

The Evolution of Rate of Profit and Its Determinants in Korean Economy

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한국경제에서의 이윤율 변화와 결정요인들

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Abstract With regard to conventional theory, the rate of profit is determined by the interaction between the rate of surplus value and the organic composition of capital. And it declines with the capitalistic development through intensifying the organic composition of capital. According to the empirical test, the rate of profit and the rate of surplus value have been decreased. On the contrary, the organic composition of capital have increased during the period under study. The empirical results of the rate of profit in Korean economy appears to hold the principle of the law of the tendency of the rate of profit to fall. But the trend of the determinants is distinct from the conventional theory. Despite the distinctive empirical results, the law of the tendency of the rate of profit to fall is realized in Korean economy in objective period of time.

Key Words : Rate of Profit, Rate of Surplus Value, Organic Composition of Capital, Law of the Tendency of the Rate of Profit to Fall, Periodization

요 약 전통적 이론에 의하면 이윤율은 일반적으로 자본의 유기적 구성과 잉여가치율 사이의 상호작용에 의해 결정된다. 그리고 이윤율은 자본주의적 발전과 함께 자본의 유기적 구성이 심화됨으로써 저하하는 것이다. 실증분석에 의하면 이윤율과 잉여가치율은 각각 저하한 반면 자본의 유기적 구성도는 상승한 것으로 나타났다. 실증분석의 결과를 볼 때 한국경제에서는 이윤율 저하경향의 법칙이 관철되는 것으로 보인다. 그러나 그 결정요인들의 추세는 전통적 이론에서와는 다른 것으로 나타났다. 이러한 차별적인 추정결과에도 불구하고 분석 대상 기간 동안 한국경제에서 이윤율 저하경향의 법칙이 실현된 것으로 나타났다.

주제어 : 이윤율, 잉여가치율, 자본의 유기적 구성도, 이윤율 저하경향의 법칙, 시기구분

1. Introduction

According to conventional theory, the rate of profit

is determined by the interaction between the rate of surplus value and the organic composition of capital. The rate of profit declines with the capitalistic

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development through intensifying the organic composition of capital. This tendency is called “the law of the tendency of the rate of profit to fall”[1].

We are concerned with the concept of the organic composition of capital and the rate of surplus value because the trend of profit rate totally depends on the changes of the two determinants. Especially, the organic composition of capital is an extremely important concept because it is central in some of the analysis of this paper. And also it is essential to the discussion of the law of the tendency of the rate of profit to fall.

The discussions of the movement of profit rate have been occupied by Marxian theorists. Their main argument is that the rate of profit would tend to decline over the long run. Thus the “law of the tendency of the rate of profit to fall” states that over time the organic composition of capital would rise, thereby causing the general rate of profit to fall.

This paper analyses the effect of the rate of surplus value and the organic composition of capital upon the rate of profit and the characters of the evolution of profit rate in Korean economy in the period of 1970–2011.

In the empirical results of this paper, we can find out that the declining trend of profit rate was continuous over time, and there were periods when the organic composition declined quite sharply. Moreover, We find that the profit rate fell between 1970 and 1987 and it was steady tone by 1994 and then it dropped again until 2008. The decline in the period of 1970–1994 is traceable to a declining rate of surplus value and another declining period of 1994–2011 is due to a sharp rising of the organic composition of capital.

This paper is organized as follows. Section two presents a brief survey of previous discussions on three main rations. Section three addresses the definition of variables, accounting framework, and statistical data. Section four implements the empirical test and analyses the evolutions of the rate of profit during the period of

1970–2011. Finally, the last section concludes with a brief review of the results and implications for further research.

2. Previous Literatures

This paper investigates the rate of profit in Korea between 1970 and 2011. As a main empirical results of this paper, there was very little change in the economy wide surplus value over that period. In terms of the organic composition of capital, the trend was made up of two opposed tendency centering around the reference year of 1994. Despite the twofold tendency, the profit rate fell continuously overtime. With regard to the rate of profit during the whole period under study, it was declined by 58% as a whole. The evolution of profit rate seems to be determined by the magnitude of the ratio and interaction between the rate of surplus value and the organic composition of capital.

In comparison with the empirical results of this paper, Thompson(1988) argues that a rising composition of capital does not drive a falling rate of profit[2]. If anything, he continues, a rising composition of capital drives a rising rate of profit. In other words, a rising composition of capital is a countervailing tendency to any tendency of the rate of profit to fall. For a rise in the composition of capital, while keeping other variables constant, lowers the demand for labor, which lowers the real wage rate and raises the rate of profit.

Similar to the Thomson’s conclusion, Laibman(1996) states that the rise in the technical composition reduces the demand for labor[3]. Accordingly, he argues, in the absence of sufficient accumulation, it is impossible that rationally chosen new techniques can lower the rate of profit. And therefore the actual or potential rise in real standards of living of the working class, as a result of growing productivity, he anticipates, could be the most basic contradiction.

Analysing the growth of Brazilian economy during 1953~2003, Marquetti et. al.(2010) considered that the rate of profit is measured by the ratio between the total profits created during a period of time to total advanced capital[4]. Conclusively, they summarized that the profit rate presented a downward trend from 1953 to the very beginning of 1990s, and from then on its trend was slightly upwards. And the main determinant of the falling profit rate was declining capital productivity.

Considering that the empirical research is limited in number and confined to the mature capitalist economies of the West, Lianos(1992) found that the rate of profit of the Greek manufacturing sector has followed the behavior of the rate of surplus value with minor influences from the organic composition of capital[5]. The organic composition of capital is the only variable that follows a mild increasing trend. This results are opposed to the determinants of Korean economy.

Using a conventional national accounting framework, Wolff(2001) made an empirical analysis the rate of profit of U. S. economy for the period of 1947~1997[6]. He found the decline in the rate of profit is traceable to a rising organic composition of capital and a decline in the profit share, and the recent recovery to a declining organic composition and a rising profit share.

In his recent research, Wolff(2010) found that the rate of profit surged upward, reaching 21.2% in 2006, close to its postwar high of 22.7% in 1948, though it dipped a bit to 20.7% in 2007[7]. He interpreted these results as a clear evidence that the stagnation of labor earnings in the U.S. since the early 1970s has translated into rising profits in the economy.

Besides the two ratios such as the rate of surplus value, and composition of capital, there are some assertion that the main cause of the decline in the rate of profit is the relative proportion of unproductive labor and the ratio of unproductive capital to variable capital.

Meanwhile Moseley(1990) presented an explanation of the decline of the rate of profit in the postwar U.S. economy which is based on the distinction between

productive labor and unproductive labor[8]. According to his argument, the conventional rate of profit depends on the rate of surplus value, the composition of capital, and the ratio of unproductive labor to productive labor.

On the basis of empirical analysis, Moseley(1990; 1992) argues that the proximate causes of the decline in the rate of profit in the postwar U. S. economy were the significant increases in the composition of capital and in the two ratios of unproductive capital to variable capital[9]. He argues that this very significant increase in the ratio of unproductive labor to productive labor was the most important cause of the decline of the rate of profit in the postwar U.S. economy.

Basically accepting the view of Moseley on the role of unproductive labor in the rate of profit, Laibman(1993) pointed out that Moseley does not in fact offer a theoretical distinction between productive and unproductive labor. Nevertheless he admitted Moseley's conclusion that the most important cause of the decline in the rate of profit was the increase in the ratio of unproductive capital to variable capital.

In corresponding to the comments of David Laibman(1993) called into question on the relation between unproductive labor and the rate of profit[10], Fred Moseley(1994) presupposes that unproductive labor is consistent with the profit maximization of individual firms[11]. Due to objective forces in the economy, he continues, firms increase unproductive labor in order to increase their individual rate of profit or to avoid an even greater decline in the rate of profit, but the overall effect of these individual decisions for the economy as a whole is to reduce the general rate of profit.

In another empirical test, Moseley(1997) argues on the one hand that the trend in the rate of surplus value depends on the relative rates of increase in productivity and real wages and that the future trend in the rate of profit would seem to depend mainly on the trend in the ratio of unproductive labor to productive labor on the other[12].

On the discussion of productive labor, Wolff (1994) called into question on the issue of whether the distinction between productive and unproductive labor is useful today[13]. Conclusively, he maintain the distinction between productive and unproductive labor serves as a useful dichotomy for analyzing important structural changes in advanced capitalist economies. And also he supports the Moseley's position that the fall for of the profit rate in the U.S. can be attributed to the relative increase in unproductive labor.

According to the views presented above, the evolution of profit rate is determined by the organic composition of capital, the trend of the rate of surplus value, and the ratio between productive labor and unproductive labor. But due to its complexity, and analysis of this important question of unproductive labor is beyond the scope of this paper. Further research along these lines should obviously be devoted to extending the explanation of the decline in the profit rate by identifying the relative increase of unproductive labor. Thus, in this paper, we are going to make an empirical analysis on the rate of profit, the rate of surplus value, and the organic composition of capital on the period of 1970-2011.

3. Definition of Variables, Accounting Frameworks and Statistical Data

3.1 Definitions of Variables

To avoid confusion in estimating the main three ratios through which we are going to analyse the trends of profit rate, it is indispensable to make a clear definition on a several terms, such as surplus value, constant capital, and variable capital.

Surplus value is the difference between the value of the product and the value of the elements consumed in the formation of the product, in other words the means of production and the labor power[14].

Constant capital is the part of capital which is turned

into means of production, i.e. the raw material, the auxiliary material and the instruments of labour, does not undergo any quantitative alteration of value in the process of production.

On the other hand, variable capital which is turned into labor power, and it undergoes an alteration of value in the process of production. It both reproduces the equivalent of its own value and produces an excess, a surplus value, which may itself vary, and be more or less according to circumstances. This part of capital is continually being transformed from a constant into a variable magnitude.

From those clear cut definitions above, we can now derive the following three main ratios, such as the rate of surplus value, the organic composition of capital, and the rate of profit. The rate of surplus value means the relative quantity produced, or the ratio in which the variable capital has valorized its value, and is determined by the ratio of the surplus value to the variable capital.

And the organic composition of capital, in terms of value, is determined by the proportion in which it is divided into constant capital and variable capital. As material, as it functions in the process of production, all capital is divided into means of production and living labour power. This latter composition is determined by the relation between the mass of the means of production employed on the one hand, and the mass of labour necessary for their employment on the other.

The former is called as the value composition, and the latter as the technical composition of capital. Actually there is a close correlation between the two. In so far as the value composition of capital is determined by its technical composition and mirrors the changes in the latter, it is called the organic composition of capital.¹⁾

The rate of profit is defined as the ratio of the

1) "The proposition constitutes the technical composition of capital, and it the actual basis of its organic composition."(K. Marx 1991, p. 244).

surplus value to the total capital which is the sum of constant capital and variable capital. The surplus value or profit consists precisely in the excess of commodity value over its cost price, i. e. in the excess of the total sum of labor contained in the commodity over the sum of labor that is actually paid for. We can obtain the rate of profit as a ratio of surplus value to the total capital.

Total capital is defined by the sum of constant capital and variable capital. Thus the rate of profit is different from the rate of surplus value. In other words, the rate of surplus value, as measured against the variable capital, is known as the rate of surplus value; the rate of surplus value, as measured against the total capital, is known as the rate of profit[1].

3.2 Statistical Data

To make the analysis more accessible, we use a national accounting framework. All the statistical data is from the "National Account" presented by public institute of "Statistics Korea"[15] designated agency of Bank of Korea[16]. All the values are based on nominal terms and the reference year is 2005. Statistical data used here is located at the section of National Account which is under the sub-item of Economic Statistic System and the main data is classified as the "Gross Value Added and Factor Income by Kind of Economic Activity." The "Gross Value Added and Factor Income by Kind of Economic Activity" is composed of eight factors such as Gross Output, Intermediate Consumption, Gross Value Added, Other Taxes on Production (less) Other Subsidies on Production, Consumption of Fixed Capital, Domestic Factor Income, Compensation of Employees, and Operating Surplus.

According to the main table, the Gross Output (A) is the sum of Intermediate Consumption (B) and Gross Value Added (C). This is expressed by the following algebraic formula.

$$A = B + C \quad (\text{eq. 1})$$

And the Gross Value Added (C) is composed of

Other Taxes on Production (less) Other Subsidies on Production (D), Consumption on Fixed Capital (E), and Domestic Factor Income (F). The Gross Value Added is derived by the sum of these three items as the following formula.

$$C = D + E + F \quad (\text{eq. 2})$$

And also the Domestic Factor Income (F) is composed of Compensation of Employees (G) and Operating Surplus (H), and is derived by the sum of these two items.

$$F = G + H \quad (\text{eq. 3})$$

Finally, we can get the following formula as a consequence of these relationship among the components of this section.

$$A = B + D + E + G + H \quad (\text{eq. 4})$$

This means that the Gross Output is the sum of Intermediate Consumption, Other Taxes on Production (less) Other Subsidies on Production, Consumption on Fixed Capital, Compensation of Employees and Operating Surplus.

By the definitions of variables above, we can summarize the constant capital c , variable capital v , and surplus value s as follows:

$$\text{constant capital : } c = B + E \quad (\text{eq. 5})$$

$$\text{variable capital : } v = G \quad (\text{eq. 6})$$

$$\text{surplus value : } s = D + H \quad (\text{eq. 7})$$

According to the algebraic formulas above, the Gross Output is the sum of constant capital c , variable capital v , and surplus value s .

3.3 Accounting Frameworks

For the empirical test, the following definitions are used.

$$\text{Rate of surplus value} = \frac{s}{v} \quad (\text{eq. 8})$$

where s = surplus value, v = variable capital, the total compensation of workers.

$$\text{Organic composition of capital} = \frac{c}{v} \quad (\text{eq. 9})$$

where c = stock of constant capital and flow of

intermediate inputs.

$$\text{Rate of profit} = \frac{s}{c+v} = \frac{\frac{s}{v}}{\frac{c}{v}+1} \quad (\text{eq. 10})$$

This formula means that the determinants of the rate of profit is the rate of surplus value and the organic composition of capital. And also the profit rate is determined by the interaction between $\frac{s}{v}$ and $\frac{c}{v}$. On the basis of the available data, we do not distinct between productive and unproductive labor. We are now ready to estimate the three main ratios, such as the rate of surplus value, the organic composition of capital, and the rate of profit from the following section.

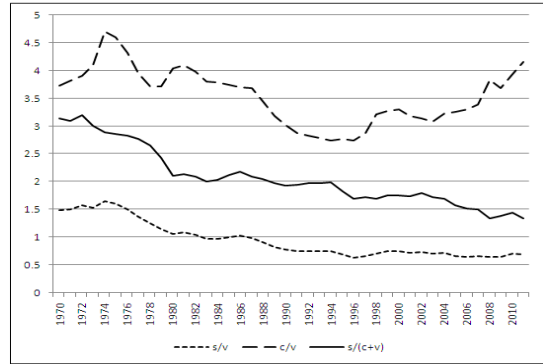
4. The Empirical Results: The Evolution of the Profit Rate and Its Determinants

4.1 The Empirical Results

According to the Appendix 1 and [Fig. 1], the main results of our empirical test are as follows. In the period of 1970–2011, the rate of profit decreased 58%, from 1.48 in 1970 to 0.69 in 2011. The rate of surplus value decreased significantly 53%, from 1.48 in 1970 to 0.69 in 2011. Contrast to the trend of rate of surplus value, the organic composition of capital increased 11%, from 3.72 in 1970 to 4.16 in 2011. Considering that the profit rate is determined by the rate of surplus value and the organic composition of capital, the main cause of the declining of the rate of profit is the interaction between the ratios of slight increase of the organic composition of capital by 11 percent and the remarkable decrease of the rate of surplus value by 53 percent.

There were two phases in the behavior of the organic composition of capital. In the first phase, between 1970 and 1994, it rapidly declined. In the second phase, from 1994 to 2011, it increased significantly. During the earlier phase, the rate of surplus value declined remarkably. On the contrary, the

trend of the rate of surplus value of second phase showed a steady tone while the organic composition of capital rose rapidly.



[Fig. 1] The Evolution Three Main Ratios²⁾

4.2 Comments

4.2.1 Periodization

With regard to the rate of profit, we are going to divide the whole period by two phases. This periodization is based on the importance of the organic composition of capital in estimating the rate of profit. Generally the organic composition of capital increases with the capitalist development through intensifying the constant capital. In spite of this general tendency, the case of Korean economy reveals two distinctive phenomena. The first phase of objective period is inconsistent with the conventional explanation. On the contrary, the period of second phase from 1994 to 2011, the tendency of the organic composition of capital holds the explanation of conventional theory. Based on this opposite tendency of the organic composition of capital, the time profile of this ratio is divided into two main phases.

The first phase is characterized by 26 percent

2) The three ratios refer to the rate of surplus value s/v , organic composition of capital c/v , and the profit rate $s/(c+v)$, where the rate of profit is multiplied by ten for the precise comparison.

note: Statistics Korea: <http://kostat.go.kr>; Bank of Korea: <http://ecos.bok.or.kr>.

decrease of the organic composition of capital between 1970 and 1994. Instead of the decline of the organic composition, the rate of profit declined significantly by 38 percent during the period of 1970–1994.

Second phase is characterized by the remarkable increase in the organic composition of capital by 51 percent between 1994 and 2011. Due to the significant increase in the organic composition, the rate of profit declined 31 percent during the period of 1994–2011. Considering the slight decrease in the rate of surplus value, the main cause of the decrease of profit rate should be the increase of the organic composition of capital.

4.2.2 First Phase: 1970–1994

In the first phase of 1970–1994, the rate of surplus value decreased 50 percent, from 1.48 in 1970 to 0.74 in 1994 and the organic composition of capital decreased 26 percent, from 3.72 in 1970 to 2.74 in 1994. Due to the significant decreasing effect of the fallen rate of surplus value, the rate of profit decreased 38 percent, from 0.31 in 1970 to 0.19 in 1994 in spite of the increasing effect of the decreased organic composition of capital. In other words, the decrease of the organic composition of capital by 26 percent is offset by the remarkable decrease of the rate of surplus value over the same period by 53 percent, which is the main cause of the decline of the profit rate. In accordance with the interaction of the two ratios, the rate of profit declined approximately 38% from 1970 to 1994.

4.2.3 Second Phase: 1994–2011

In the period of 1994–2011, the rate of surplus value decreased 6 percent, from 0.74 in 1994 to 0.69 in 2011. And also the organic composition of capital increased significantly 51 percent, from 2.74 in 1994 to 4.16 in 2011. Both the decrease of the rate of surplus value and the increase of the organic composition of capital are the causes of the decrease of the rate of profit. As a result, the rate of profit decreased 31 percent, from 0.19

in 1994 to 0.13 in 2011. During this period, we can recognize that the recovered falling rate of surplus value from 50 percent in first phase to 6 percent in second phase draws the lowered the decrease of the profit rate. Especially, the main cause of the decrease of profit rate in the second phase is significantly increased organic composition of capital by 51 percent rather than the slightly decreased rate of surplus value.

5. Conclusion

As we have seen above, the empirical investigation on the period of 1970–2011 presents us the following facts. There was very little change in the economy wide surplus value over that period. In terms of the organic composition of capital, we found two different trends. First phase of declining of the organic composition of capital was found between 1970 and 1994, and from that time on the second phase of increasing trend has continued by 2011.

According to the results of this empirical test as a whole, the rate of profit decreased 58 percent, from 1.48 in 1970 to 0.69 in 2011. The rate of surplus value decreased significantly 53 percent, from 1.48 to 0.69. Contrast to the trend of rate of surplus value, the organic composition of capital increased 11 percent, from 3.72 to 4.16. Considering that the profit rate is determined by the rate of surplus value and the organic composition of capital, the main cause of the declining of rate of profit is the interaction between the ratios of slight increase of the composition of capital by 11 percent and the significant decrease of the rate of surplus value by 53 percent.

Our conclusion can be summarized as follows. The empirical results of the rate of profit in Korean economy appears to hold the principle of the law of the tendency of the rate of profit to fall. But the trend of the determinants is quite distinct from the conventional theory in that the declining tendency is observed in the

same period of the organic composition of capital is declining in 1970-1994. And also almost all the period, the rate of surplus value was not increased at all. Despite the distinctive empirical results made above, the law of the tendency of the rate of profit to fall has been realized in Korean economy in objective period of time.

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Appendix 1.

Profit Rate, Rate of Surplus Value, Organic Composition of Capital (1970–2011)

	$s/(c+v)$	s/v	c/v
1970	0.3138	1.4829	3.7250
1971	0.3105	1.4969	3.8203
1972	0.3204	1.5738	3.9119
1973	0.3007	1.5336	4.1010
1974	0.2887	1.6467	4.7035
1975	0.2868	1.6056	4.5984
1976	0.2830	1.5059	4.3214
1977	0.2779	1.3749	3.9469
1978	0.2655	1.2506	3.7109
1979	0.2440	1.1495	3.7112
1980	0.2113	1.0657	4.0437
1981	0.2149	1.0967	4.1041
1982	0.2090	1.0419	3.9847
1983	0.2011	0.9670	3.8093
1984	0.2043	0.9792	3.7924
1985	0.2120	1.0051	3.7406
1986	0.2183	1.0262	3.7001
1987	0.2098	0.9827	3.6831
1988	0.2059	0.9167	3.4518
1989	0.1986	0.8302	3.1800
1990	0.1941	0.7820	3.0299
1991	0.1946	0.7534	2.8724
1992	0.1974	0.7574	2.8373
1993	0.1986	0.7517	2.7843
1994	0.1995	0.7472	2.7448
1995	0.1832	0.6915	2.7751
1996	0.1694	0.6353	2.7502
1997	0.1727	0.6695	2.8770
1998	0.1695	0.7157	3.2219
1999	0.1756	0.7502	3.2720
2000	0.1761	0.7586	3.3074
2001	0.1740	0.7278	3.1828
2002	0.1799	0.7439	3.1362
2003	0.1734	0.7085	3.0861
2004	0.1700	0.7195	3.2313
2005	0.1575	0.6704	3.2570
2006	0.1519	0.6534	3.3011
2007	0.1505	0.6612	3.3923
2008	0.1345	0.6503	3.8347
2009	0.1396	0.6544	3.6868
2010	0.1449	0.7159	3.9389
2011	0.1348	0.6957	4.1601