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The Reconsideration of “Valuation Ratio” from the Contemporary Perspective

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The purpose of this paper is to reconsider the “valuation ratio,” a close notion to the so-called “Q-ratio.” It is always assumed to be a *constant*, even though it is not equal to unity. However, the assumption is inappropriate from the contemporary perspective. In fact, it has obscured the weakness of the post-Keynesian theory. Therefore, the assumption should be removed. We examine the result when its ratio is regarded as a *variable*. Finally, we conclude the need for the introduction of new parameter to denote a proportion of newly issued securities to the total purchased.

JEL Classification Numbers : E12, E44, G10

Key Words : Valuation Ratio, Capital Gain, Income Distribution

1. Introduction

The economies of major industrialized countries have been extremely unstable since the late 1980's. Japan, who had been admired as “Japan as No. 1” in the past, has not yet recovered from the damage of the burst of the bubble in the late 1980's and even now suffers from such economic problems as non-performing loans and deflation. Also, the US, whose economic performance during 1990's deserved to be called the “new economy,” is faced with uncertainty, particularly after the collapse of stock prices. Their common feature is that the boom and burst of asset prices is one of the determinants of the economic fluctuation. Therefore, it is an urgent subject for both monetary economics and economic policy to scrutinize the influence of asset price fluctuations on the real economy.

The subject, however, is not *new*. For example, Marx had the following questions :

First : ... Is the so-called plethora of capital—an expression used only with reference to the interest-bearing capital, i.e., moneyed capital—only a special way of expressing industrial over-production, or does it constitute a separate phenomenon alongside of it?

...*Secondary* : To what extent does a scarcity of money, i.e., a shortage of loan capital, express a shortage of real capital ? (Marx, 1971, p. 476)

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Both Keynes himself and many monetary post-Keynesians probably share these questions, in which a bold declaration to permit a *possibility* of the existence of (moneyed) capital is included. The subject denotes a phenomenon that an accumulation of moneyed capital is independent of that of real capital.

After the 2nd World War, however, there was a reason to forget the importance of the phenomenon. It was because of the Bretton-Woods system, where various financial regulations were imposed domestically as well as internationally in order to make the control of domestic effective demand easy. Therefore, the accumulation of moneyed capital independent of that of real capital was almost impossible under the system, and the phenomenon was seldom observed under the system. In the present, however, the system has already collapsed and the phenomenon is in fact frequently observed.

Therefore, we should pay theoretical attention to the phenomenon again. Unfortunately, however, the notion of “moneyed capital” in the above-sense seems to be inconsistent with a framework of mainstream economics based upon the principle of marginalism. On the other hand, the post-Keynesian economists have paid more comprehensive attention to various roles of monetary forces. But, from our viewpoint, we cannot conclude the phenomenon has been sufficiently addressed. We would, therefore, like to examine whether a notion of “valuation ratio” in Kaldor (1966) could be a clue to address or not.

In section 2 we review the notion of valuation ratio and some existing models based upon the ratio and show that all of the reviewed models have an inappropriate assumption, at least from our viewpoint, of a *constant* valuation ratio. In section 3 we examine what happens to the models when we remove the inappropriate assumption. In section 4 we examine a criticism by Davidson (1978, 2002), which is common to all of the reviewed models, and show that the criticism is incomplete. In section 5, finally, we summarize the results and point out an important problem that has been so far neglected.

2. The Constant Valuation Ratio

2.1 The valuation ratio

First of all, let us review the notion of “valuation ratio” itself. Kaldor (1966) defined it as follows ;

$$\nu \equiv \frac{pN}{K}, \quad (1)$$

where p , N , K denote price per security, its number, the amount of real capital, respectively. It is a close notion to the so-called “Q-ratio” in Tobin (1969). The difference is that the Q-ratio is regarded as a theory of investment, while the valuation ratio is not.

The original purpose of the concept of valuation ratio was to more validly explain the reason why a saving rate out of profits is higher than that out of wages. Kaldor thought it is not because of the nature of individuals who own wealth, but the existence of corporation.¹⁾ Therefore, capital gain is just a secondary interest. The main attention is paid to corporate retention. As a result, no one doubts an assumption that the valuation ratio is a *constant* in all of the models on corporate economy.²⁾ Other than Kaldor (1966) and Moss (1978), we can regard Kahn (1972), Marris (1972), Moore (1973, 1975), and some models in Marris and Wood (1971) as the representative models of corporate economy.

As far as these models are concerned, we can classify them into two types. One is where the rate of interest (discount) does not appear in the models, the other is where it explicitly appears. The examples of the former are the models of Kaldor and Marris, and the latter are the models of Moore and Moss, and Kahn – whose model is microeconomic rather than macro –. Let us briefly review the essence of two types of models.

2.2 Kaldor model – the neo Pasinetti theorem – as an example of the former

The capital gain can be defined by differentiating (1) ;

$$G \equiv \dot{p}N = \nu \dot{K} - p\dot{N}.$$

Kaldor formulated the equilibrium condition in the securities market as follows³⁾ ;

$$s_w W = cG + fgK, \quad (2)$$

where s_w , c , f , g , W denote the saving rate out of wage, the proportion of consumption out of capital gain, the proportion of external finance to total investment expenditure, the growth rate, and wage, respectively. The left-hand side denotes a demand for securities and the right-hand side denotes a total supply of securities ; the first term of right-hand side denotes a supply of existing securities and the second term denotes a supply of newly issued ones.

Supposing that Y , P , I denote the amount of income, profit, and investment, respectively, then we can obtain the following equation from (2) ;

$$s_w (Y - P) - c(\nu - f)I = fI. \quad (3)$$

Because all of internal funds are expended on investment, the following

1) We should notice the difference between a capitalist economy, as in Pasinetti (1974), and a corporate economy. See Moss (1978, p. 308) in detail.

2) The exception, as far as we know, is Lavoie and Godley (2002), in which the constancy of valuation ratio is not assumed. However, their purpose is not the analysis of corporate economy itself.

3) Some notations and expressions in formulas are different from the original ones. It was done in order to make them coherent in the whole of this paper, including appendices.

equation is satisfied ;

$$s_c P = (1-f)I, \quad (4)$$

where s_c denotes a corporate retention rate. Adding (3) and (4), we can obtain the rate and the share of profit ;

$$r \equiv \frac{P}{K} = \frac{1+c(\nu-f)}{s_c - s_w} g - \frac{s_w}{(s_c - s_w)\kappa}, \quad (5)$$

$$\pi \equiv \frac{P}{Y} = \frac{1+c(\nu-f)}{s_c - s_w} \kappa g - \frac{s_w}{s_c - s_w}, \quad (6)$$

where κ denotes the capital-output ratio, which is assumed to be a constant throughout this paper because of Harrod neutral technical change. Of course, a famous requisite for the post-Keynesian, $s_c > s_w$, must be fulfilled.

Furthermore, by means of (3) and (5), we can obtain the valuation ratio ;

$$\nu = \frac{s_w(s_c - \kappa g) + f\{s_w + (c-1)s_c\}\kappa g}{cs_c \kappa g}. \quad (7)$$

This ratio shows that “given the savings-coefficients and the capital-gains-consumption coefficient, there will be a certain valuation ratio which will secure just enough savings by the personal sector to take up the new securities issued by corporations” (Kaldor, 1966, pp. 317-8),⁴⁾ therefore the full employment is always achieved in the economy.

2.3 Moore model as an example of the latter

Let us review the simplest model in Moore (1973) which has various savings functions ; the model has homogenous saving propensities. In other words, except for corporate retention, we do not distinguish saving rates from the form in which income is received. Supposing that s_w denotes only a saving rate. Then, the term of $s_w\{W + (1-s_c)P + G\}$ denotes the savings except for corporate retention when there is capital gain.

In the model, the capital gain is expressed in several ways ;

$$G \equiv \dot{p}N = \nu \dot{K} - f\dot{K} = (\nu - f)\dot{K} = (\nu - f)I = (\nu - 1)I + s_c P. \quad (8)$$

The following must be satisfied in equilibrium ;

$$s_c P + s_w\{W + (1-s_c)P + G\} = I + G.$$

Transforming the above by means of (8), we can obtain ;

$$s_w\{Y - s_c P + (\nu - f)I\} = \nu I.$$

4) As a matter of fact, the rate of profit and the valuation ratio derived here is different from those in the original model, though we embrace the same assumption as the original. Because we have concluded that those in the original have little macroeconomic significance. See Appendix A in detail.

Adding fI to both sides, we can obtain ;

$$fI = s_w(Y - s_c P) - c_w(\nu - f)I,$$

where c_w denotes the consuming rate. Furthermore, by means of ⁽⁴⁾ we can obtain ;

$$I = s_c P + s_w(Y - s_c P) - c_w(\nu - f)I.$$

From the above, we can obtain the rate and share of profit ;

$$r = \frac{1 + c_w(\nu - f)}{s_c(1 - s_w)}g - \frac{s_w}{s_c(1 - s_w)\kappa}, \quad (9)$$

$$\pi = \frac{1 + c_w(\nu - f)}{s_c(1 - s_w)}\kappa g - \frac{s_w}{s_c(1 - s_w)}. \quad (10)$$

Furthermore, assuming that the rate of return on securities is equal to the rate of interest, i , which is exogenously given, we can obtain ;

$$i = \frac{(1 - s_c)P}{\nu K} + \frac{(\nu - f)I}{\nu K}.$$

By taking account of ⁽⁴⁾, we can transform the above equation as follows ;

$$\nu = \frac{r - g}{i - g}. \quad (11)$$

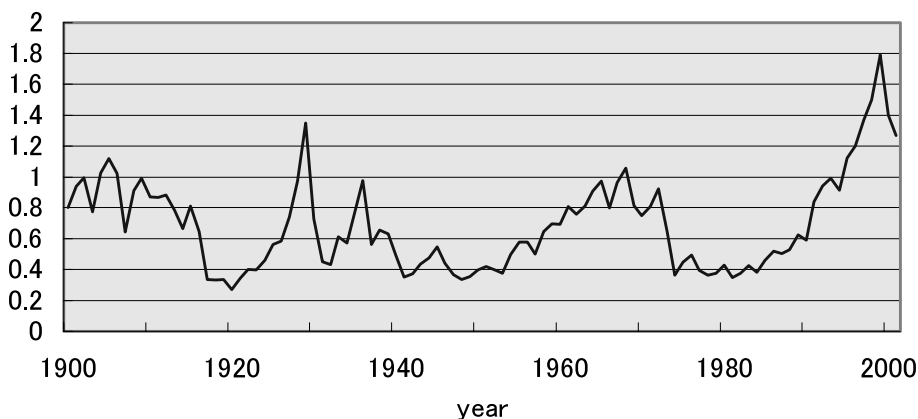
In case that the rate of profit is not equal to the rate of interest, the valuation ratio diverges from unity. This means that the securities are “quoted by the market at a price different from the value of the underlying assets” (Kahn, 1972, p. 214). The existence of valuation ratio assures the achievement of full employment (Moore, 1973, 1975).

2.4 Comments

The introduction of the valuation ratio is regarded as another long-run stabilizing factor in the growth process (Moore, 1973, 1975), therefore the existence of capital gain in the macro-economy was just a secondary interest. Judging from the contemporary perspective, however, capital gain is far from secondary interest. According to Hale (2002), the wealth loss in the US equity market since March 2002 amounted to 90% of GDP, compared with 60% during the two years after the 1929 stock market crash. This could not have happened without liberalized secondary markets.

Our purpose is to propose a tentative method to make the most of the valuation ratio in a different way from the original one in order to focus on capital gain ; we regard a divergence of the valuation ratio from unity as the accumulation of moneyed capital independently of that of real capital. In order to do so, the assumption of *constant* valuation ratio must be removed.

Figure 1. Valuation Ratio in US from 1990 to 2001



Source : <http://www.valuingwallstreet.com/>

All of the models reviewed here are built in the belief that “capital gains or losses created by a change in v are transitory” (Moore, 1973, p. 542). However, Figure 1, where the valuation ratio in US is drawn from 1900 to 2001, shows that the belief is false. Actually, the valuation ratio has been changing over time, especially since the late 1970’s, when financial deregulation began. The admittance of variability of the valuation ratio means a *revaluation* of assets in secondary markets. The progress of deregulation means that the importance of secondary markets has been steadily increasing. Therefore, capital gains or losses created by the change in v are never “transitory” at the present time, and the persistent capital gain or loss created in secondary markets, as we will show later, can be a factor in disturbing the dynamically stable full employment equilibrium path.

Furthermore, differentiating (1), we can obtain ;

$$\frac{\dot{p}}{p} = \frac{\dot{K}}{K} - \frac{\dot{N}}{N}.$$

The above formula indicates that a change in asset prices is only determined by the difference between the growth rate of real capital and that of the number of securities. Judging from the recent highly volatile fluctuation of security prices, the assumption is inappropriate.

Let us, therefore, examine what happens to the models when the assumption of a *constant* valuation ratio is removed in the next section.

3. The Variable Valuation Ratio

3.1 Kaldor model—the neo Pasinetti theorem—with the variable valuation ratio

Under the assumption of the *variable* valuation ratio, the definition of

capital gain must be amended as follows ;

$$G \equiv \dot{p}N = \dot{\nu}K + \nu\dot{K} - \dot{p}\dot{N}.$$

Therefore, the equilibrium condition in the securities market is as follows ;

$$s_w W = c (\dot{\nu}K + \nu\dot{K} - \dot{p}\dot{N}) + fgK. \quad (12)$$

By iterating the same procedures as the previous section, we can obtain ;

$$r = \frac{g + c \{ \dot{\nu} + (\nu - f)g \}}{s_c - s_w} - \frac{s_w}{(s_c - s_w)\kappa}, \quad (13)$$

$$\pi = \frac{\kappa g + c \{ \dot{\nu} + (\nu - f)\kappa g \}}{s_c - s_w} - \frac{s_w}{s_c - s_w}. \quad (14)$$

From (12) and (13), we can obtain the following differential equation ;

$$\dot{\nu} + g\nu = \frac{s_w (s_c - \kappa g) + f \{ s_c (c - 1) + s_w \} \kappa g}{c s_c \kappa}. \quad (15)$$

In the steady state, $\dot{\nu} = 0$, the rate of and share of profit in (13) and (14) are exactly equivalent to those in (5) and (6). Moreover, because $g > 0$, equation (15) has a unique equilibrium point, which is globally stable. Therefore, equations (13) and (14) are the rate of and share of profit on the dynamically stable full employment equilibrium path in a world where *revaluation* has occurred. Solving it, we can obtain ;

$$\nu_t = \xi_0 e^{-gt} + \frac{s_w (s_c - \kappa g) + f \{ s_c (c - 1) + s_w \} \kappa g}{c s_c \kappa g},$$

where ξ_0 denotes a constant of integration. The limit value exists ;

$$\lim_{t \rightarrow \infty} \nu_t = \frac{s_w (s_c - \kappa g) + f \{ s_c (c - 1) + s_w \} \kappa g}{c s_c \kappa g}.$$

The sign of ξ_0 cannot be *a priori* determined. From an economic viewpoint, however, it can be assumed as follows ; $\xi_0 < 0$. This means that the valuation ratio is a monotonically increasing function. Of course, its actual movement, as shown in Figure 1, is not smooth. First, however, we cannot derive a solution other than a sort of monotonic function due to the nature of the differential equation. Second, as mentioned earlier, we are still in an economy on the dynamically stable full employment equilibrium path in spite of the *variable* valuation ratio. These are sufficient reasons to justify the assumption that the valuation ratio is a monotonically increasing function, which has convergence.

Furthermore, the following condition is also plausible ;

$$0 < \xi_0 + \frac{s_w (s_c - \kappa g) + f \{ s_c (c - 1) + s_w \} \kappa g}{c s_c \kappa g} < 1. \quad (16)$$

This means that the initial value of the solution of (15) is positive but is less than unity. It is reasonable to assume that the accumulation of moneyed

capital is less than that of real capital in the early stage of a capitalist economy. The value of $\hat{\xi}_0$ is arbitrary as far as it is negative and the condition (16) is fulfilled.

Under the above conditions, there are two cases which should be distinguished concerning the limit value.

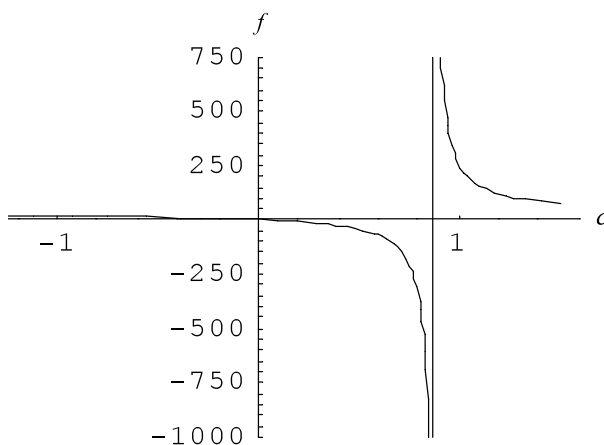
$$\text{Case 1) } 0 < \frac{s_w(s_c - \kappa g) + f\{s_c(c-1) + s_w\}\kappa g}{c s_c \kappa g} < 1$$

Transforming the above condition, we can obtain the range of f ;

$$f < \frac{c s_c \kappa g - s_w(s_c - \kappa g)}{\{s_c(c-1) + s_w\}\kappa g}. \quad (17)$$

We must take the ranges of $0 \leq c \leq 1$ and $0 \leq f \leq 1$ into account as well. The common domain is the rectangular one in the Figure 2 and 2a.⁵⁾ The latter shows a magnified figure of the former around $0 \leq c \leq 1$. As shown in the latter, the function f always divides the domain created by $0 \leq c \leq 1$, $0 \leq f \leq 1$ and a vertical asymptote, $c = 1 - s_w/s_c$, into two domains.⁶⁾ The domain (i) describes the common domain between (17) and $0 \leq c \leq 1$, $0 \leq f \leq 1$. The valuation ratio converges a value less than unity in this case.

Figure 2 .



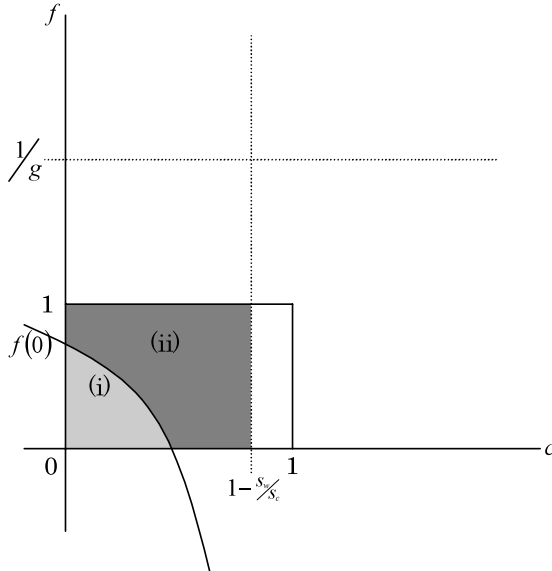
From a *purely* theoretical standpoint, the range on the vertical axis, $f = 0$, is curious ; because consumption out of capital gain is possible even though the corporation does not finance externally at all. However, a situation where a corporation does not finance externally at all in spite of a growing economy seems to be unrealistic.

5) The function drawn in the Figure 2 is (17) in the case of $s_c = 0.8$, $s_w = 0.1$, $g = 0.03$, $\kappa = 4$.

6) See Appendix B concerning the proof.

Case 2)
$$\frac{s_w (s_c - \kappa g) + f \{ s_c (c - 1) + s_w \} \kappa g}{c s_c \kappa g} \geq 1$$

Figure 2 a . Magnified Figure of Figure 2



The dashed lines in the figure denote asymptotes of function f .

Transforming it, we can obtain ;

$$f \cong \frac{c s_c \kappa g - s_w (s_c - \kappa g)}{\{ s_c (c - 1) + s_w \} \kappa g} . \tag{18}$$

In Figure 2a, the domain (ii) describes the common domain between (18), an asymptote, $c = 1 - s_w/s_c$, and , $0 \leq c \leq 1, 0 \leq f \leq 1$. The valuation ratio converges a value more than unity in this case. This case also has the same *purely* theoretical curiosity as the previous case.

3.2 Moore model with the variable valuation ratio

The definition of capital gain must be amended as follows ;

$$G \equiv \dot{p}N = (\nu - f)I + \dot{\nu}K = (\nu - 1)I + s_c P + \dot{\nu}K .$$

By iterating the same procedures as the previous section, we can obtain ;

$$I = s_c P + s_w (Y - s_c P) - c_w \{ (\nu - f)I + \dot{\nu}K \} .$$

Therefore, we can obtain ;

$$r = \frac{\{ 1 + c_w (\nu - f) \} g + c_w \dot{\nu}}{s_c (1 - s_w)} - \frac{s_w}{s_c (1 - s_w) \kappa} , \tag{19}$$

$$\pi = \frac{[\{1 + C_w(\nu - f)\}g + C_w\dot{\nu}] \kappa}{s_c(1 - s_w)} - \frac{s_w}{s_c(1 - s_w)}. \quad (20)$$

The valuation ratio is as follows ;

$$i = \frac{(1 - s_c)P}{\nu K} + \frac{(\nu - f)I + \dot{\nu}K}{\nu K}. \quad (21)$$

By iterating the same procedure, we can obtain the following differential equation ;

$$\dot{\nu} + (g - i)\nu = g - r. \quad (22)$$

Solving it, we can obtain ;

$$\nu_t = \Psi_0 e^{-(g-i)t} + \frac{g-r}{g-i}$$

where Ψ_0 is a constant of integration. Because, in the case of $\dot{\nu} = 0$, the rate of and share of profit in (19) and (20) are exactly equivalent to those in (9) and (10), it is certain that the full employment equilibrium is always achieved in the steady state. The problem left to be addressed is the stability of the equilibrium. In order to address this, we need to distinguish two cases ; one is $g > i$, the other is $g < i$. But, first of all, let us confirm that the below condition must be fulfilled in all cases because of the reason mentioned in (16) ;

$$0 < \Psi_0 + \frac{g-r}{g-i} < 1. \quad (23)$$

【Case 1 : $g > i$ 】

In this case, just as in section 3.1, equation (22) has a unique equilibrium point, which is globally stable. Therefore, in the case of $\dot{\nu} = 0$, both (19) and (20) are the rate and share of profit on the dynamic full employment equilibrium path in a world where *revaluation* has occurred. Therefore, according to the same reason as in section 3.1, it is appropriate to assume the negative sign of Ψ_0 . This means that the valuation ratio is a monotonically increasing function, which has convergence, and the value of Ψ_0 is arbitrary as far as it is negative and condition (23) is fulfilled.

$$\lim_{t \rightarrow \infty} \nu_t = \frac{g-r}{g-i}$$

We need to distinguish further two cases concerning the limit value.

$$\text{Case 1-a) } 0 < \frac{g-r}{g-i} < 1$$

In other words, it follows $r > i$. Furthermore, the following inequality *must* be satisfied ; $g > r$. Therefore, we can obtain ;

$$g > r > i. \quad (24)$$

However, this is not probable in the typical post-Keynesian growth and distribution model with two classes. Because the consumption out of profit increases effective demand and then the rate of profit has a tendency to be higher than the growth rate. This is shown in the famous phrase, which summarized Kalecki's works ; “the workers spend what they get and the capitalists get what they spend” (Robinson, 1971, p. 47). It would be true irrespective of whether the saving rate of workers has an effect on the determination of the rate of profit or not.⁷⁾

$$\text{Case 1-b) } \quad \frac{g-r}{g-i} \cong 1$$

In other words, it follows $r \cong i$, therefore we can obtain ;

$$r \cong i < g. \quad (25)$$

However, this has no economic significance because the rate of profit is lower than that of interest.

【Case 2 : $g < i$ 】

In this case, equation (22) has a unique equilibrium point, which is unstable.

The point is $\nu^* = \frac{g-r}{g-i}$, which must be positive. Therefore, it follows that $g < r$.

Though this case cannot determine, by itself, which is larger, r or i , it makes sense as far as the following is fulfilled ;

$$r > i > g. \quad (26)$$

The valuation ratio in this case has no convergence. Therefore, if the sign of Ψ_0 is negative, the valuation ratio is indefinitely decreasing over time, and the day will come when it becomes negative. In the case of $\dot{\nu} < 0$, as shown in (19), the rate of profit becomes infinitely lower than the equilibrium rate. This is a scenario of deflationary spiral, but it is of course impossible for the valuation ratio or the rate of profit to be negative. On the other hand, if the sign is positive, the valuation ratio is indefinitely increasing. In the case of $\dot{\nu} > 0$, the rate of profit becomes infinitely higher than the equilibrium rate. This is a scenario of inflationary spiral. In other words, this case corresponds to the so-called “Harrodian knife-edge.” Unfortunately, however, we cannot find any brakes on the spirals within the model.

7) Note that the rate of profit is just equal to that of growth when the capitalists accumulate all of profit (See Pasinetti, 1974). Incidentally, the rate of profit is higher than that of growth in Moss (1978, p. 309) within a reasonable range of the parameters, in which the saving rate of workers has an effect on the determination of the rate of profit.

3.3 Summary

We have examined five cases in order to analyze what happens to the models in the case of the *variable* valuation ratio. Except for the above-mentioned *purely* theoretical curiosities, it is in three cases out of five that have economic significance ; Case 1), 2) of section 3.1, in which the dynamically stable full employment equilibrium path is observed, and Case 2) of section 3.2, in which so-called “Harroddian knife-edge” is observed. The difference of the equilibrium stability is attributed to an implicit assumption that section 3.1 is a kind of security model, which Kaldor called “share,” while section 3.2 is two kinds of security models, which are not specified in the original models but we can regard them as “bond” and “share.” In a kind of security model, even if *revaluation* has occurred, the rate of change in security price is determined by the rate of growth, g , which determines the growth of real variables within such a simple linear model as the above. Therefore, a situation where the numerator of the valuation ratio grows faster than the denominator will never arise. In two kinds of security models, however, the rate of change in security price is determined not only by g but also by the rate of interest, i , which is the rate of growth in monetary variables. In the latter model, therefore, in the case of $g > i$, a situation where monetary variables grow faster than real ones will not arise, and then the valuation ratio converges. In case of $g < i$, because the rate of growth in monetary variables is higher than that of real ones, the numerator of the valuation ratio grows faster than the denominator. Therefore, the “Harroddian knife-edge” situation occurs in this case.

The most striking is Case 2) of section 3.2. First, the “Harroddian knife-edge” occurs, even though optimalization as shown in ⁽²¹⁾ is applied in the sense that the return on securities is equal to the rate of interest. Second, the derived relationship between the rate of profit, interest, and growth, shown in ⁽²⁶⁾, is probable in a capitalist economy. In a sense, this case may be seen to be similar to a “rational bubble”⁸⁾ in that both fulfill a sort of “rationality.” This suggests that this case paves the way for an analysis of economic fluctuation. In order to do so, we must impose something to act as a brake on such spirals as mentioned earlier in the model. Introducing an assumption of the neo-classical production function probably serves to avoid the “Harroddian knife-edge” situation, as it implies that the equilibrium condition for long-run growth, $g = s/k$, is fulfilled by getting rid of the disparity between the rate of profit and that of interest, and uniquely relating these rates to the capital-output ratio. However, as it has been pointed out that this concept of the production function contains some logical errors (Pasinetti, 1974), we shall not

8) See, for example, Blanchard and Watson (1982) concerning the rational bubble.

like to introduce it.

As a matter of fact, all of the models reviewed here are not free from Davidson’s famous criticism against the Kaldor model. Let us examine it in detail in the next section.

4. A Digression—Davidson’s Criticism

Davidson (1978, 2002) criticized such models as reviewed here that all of savings except corporate retention is assumed to be expended on the purchase of securities. This means a disregard for liquidity preference, *i.e.* uncertainty. Therefore, he elaborated the concept of “marginal propensity to purchase securities out of household savings,” which is denoted by $m (\leq 1)$. Therefore, the situation of $m = 1$ is special. He said ;

“If entrepreneurial expectations of sales proceeds from current production are being realized, then aggregate savings out of household income must be equal to the fraction of investment spending that is being externally financed, that is, $mS_h Y_h = iI$ and $m = 1$. Given these conditions, the equilibrium growth path (Harrod’s warranted growth rate) will be maintained while *new issues* are being floated at an equal pace with the (nonspeculative) demand for securities out of household savings.” (Davidson, 2002, p. 126, italic added, Y_h , S_h denote the household income and the public’s planned savings ratio out of household income, respectively)

He seems to think that a situation where entrepreneurial expectation of sales proceeds from current production is being realized is equivalent to $m = 1$. However, this is false. For, even if all of household savings are expended on securities, the entrepreneurs cannot realize their expectations at all when the households purchase only the existing securities, not the *newly issued* securities. According to the reflux mechanism, the entrepreneurs can only obtain profit that is equal to the amount of consumption by households and themselves, and cannot recapture the households’ savings at all.⁹⁾ He implicitly assumes only the existence of a primary market. Kaldor (1966) took account of existing securities in the secondary market but failed to take account of liquidity preference, while Davidson (1978, 2002) took account of liquidity preference but failed to take account of the existence of the secondary market.

What kind of correction, then, is needed? From the viewpoint of the reflux mechanism, the introduction of new parameter, which denotes the proportion of newly issued securities to the total purchased, is needed. Let us here denote the parameter $\lambda (0 \leq \lambda \leq 1)$. Therefore, all decision-making indispensable for savers is described in Figure 3.

9) See, for example, Rochon (1999) concerning the reflux mechanism.

Figure 3 . All Decision-making Indispensable for Savers

$$\text{Income } Y \left\{ \begin{array}{l} \text{Consumption } C \\ \text{Savings } S \left\{ \begin{array}{l} \text{Money or Bank Deposit : } 1 - m \\ \text{Securities : } m \left\{ \begin{array}{l} \text{Newly issued securities : } \lambda \\ \text{Existing securities : } 1 - \lambda \end{array} \right. \end{array} \right. \end{array} \right.$$

Davidson supposed that the expectation of sales is justified as planned savings equal planned investment ;

$$s_c P + s_h Y_h = (1-f)I + fI.$$

If m is less than unity, the below inequality can obtain ;

$$s_c P + m s_h Y_h < (1-f)I + fI.$$

If corporate savings are just equal to the internal funds to finance investment spending, we can finally obtain the below inequality ;

$$m s_h Y_h < fI.$$

In this case, the supply of newly issued securities exceeds the demand for securities out of household savings, therefore the market price of securities will fall. This means a rise in capital funding costs, which will constrain economic growth. So “there is a potential slip so that even if planned savings equals planned investment, a warranted rate of growth may not be possible to maintain” (Davidson, 2002, p. 123). However, from the viewpoint of the reflux mechanism, it is more important to compare the expenditure on the newly issued securities out of household savings, $\lambda m s_h Y_h$, with the amount of externally financed funds, fI , than to compare $m s_h Y_h$. In general, the endogenous money approach, which is based on the reflux mechanism, tends to neglect the importance of existing stock of securities.

5. Conclusion

This paper is just a tentative attempt to build a model that is appropriate to analyze such an important phenomenon as mentioned in section 1. First of all, we have confirmed that it is necessary for our purpose to regard the valuation ratio as a variable, not a constant. Then, we have examined how well the existing models of post-Keynesian theories of growth and distribution work if the *variable* valuation ratio is reinterpreted as a measure of the divergence between an accumulation of real capital and that of moneyed capital. As a result, we have found, as shown in Case 2) of section 3.2, a clue of the analysis

of the above-mentioned phenomenon. Therefore, our tentative reinterpretation of the valuation ratio is rather promising.

We can realize some problems for hereafter studies as well. The first is the need to introduce a new parameter, λ , which denotes the proportion of newly issued securities to the total purchased, the purpose of which is to properly focus on both secondary markets and the reflux mechanism. The second is a relationship between the change in the valuation ratio, *i.e.* the movement of asset prices in secondary markets, and that of the money supply. This is a very important problem because an increase in money supply was observed in countries such as Japan in the late 1980's and the US in the 1990's, where asset prices extraordinarily rose. In mainstream economics, the quantity of money supply is assumed to be exogenous. Therefore, a change in the valuation ratio in an economy where money supply is endogenous is surely the post-Keynesian theme.

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Appendix A

The purpose of this appendix is to show that the original results of Kaldor (1966) have little macroeconomic significance.

Kaldor derived the following from the equation equivalent to (3) in this paper ;

$$s_w Y - s_w rK - c\nu gK + cf gK = fgK .$$

Moreover, by adding equation (4) to the above, he derived ;

$$s_w Y + (s_c - s_w)rK - c\nu gK + cf gK = gK .$$

After rearranging the terms and dividing through by gK , he derived the following.

$$(a) \quad \begin{cases} \frac{s_w}{\kappa g} - \frac{s_w r}{g} - c\nu + cf = f \\ \frac{s_w}{\kappa g} + \frac{(s_c - s_w)r}{g} - c\nu + cf = 1 \end{cases}$$

Solving for r and ν , he derived ;

$$(b) \quad r = \frac{1-f}{s_c} g ,$$

$$(c) \quad \nu = \frac{1}{c} \left[\frac{s_w}{\kappa g} - \frac{s_w}{s_c} (1-f) - f(1-c) \right] .$$

At first glance, it seems as if the rate of profit and the valuation ratio are derived by solving a *simultaneous* system of equations (a), but this is false. The rate of profit is in fact determined differently from (a). It is determined by equation (4) in this paper, in other words, by dividing both sides of (4) by K , we can obtain the same thing as (b). Therefore, the equations in (4) are not independent. The equations in Kaldor (1966) are in fact not *simultaneous* but *recursive*. In other words, at first, equation (4) independently determines the rate of profit, and then the valuation ratio is determined by either equation in (a).

The fact that an economic model has a *recursive* system, not a *simultaneous* one, itself is not problematic at all. The problem here is what kind of macroeconomic sense the results, which are recursively derived, have. Unfortunately, we conclude that the original results have little macroeconomic significance. For the rate of profit, (b), means only an equilibrium condition of internal funds. It does not take external funds into account, therefore (b) does not depend on the valuation ratio. The same rate of profit as (b) can be derived from all the models, in which all of the internal funds are expended on the accumulation of real capital, such as in Moore, (1973, 1975), and Moss (1978). The valuation ratio in Kaldor (1966) also has little macroeconomic significance.

However, both the rate of profit and the valuation ratio in section 2.2. are derived from a macroeconomic re-

lationship, therefore they have macroeconomic significance.

Appendix B

The purpose of this appendix is to prove that the function f always divides the domain created by $0 \leq c \leq 1$, $0 \leq f \leq 1$ and a vertical asymptote, $c = 1 - S_w/S_c$, into two domains.

First of all, let us refer to the position of the asymptotes. The vertical asymptote is $c = 1 - S_w/S_c$. Because of $S_w < S_c$, it follows that $0 < 1 - S_w/S_c < 1$. The horizontal asymptote is the limit of the function f , therefore it follows that $\lim_{c \rightarrow \infty} f = 1/g > 1$ because of $g < 1$. Therefore, the horizontal asymptote exceeds unity.

Second we need to examine the positions of the intersections of f with axes. Needless to say, the intersection with horizontal axis is certainly less than unity, because the vertical asymptote is less than unity. Moreover, it is also very easy to show that the intersection, $\frac{S_w(S_c - \kappa g)}{S_c \kappa}$, is positive because of a fundamental assumption of post-Keynesian economics, $0 < S_w < \kappa g < S_c$. On the other hand, the intersection with horizontal axis, $f(0)$, is as follows ;

$$f(0) = \frac{S_w(S_c - \kappa g)}{(S_c - S_w)\kappa g} = \frac{S_c/\kappa g - 1}{S_c/S_w - 1}.$$

It is also very easy to show that $f(0) < 1$, because of the above-mentioned fundamental assumption of post-Keynesian economics.

Therefore, it is proven that the function f always divides the domain created by $0 \leq c \leq 1$ and $0 \leq f \leq 1$ into two domains. *Q.E.D.*