function of investment decision under two presumptions: first presumption is that banking system accommodates the credit inflation by setting the interest rate not too much high. When demand for credit increase, banking system, especially central bank responds to it by raising the interest rate, but the rate should be the level not prohibitive to the increase of investment. Kalecki said that "the precondition for the upswing is that the rate of interest should not increase too much in response to an increased demand for cash" (Kalecki, 1990, p. 191). Second presumption is that interest rate is rise and fall in line with business cycle, thus it moves in proportion to gross profitability. Kalecki regards the rate of interest as an increasing function of the gross profit. Then, the rate of interest disappeared in the function of investment decision. He goes further. He argues that even if expressing the interest rate as a function of profitability would be only a crude approximation,[6] "the rate of interest is of secondary importance for the will to invest" in comparison with gross profitability (Kalecki, 1990, pp. 97-98). Kalecki considered the rate of interest as approximation of profitability and the second important factor compared with profitability, and dismissed it as appeared in the following transformation from equation (1) to equation (2) (Kalecki, 1990, p. 97).

….. (1)

….. (2)

Increasing risk and entrepreneurial capital

On the contrary to classical economists Kalecki argued that what limits and determines optimally the volume of investment is not the decreasing marginal rate of profit, but increasing risk and entrepreneurial capital in 1937. Classical economists believed at that time marginal rate of profit fall as the volume of capital to be invested increases, due to large-scale

5 Kalecki said that only the latter is credit inflation in a strict sense (Kalecki, 1990, p. 95).

6 The reason that Kalecki said this presumption is a crude approximation is that he made two assumptions for this presumption: the rate of interest is determined in market without the intervention of central bank, and there is no crisis of confidence. These matters are dealt in next section in more detail.

diseconomies and imperfect competition. However, Kalecki asserted that large-scale diseconomies are not unrealistic, because although every factory has an optimum size, they could be duplicated so that several factories would be constructed without additional increasing cost. He also denied the second reason. Imperfect competition could limits the amount of capital invested in any particular field, but investment projects could spread over various fields and would not be limited by imperfect competition. Then, the marginal rate of profit would be constant, regardless the volume of capital invested (Kalecki, 1990. pp. 286-287).

Now, unlike classical economists' argument, Kalecki argues that it is reasonable to assume that marginal rate of increasing risk increases with the increase of amount of capital invested and constrains the size of optimal capital. Here increasing risk means that as the volume of investment increases, entrepreneur's income after interest expense reduces and can reverses to loss. If the loss continues long enough, entrepreneur will be faced with bankruptcy. That is, increasing risk is the risk of the likelihood of bankruptcy in a firm or an investment project accompanied with increasing investment and debt. Now, Kalecki argued that optimal volume of capital which gives maximum profits to entrepreneur is determined by "the condition of the marginal rate of profit being equal to the sum of the marginal rate of risk and the rate of interest" (Kalecki, 1990, p. 288). The marginal rate of profit is constant as we saw above and the rate of interest is also stable regardless of the increase of capital. Thus, what is important in determining the optimal volume of capital to be invested is the increasing risk, in more detail word, the marginal rate of increasing risk.

Kalecki emphasized the importance of increasing risk in the determination of optimal volume of capital, and also related it to financial commitments. The burden of risk borne by a firm is proportionate to the total financial commitments, that is, sum of past and present commitments. In fact, the commitments equals to the difference between the capital equipment plus investment order and the entrepreneurial capital. The greater is the capital equipment and the investment order and the smaller is entrepreneurial capital, the greater is the financial commitment. Then, increasing risk is proportionate to the capital equipment and investment orders, and is inversely proportionate to entrepreneurial capital. Anyway, the greater is commitments of a firm, the greater is risk borne by the firm. Kalecki connected this relationship to business cycle in *The Theory of Economic Fluctuation* of 1939. In upswing, the increase of investment order and consequent capital equipment at given entrepreneurial capital increases commitment of a firm and risk borne by the firm. And then, investment order decreases and the economy shifts to downward trend.[7]

Meanwhile, in his *Theory of Economic Dynamics* of 1954, Kalecki transformed the notion of increasing risk into entrepreneurial capital. In there, he points out entrepreneurial capital as a factor with decisive importance in limiting the size of a firm. Here entrepreneurial

7 The downturn in the economy is developed by the process that the increase of investment order and consequent capital equipment during the period of prosperity reduce the prospective profit and the marginal rate of profit. Because "the rate of investment decisions is an increasing function of the gap the prospective rate of profit and the rate of interest" (Kalecki, 1990, p. 540), the decrease of prospective rate of profit will reduces investment order. Then the business cycle shift to downturn.

capital means the amount of capital owned by the firm. In the 1937, he related the entrepreneurial capital with the amount of commitment of a firm, and the commitment with the risk of the firm. We can infer the relation of the above easily; if entrepreneurial capital is large enough, the amount of commitment would be needed less and increasing risk would be little. Kalecki stated it with a little differently in 1954 as follows, “the size of a firm thus appears to be circumscribed by the amount of its entrepreneurial capital, both through its influence on the capacity to borrow capital and through its effect on the degree of risk” (Kalecki, 1991, p. 278). He relates entrepreneurial capital with the capacity to borrow capital in here, while he related it with the small demand of borrowing formerly. Entrepreneurial capital affects the access of a firm to the capital market. “A firm with a large entrepreneurial capital could obtain funds for a large investment, whereas a firm with a small entrepreneurial capital could not. ··· The expansion of the firm depends on its accumulation of capital out of current profits” (Kalecki, 1991, p. 278).

Increasing risk and entrepreneurial capital were very important factors in the determining of investment decision and the limiting of the size of a firm in Kalecki, however he did not analyzed further the influence of financial factors on boom and bust that are appeared in this process; the borrowing of external fund and investment decision, the excessive investment expenditure and overburden loan, and the increasing risk and the likelihood of default. Instead, he reduced increasing risk and entrepreneurial capital to ‘savings out of current profits’. When explaining the determinants of investment decisions in his *Theory of Economic Dynamics* of 1954, he considered four determinants; gross savings(*S*), changes in profits(, changes in the stock of fixed capital(, and long-run technical progress(*d*) as follows (Kalecki, 1991, p. 283).

(3)

Of these determinants, gross saving(S) is the factor that represents increasing risk and entrepreneurial capital. Kalecki refereed to about this as follows; “the gross savings of firms thus extend the boundaries set to investment plans by the limited capital market and the factor of increasing risk” (Kalecki, 1991, p. 282). However, the active role of increasing risk and entrepreneurial capital are disappeared in this function of investment decision and reduced to simple savings of capitalists. In addition to it, in explaining business cycle the factors of increasing risk and entrepreneurial capital were eliminated perfectly as Kalecki replaced gross savings to investment. He reduced determinants such as savings, profit, and capital to past investment ($I_{t\text{-}w}$) and present investment (I_t) in order to show the autonomous process of business cycle as equation (2) (Kalecki, 1991, p. 302).

…. (4)

Here, *q* denotes the propensity to consumption by capitalist, denotes the share of labor income. The = , , and *e* is coefficient of investment in inventories.

Long-run rate of interest

Kalecki distinguished the short-term rate and the long-term rate of interest since 1939. He argued that what relates to the determination of investment and to the business cycle mechanism is the long-term rate of interest several times. In *The Theory of Economic Fluctuations* of 1939, he stated that "the rate of investment decisions is an increasing function of difference between the marginal rate of profit and the rate of interest. Since it is the long-term rate that matters here ⋯ " (Kalecki, 1990, p. 309). Also in *Theory of Economic Dynamics*, he also mentioned that "as it is long-term rate of interest rate that is relevant to the determination of investment and thus to the mechanism of the cyclical process ⋯ " (Kalecki, 1991, p. 276).

While he acknowledged the importance of long-term rate of interest, he did not incorporate the long-term rate as explaining variable in the process of elaborating of the theories of investment decision and business cycle. He always thought that the long-term rate of interest is stable and has smaller fluctuation than the short-term rate. Thus, the long-term rate of interest is not considered as an important element in the analysis of the determination of investment decision and the mechanism of business cycle by him. The reason he thought that it is stable or shows smaller fluctuation is that it (is determined by the expected average discount rate (short-term rate) (, the net disadvantages of bond holding (), the possibility of a capital loss ().

…. (5)

Kalecki presumes that and are stable, and also stable and has smaller fluctuation than every short-term discount rate because is average value. The fluctuations of short-term rate are only partly reflected in the long-term rate of interest. Thus long-term rate of interest is treated as stable and unimportant variable by Kalecki.

III. The restoration of monetary and financial factors in Kalecki's Theory

As we saw above, Kalecki dismissed monetary and financial factors in developing his investment and business cycle theory. In so doing, while he could get a mechanism to explain the autonomous and regular business fluctuations, he might miss the theory of investment decision and the mechanism of business cycle to provide a richer explanation for the various financial problems such as excessive financial commitments, overburden debts, consequent default, and financial crisis, arising at cyclical upswing and downturn. We restore the monetary and financial factors that Kalecki dismissed, and rebuild the function of investment decision and the mechanism of business cycle.

The function of investment decision

Kalecki's theory of investment decision had been developed from above equation (1) to equation (3). In the process, he dismissed the monetary and financial factors such as the willingness of banking system to lend, the short-term rate of interest, the rising risk and the entrepreneurial capital, and the long-term rate of interest. The willingness of banking system to lend and the short-term rate of interest were omitted during the process of equation (1) to equation (2), the long-term rate of interest was eliminated in the process of building equation (3) in which other factors except the rate of profit, such as capital equipment, savings of entrepreneurial capital, and technical progress were added newly. However, the rising risk and the entrepreneurial capital were reduced to the savings of entrepreneur in equation (3).

Now, we could restore these factors in the function of investment decision. Then, extended investment decision function would be as follows.

… (6)

In the above equation (6), the four terms on the right-hand side of equation are same as the terms on equation (3).

In the fifth term on right-hand side of equation, represents the influence on investment decision of the short-term rate of interest (with coefficient . Kalecki eliminated the short-term rate of interest for reason that it moves in proportion to gross profitability. However, as he pointed out, it is valid only under two assumptions: "i) *i* is market rate, i.e. we leave aside intervention of central bank; and ii) there is no crisis of confidence when during the depression, the rate of interest rises" (Kalecki, 1990, p. 74). If these assumption must be relax, the elimination of the short-term rate of interest would not be valid. In fact, he also emphasized that equation (2), reduced from equation (1), "holds so long as there is no intervention of central bank and no crisis of confidence" (Kalecki, 1990, p. 75). He emphasized in particular the importance of 'crisis of confidence' in the analysis of money market. The crisis of confidence breaks out during the depression with a sudden fall in the prices of financial assets, and makes it difficult or impossible to service debt and pay interest. He insists thus that "the crisis of confidence must be regarded as a factor disturbing the regular functioning of our mechanism of the business cycle" (Kalecki, 1990, p. 98). Now, if we need to analyze the financial panic or financial crisis appearing at the end of boom, we should incorporate the short-term rate of interest. Notwithstanding that Kalecki did not pay attention on the active role of central bank, the influence of central bank on the fluctuation of the short-term rate of interest would not be little. In many cases, central bank reacts to the demand for credit by commercial banks anti-cyclically. In the boom, central bank raises the rate of discount or nominal policy rate of interest (set by central bank) to check inflation or the expectation of inflation, and in the slump, lowers it. Thus if we consider the crisis of confidence and the active policy of central bank, the short-term rate of interest could fluctuate more than that of the rate of profit, and must be incorporated in the function of investment decision.

The sixth term is the debt that entrepreneur can borrows from commercial banks, and it has a positive effect on the investment decision. The debt *D* is determined by credit that

depends on the willingness of commercial bank to lend. Kalecki acknowledged that the precondition for upswing is the accommodation of the demand for credit by banking system, however he thought and assumed that banking system, commercial banks and central bank, accepts the demand for credit without any large hesitation. He referred that “the demand for bank credits increases, and these are granted by the banks” (Kalecki, 1990, p. 190). Also, he assumed that central bank accommodates the demand for discount by commercial banks without raising the rate of interest largely. “The possibility of stimulation the business upswing is based on the assumption that the banking system, especially the central bank, will be able to expand credits without such a considerable increase in the rate of interest” (Kalecki, 1990, p. 489). However, commercial banks could respond to the demand for credit for investment not always only passively, but sometimes actively. They would provide the credit to entrepreneur aggressively in the boom and restrict to credit tightly depending on their balance sheet or liquidity preference. Thus the willingness of banks to lend and the consequent the volume of credit or debt are too important for investment decision to dismiss. Furthermore, if we want to find the mechanism of excessive investment and debt that appears in the boom almost always, we should incorporate these elements. We will consider here the debt D as a variable that represents the willingness of banks to lend and the consequent the volume of credit or debt.

The seventh term represents the influence of increasing risk () on investment decision. The increasing risk is an increasing function of debt. The greater is debt of a firm, the greater is risk, that is, the possibility of default that the firm is faced with. Kalecki introduced this notion in order to set the optimal volume of investment to give maximum gain to any firm on the contrary to classical economists who argued that the decreasing marginal profit sets the optimal volume of investment. He also emphasized that the increasing risk and the entrepreneurial capital of individual firm limit the expansion of each firm. However he did not consider themselves directly as important factors in determining investment decision. Instead, he reduced them to the rate of profit as explained above. As Mott (2010) points out, “Kalecki used it to justify the explanatory role of profits in his investment model” (Mott, 2010, p. 5). Increasing risk is an important factor for itself in the determination of investment decision. The increase of capital equipment and additional investment orders of firms make their financial commitments grow the larger scale, thereby the increased debt leads the firm’s risk to be greater. The increase of risk in turn has the negative influence on the investment decision.

The eighth term is the effect of the long-run rate of interest on the investment decision. Kalecki considered the long-run rate of interest as a stable and unimportant variable, and dismissed it in the elaborating his theory of investment decision. However, the stability of capital loss possibility () that Kalecki presumes as the one of conditions of stability of the long-run rate of interest is not realistic. Although the rate of government bond and corporation bond with high credit rating would be stable relatively, the rate of returns of bond with a lower credit rating varies with a large fluctuation according to their states of balance sheet which depends on the state of economy. The yield spread between government bond and risky bond, for example BB rating bond, in many countries has a large fluctuation. Especially during the downturn of economy the spread rises in a large scale due to increased

uncertainty.[8] Such an abrupt rise of the long-term rate of interest in bonds that were issued by risky firm would reduce the investment decision largely, due to not only increasing new financial cost, but also the burden of the payment of interest and the repayment of existing debt. Thus the long-term rate of interest should not be neglected in discussing the factors affecting to investment decision and business cycle.

The business cycle

Kalecki represented the mechanism of business cycle by above equation (4) that is derived from the equation (3). He substitutes savings (*S*) to investment (*I*) based on *S*=*I*, profit (*P*) to past investment (I_{t-w}), the rate of change in fixed capital equipment () to net investment, and the change rate of investment in inventories added newly) to past investment in equation (3). And he transformed the equation (3) into the equation (4) which represents the mechanism of business cycle. He again transformed the equation (4) to the below equation (7) in which net investment (*i*) is represented by a function of the past net investments.[9] Here notations of each letter symbol are same as in equation (4).

…. (7)

Kalecki said that "this is the equation which will serve as the basis of our analysis of the mechanism of business cycle" (Kalecki, 1991, p. 303). From the above equation (7), when he explains the mechanism of business cycle, he assumes that the coefficient of the first term on the right-hand side of equation (7) is less than 1, that is, < 1. This assumption makes that the increase of net investment stops a certain level and reverses to the decrease. Because is less than 1, the next net investment at the peak level of net investment would be less than the peak level of net investment, because is 0 on the peak. The assumption of a/(1+c) < 1 allows the investment activity to move cyclically without any excessiveness or irregular explosion such as crisis.

Kalecki explains why a/(1+c) is less than 1 as follows; "it reflects the negative influence upon investment of the increasing capital equipment (c > 0) and possibly also the factor of incomplete reinvestment of savings (if a <1)" (Kalecki, 1991, p. 306). However, the assumption seems not to be appropriate. Especially the coefficient *a* that represents the effect of savings on investment decision can be larger than 1, and might be very large value in the boom with optimistic expectation about the future. In fact, as coefficient *a* is similar to debt-equity ratio, the greater is the borrowing fund from outside, the larger is *a*. The *a* is not always less than 1, rather it exceeded 1 during the boom phase. And it would be very small during the slump period. Therefore it is reasonable that *a* is a function of time, *a* = *a(t)*. Then, equation (7) should be altered as follows.

8 Dymski argues that Kalecki did not consider long-run matters in the analysis of investment decision and focus on the short-run. Because he focused on short-run, he ignored uncertainty (Dymski, 1996, p. 124).

9 On the detailed explanation for the transformation, see Kalecki (1990), pp. 288-302.

…. (8)

Although equation (8) becomes to be more realistic than equation (7), it makes it more difficult to explain the autonomous downturn at the peak of business cycle. In equation (7), downturn is proceeded by the decrease of next net investment at the peak due to $a/(1+c) < 1$. However in equation (8), $a(t)/(1+c)$ is not less than 1 depending of the state of firms, rather it can be larger than 1, especially in the boom. Thus next net investment even at the peak of boom does not decrease, rather investment decision increases continuously.

Now we should find factors to bring about the downturn of business cycle at the peak, not depending on the negative effect of capital equipment on investment decision. Investment decision equation (6) can provide an answer for this problem. At the peak, the short-term and the long-term rate of interest rise at high level, the risk also increase due to the increased debt in a large. These factors limit the increase of investment decision and net investment and may decrease the net investment at the peak. This process of downturn could be smooth or destructive. If a firm does not have an excessive debt and there is no 'crisis of confidence', the process will be smooth. However, if firms have an excessive debt and there is crisis of confidence in the financial market, the process will be destructive and a firm with excessive debt would be thrown into default.

In relation to the latter, Minsky already argued that the integration of Kaleckian analysis of profit and liability structure has a central importance in studying the behavior of economy with elaborate financial structure. In this economy, the debt structure must be validated by each period's income flow or profit in order for the economy to function normally. Thus, Minsky said that "the Kaleckian emphasis upon profit and the recognition that profits are the cash flow that enable business debtors to meet their commitments means that integration of financial structure into the determination of the basic behavior of the economy is natural" (Minsky, 2013). We now can represent the relation between profit and the burden of debt and interest of an economy. In order for an economy not to throw into the recession, profit must be larger than the amount of debt obligation as follows.

….. (9)

Here, denotes profit, the consumption of capitalist, the weighted average rate of interest of the short-term and long-term rate of interest rate. If the indebtedness of an economy increases in a large and investment decision shrinks, and uncertainty or the crisis of confidence appears at the peak of boom, the economy would be converted into the downswing in business cycle and plunged into depression.

We now have the function of investment decision and the mechanism of business cycle that can explanation irregular business cycle that has excessive investment, over indebtedness, financial crisis, and depression, We can also get the richer explanation than Kalecki's explanation in which business cycle is autonomous and regular due to the elimination of the monetary and financial factors. If we consider the determinants of investment decision represented in equation (6) and the financial structure and its relation to the profit together,

we could get the more realistic and plentiful explanation about the mechanism of business cycle, financial crisis, and depression. In next section, we will analyze and develop these matters again.

IV. Excessive investment and financial crisis in Kalecki's Theory

Now equation (6), (8), and (9) allow us to analyze the business cycle with excessive investment, overburdened debt, financial crisis, and depression, in which we can consider the monetary and financial elements. We develop the mechanism of business cycle with the function of investment decision (6) simply.

During the prosperity and boom phase, the desire of firms to expand investment decision is very encouraging and active, thus the coefficient of savings a may be larger than 1. Entrepreneurs want to plan the more investment decision and intend to invest in excess of their savings by borrowing from banks. The banking system supports the expansion of investment by accommodating the demand for credit or not increasing the rate of interest. The willingness of banks to lend is favorable to the demand of borrowing of firms, therefore the debt of firms increase without any obstruction. The short-term rate of interest is also continued at low level, because central bank needs not to restrict the credit expansion yet. The risk is also not great due to the rising rate of profitability and the relative low burden of indebtedness. The desire to expand investment and the willingness of banking system to accommodate this demand for credit increase the investment decision and the debt of firms. However, the debt can be serviceable and debt structure would be stable because, on the one hand profit is large due to the increasing investment and indebtedness is relative small yet, and on the other the short-term and long-term rate of interest is maintained at low level. Thus, the profit in each period is larger than the amount of obligation of repayment of interest and installment during this phase. That is, .

In the end of the boom, the willingness of banking system to lend becomes to be unfavorable because the debt of firms is too large relative to each entrepreneurial capital and the risk in the ability of repayment also rise largely. Thus the short-term rate of interest rises to the high level so that firms are faced with difficulty in financing the additional credit for net investment. Thus investment decision begins to decrease at the end of boom and investment expenditure also in turn decreases. The decrease in investment expenditure results in the fall of profit because profit is the sum of investment and consumption of capitalists. In addition to it, financial structure also begins to be unstable. While the profit is decreasing, indebtedness reaches a considerable scale and the rate of interest also rise to high level in this peak. Now, net value of profit after payment of financial obligation is likely to be less than 0 in firms with large debt.

During the recession, investment decision decreases continuously and profit shrinks largely. They lead to the decrease of consumption and savings of capitalists, and it in turn contracts investment decision and profit further. Moreover, the decreased profit now cannot services debts and pays interest, especially in firms with excessive debt. In such a situation, a 'crisis of confidence' is inevitable in the financial markets. If a crisis of confidence would

appear in the financial markets, the short-term and long-term rate of interest rise suddenly and the financing of additional fund for investment expenditure or repayment the existing debt is not possible. Now the more firms cannot service their debt and fall into bankruptcy. The bankruptcies in many firms lead to the deterioration of balance sheet in banking system and, as a result financial crisis in a economy.

The incorporation of monetary and financial factors into Kaleckian investment decision and business cycle theory allows us to explain the investment decision and the mechanism of business cycle more plentifully and realistically than Kalecki's own theory that dismisses those factors. By this extended model, we can verify the excessive investment decision, overburdened debts, and the risk of default appeared in the end of boom, and also explain the financial crisis that breaks out during the recession period.

Ⅴ. **Conclusion**

Kalecki considered that the monetary and financial factors play very important roles in the processes of investment decision and business cycle. He also acknowledged that interest rate is monetary phenomenon and investment finance is provided by banks prior to savings as Keynes did, and suggested that the more is the debt, the greater is the risk of debtor and lender. However, in developing his investment theory Kalecki dismissed those monetary and financial factors or substituted into another variable such actual profit or savings, because he aimed to construct the investment theory that can explain the 'automatic mechanism of the fluctuation of capitalist economy'. Thus it is argued that Kalecki did not consider the monetary and financial factors importantly in his investment theory and the mechanism of business cycle.

This paper restores the monetary and financial factors such as the willingness of banking system to lend, the short-term rate of interest, increasing risk and entrepreneurial capital, and the long-term rate of interest in Kalecki's theory of investment decision and the mechanism of business cycle. And it rebuilds a new Kaleckian theory of investment decision and the mechanism of business cycle that incorporates the monetary and financial factors that Kalecki dismissed. The new Kaleckian theory allows us to explain not only automatic business cycle, but also irregular behavior of investment decision and investment finance, the fragile financial structure, and the default of a firm with excessive indebtedness and financial crisis.

The formation of excessive investment decisions and overburdened debts during the boom is resulted from the coincidence of the increasing demand for credit reflecting the desire to invest larger and the willingness of banking system to accommodate credit demand and under-appreciation of risk by banking system. And excessive investment decisions and overburdened debts lead to the decrease in investment decision and investment expenditure, and consequent the fall of profit. Then, the negative net profit after payment of financial cost and the abrupt crisis of confidence is appeared due to the decrease of investment. They, in turn, bring about the sharp rise of the short-term and long-term rate of interest. In the end, the firms with high debt cannot but fall into the bankruptcy, and the banking system also cannot avoid the failure. Thereby, the financial crisis occurs in the peak of boom and it leads to the

depression.

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