

THE CIRCUIT OF INDUSTRIAL CAPITAL, PRICE CHANGES AND THE PROFIT RATE

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Abstract

In this paper we analyze, from the TSS perspective, the effects of price changes on the profit rate of a given industrial capital. Firstly, we argue that the analysis of the effects of prices change must be done utilizing the concept of the circuit of industrial capital. Secondly, we show that from the standpoint of industrial capital prices changes not only affect the profit rate but it also affect - through the phenomena of revaluation/devaluation and release/tying-up of capital, and their reciprocal interrelationship - the amount of total capital advanced to the reproduction process.

1- Introduction

The aim of this paper is to discuss the effects of price changes upon the reproduction process of an individual industrial capital and on its profit rate. We will show that the effects of the input's price change upon the amount of capital advanced and upon the profit rate depend crucially on the stages of the industrial capital's circuit, since price change may give rise to the phenomena of appreciation/devaluation and/or release/tying-up of capital.

The analysis developed below will also show the strength of the TSS approach as compare with the simultaneist approach, which is not capable of perceiving the emergence of these phenomena¹.

This paper is organized as follows: section 2 presents, very briefly, the circuit of an industrial capital, which is the basic analytical tool for our analysis and also describes the phenomena of release tying up and the revaluation and devaluation of capital. In section 3 we analyze the effects of input's price changes upon the reproduction process and on the profit

¹ In the "transformation problem" debate this deficiency of the simultaneist approach also shows up. Because the phenomena of release and tying up of capital is not taken into consideration, it creates the illusion that Marx's procedure is logically inconsistent, even though it is not. See, for example, Maldonado-Filho, 1997.

rate. Section 4 deals with, very briefly, the concepts of devaluation of fixed capital and moral depreciation.

2 - The Circuit of Industrial Capital and the Phenomena of Release and Tying up and the Revaluation and Devaluation of Capital

As it is well known, according to Marx industrial capital assumes, in the course of its circuit, three distinct forms: money-capital (M), productive capital (P), and commodity-capital (C'). As a matter of fact, these three forms assumed by capital-value exist not only in succession but they also coexist side by side. The circuit of industrial capital can be described as follows :

$$M - C\{MP, LP\} \dots P \dots C' - M'$$

This circuit begins with the capital-value in its money form (M). With a given amount of money the capitalist goes to two different markets: the commodities market (where he purchase the means of production necessary to produced his commodities) and the labor market (where he buys labor-power). In this way the transforms his capital-value from money into productive form. In its productive form the capital-value also appears in its dual aspect of being use-values (labor process) and value (valorization process). That is to say, productive capital, P, insofar as its material aspect is concerned, assumes the forms of means of production (MP) and concrete living labor (L). Whereas considered from its aspect of value (i.e. as a valorization process), productive capital assumes the forms of constant capital (C) and variable capital - living abstract labor². Thus the new commodities produced (C') have a total value which equals the value of the means of production transferred to the final product plus living labor employed (V + S) during the process of production, thus the total value of the commodity capital is: $C' = C + (V + S)$. Part of the new value created only reproduce the value of labor power bought (V) and the other part is the surplus-value (S) appropriated by the capitalist. In possession of the new commodities produced (C'), the capitalist return to the sphere of circulation in order to sell them and thus to transform his capital-value from the commodity into money form again. With the successful completion of the circuit, the capitalist

² Although the concept of variable capital plays a crucial role in Marx's analysis there is no consensus on its interpretation. As we understand it, capital only becomes variable capital when it assumes its form of living labor. As Marx (1991, vol. 33, p.106). points out, "[b]ut the law of development of capitalist production ... consists precisely in the continuous decline of variable capital, i.e., the part of capital laid out in wages, in return for living labour - the variable component of capital - in relation to the constant component of capital...".

must start this circuit again. Assuming that everything else (turnover time, technology, scale of production, prices of inputs, working-day, etc.) remain constant, the reproduction process will continue undisturbed.

But what happens with the reproduction process of this industrial capital if the input's prices change? According to Marx, change in the price of inputs brings about either the phenomena of appreciation and devaluation of capital or the phenomena of release and tying up of capital³. These changes, as we will see, affect both the magnitude of capital advanced and the profit rate.

In order to explain these concepts, let us assume an industrial capital which has the following circuit and examine what would happen if, at the beginning of the second turnover period, the price of the means of production (MP) had fallen by, say, half. Assuming that this circuit, before the fall in the price of the MP, was as follows⁴:

$$(1) \quad M(\$100) - C \left\langle \begin{matrix} MP(\$80) \\ LP(\$20) \end{matrix} \right\rangle \dots P \dots C'(\$120) - M'(\$120)$$

Due to reduction of the price of the MP the capitalist, assuming that the scale of production remains the same, will buy the same amount of the MP by \$40 (instead of the \$80 advanced earlier on) and the same amount of labor power by \$20 (assuming that the price of labor power is unchanged). Therefore, the circuit of this industrial capital during its second turnover period can be represented as follows:

$$(2) \quad M(\$60) - C \left\langle \begin{matrix} MP(\$40) \\ LP(\$20) \end{matrix} \right\rangle \dots P \dots C'(\$80) - M'(\$80)$$

3 It should be pointed out that we will focus our attention on the emergence of these phenomena when it results from the changes in the price of the elements of the labor process (i.e. means of production, MP, and labor-power, LP). Therefore, other factors which may also bring about the release and tying up of capital - such as variation in the turnover time, increase in the productivity of labor, etc. - will not be analyzed.

4This example is taken from Marx (1978b, p. 344), where he presents the following example: "Let us now consider the manufacturer. Let us assume that he has laid out \$100 in cotton twist and made a profit of \$20. The product therefore amounts to \$120. It is assumed that \$80 out of the outlay of \$100 has been paid for cotton. If the price of cotton falls by half, he will now spend only \$40 on the cotton and \$20 on the rest, that is \$60 in all (instead of \$100) and the profit will be \$20 as previously, the total product will amount to \$80 (if he does not increase the scale of production). \$40 thus remain in his pocket. He can either spend it or invest it as additional capital". From this example Marx thus concludes that "what this phenomenon amounts to is this: release of a portion of the capital previously tied up in constant capital, or the conversion of a portion of the capital into revenue" (Marx, 1978b, p.344-345).

The reduction in the price of the MP, everything else remaining constant, results in the release of an amount of \$40 of constant capital. It should be indicated that, since this capital-value has not been returned to the production process in the second turnover period, it cannot be transferred by labor to the final product. As a consequence, the commodity capital, although it remains unchanged in terms of use-values, has its total value declined from \$120 to \$80; that is, the reduction of the total value of the commodity capital equals the amount of constant capital which were released from production and which is kept in capitalist's 'pocket'.

It should be pointed out at this point that Marx defines release and tying up of capital as follows:

'By the tying-up of capital we mean that, out of the total value of the product, a certain additional proportion must be transformed back into elements of constant and variable, if production is to continue on its old scale. By the release of capital we mean that a part of the product's total value which previously had to be transformed back into either constant and variable capital becomes superfluous and superfluous, should production continue on the previous scale.' (Marx, 1981b, p.206).

If the price of the MP had become dearer then the capitalist would have either to tie up additional constant capital in order to keep the scale of production constant or to reduce the scale of production.

Now, we are going to examine the consequences for the industrial capital if the value of the labor-power, as a result of the decrease in the value of the workers' means of consumption, falls from \$20 to \$10. More specifically, let us assume that, in our first example of the circuit of industrial capital, the capitalist, by advancing \$20 as variable capital, could employ 50 workers, but in the second turnover period he has to advance only \$10 in order to employ the same 50 workers. If we assume further that the working day and the intensity of labor remain unchanged, then the same number of workers (50) will still incorporated a new value of \$40. However, \$10 of the new value created will reproduce the variable capital advanced, and consequently the surplus-value will be equal to \$30. In other words, the rate of surplus-value will increase from 100% to 300%. The circuit of the industrial capital at its second turnover period will be as follows⁵:

5 "If wages fall in consequence of a depreciation in the value of labor-power ..., a portion of the capital hitherto invested wages is released. Variable capital is set free. In the case of new investments of capital, this has simply the effect of its operating with a higher rate of surplus-value... But in the case of already invested capital, not only does the rate of surplus-value rise

$$(3) \quad M(\$90) - C \left\langle \begin{matrix} MP(\$80) \\ LP(\$10) \end{matrix} \right\rangle \dots P \dots C' (120) - M' (\$120)$$

Therefore, as we have seen above, for Marx the release or tying up of variable capital does not result in any change in the total value of the commodity capital - as it is the case with the constant capital - but it does bring about modifications in the rate of surplus-value and in the total capital advanced.

Let us now examine the concepts of revaluation and devaluation of constant capital. According to Marx:

"Revaluation and devaluation [of capital], on their part, are self-explanatory. We simply mean that the capital present increases or decreases in value as the result of certain general economic conditions (since what is involved here is not the particular fate of one single capital), i.e., that the value of the capital advanced to production rises or falls independently of its valorization by the surplus labour it employs." (Marx, 1981b, p. 206)

We may now return to the circuit of capital (1) and assume that, after the capitalist has purchased the MP, their values increase. Then, as a consequence, the value of the productive capital (i.e., the MP purchased) also rises and this appreciation of the productive stock is called by Marx as revaluation of constant capital. In terms of the circuit of capital (1), the consequence of the rise by half in the value of the MP, after the capitalist has purchased them, is as follows:

$$(4) \quad M(\$100) - C \left\langle \begin{matrix} MP(\$80) \\ LP(\$20) \end{matrix} \right\rangle \dots P \{ \$120c + \$40(v + s) \} \dots C' (\$160) - M' (\$160)$$

Because the value of the MP is greater after than before the purchase is made by the capitalist, the value of the commodity capital increases accordingly. It is clear that, in this case, the continuity of production at the same scale does not imply on the release of capital - this would happen only if the price of the MP would have fallen when the capitalist returns to the market to buy again the MP. However, the tying up of additional capital, which is necessary to continue production at the same scale, comes from capitalist own revaluated capita-value.

but a portion of the capital already invested in wages is also released. Until this time it was tie up and formed a regular portion which had to be deduced from the proceeds for the product and advanced for wages, acting as variable capital if the business were to continue on its former scale. Now this portion is set free and may be used as a new investment, be it to extend the same business or to operate in some other sphere of production" (Marx, 1977b, p.114-5).

On the other hand, if the input price declines (say, by half) after the purchase has been made there occurs a devaluation of the productive stock. The consequence of the devaluation of constant capital is that, in order to continue production on the same scale, the capitalist has to tie up additional on the same amount of the capital-value lost (\$40). In terms of the circuit of capital, we would have that:

$$(5) \quad M(\$100) - C \left(\begin{smallmatrix} MP(\$80) \\ LP(\$20) \end{smallmatrix} \right) \dots P \{ \$40c + \$40(v + s) \dots C' (\$80) - D' (\$80)$$

Revaluation and devaluation of variable capital Marx understands that

"In as much as the value of labour-power rises because the value of the means of subsistence required for its reproduction rises, or conversely falls because of the value of these means of production falls (and a revaluation or devaluation of the variable capital can mean nothing more than these two cases), and assuming that the working day remains constant, a revaluation of this kind means a fall in surplus-value and a devaluation means a rise" (Marx, 1981b, p. 209-10).

In other words, Marx is saying that a revaluation/devaluation of variable capital occurs when the price of the means of subsistence changes but the real wage remains constant. This would be the case, for example, when the wages are fully and ex-post indexed to the price of the MS. Otherwise these prices change will bring about the release and tying up of revenue (in this case, of the wages). If we assume that the nominal wage is kept constant, then a rise in the price of the MS will result either in a tying up of revenue (say, the worker uses his savings "in order to continue with the same mode of life") or in a reduction in his standard of living. On the other hand, if the prices of the MS decline whereas the nominal wage remains constant then a portion of the nominal wages is set free if the worker decides to keep the same standard of living (in this case, he can save the amount released either to increase consumption later or to save money as a 'precautionary motive') or the worker may decide to use the revenue released to increase his consumption now.

3 - Changes in the Prices of Inputs and Their Effects on the Reproduction Process and on the Profit Rate

Let us examine the circuit of an industrial capital that has the following characteristics: (1) the turnover time is 5 days, whereas the time of circulation is zero; (2) working-day = 8h; (3) technology: in 1h of labor the average worker consumes 1 ton. of iron to produce 3 kg of

gold; (4) real daily wage per worker = .5 kg of corn; (5) price of corn = \$4; (6) price of iron = \$2; (7) MELT: \$1 = 1h of abstract labor; (8) constant capital advanced = \$160 and (9) variable capital advanced = \$ 20.

Let us assume that at time t=1 the capitalist buys at the commodities market 80 ton of iron (thus forming a productive stock of iron which will be consumed in the next 5 days) and hires 2 workers for the next 5 days (for the sake of simplicity, let us assume that the capitalist advances the total amount of wages, \$20, at the begin of the five days contract). Therefore, by doing this, the capitalist transforms the greater part of his money capital (\$180) into productive capital (from the material side, P = 80 ton of iron + 80 h of concrete labor; from the value perspective, P = \$80c + \$80(v+s)). Now, the whole capital-value will exist for the next 5 days as productive capital. At the end of the 5th day, the workers will have produced 240 kg of gold (commodity capital) whose value is equal to \$240. When production is completed, at the end of the 5th day, the capitalist sells his commodity capital and receives \$240. He then completes the first turnover and receives back the capital originally advanced (\$180) and realizes the surplus value created during the production process (\$60). The rate of surplus value, $s' = \$60/\$20 = 300\%$, and the profit rate, $r = \$60/(\$160c + \$20v) = 33.33\%$. Assuming that everything else remains constant, at the 6th day the capitalist start a new production with his capital of \$180 and the surplus value is, say, spend as revenue. The circuit of this industrial capital may be represented as follows:

$$M(\$180) - C \left\{ \begin{array}{l} MP= 80i \cdot \$2 = \$160 \\ LP= 2w \cdot \$4 \cdot 5wd = \$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i + 80h \rightarrow 240g \\ \$160c + \$80(v+s) = \$240 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g = \\ \$160c + \$80(v+s) = \$240 \end{array} \right\} - D'(\$240)$$

HYPOTHESIS 1: price of iron changes after the capitalist has purchased it.

But let us now assume that, at the 6th day (when the second period of reproduction starts), just after the capitalist has bought the MP and LP, the price of 1 ton of iron increases from \$2 to \$3. The consequence of this increase is that the productive stock of iron is revaluated - in other words, there occurs a revaluation of MP. What will happen with the circuit of this capital?

Thus, at the beginning of the 6th day the capitalist goes to the commodities markets and advances \$160 to purchase 80 ton of iron and \$20 to hire 2 workers for 5 working days (advancing \$4 per day). In this way, the capitalist transforms most of his capital-value from the money form into productive form. But now, after this transformation has taken place, the price of the iron has increased from \$2 to \$3 and consequently the productive stock of iron is revaluated from \$160 to \$240 - there is gain of capital equal to \$80, i.e., $\Delta C = \$80$. "As

retrospective expression of more labour-time, this [iron] adds a higher value to the product which it goes into as a component than it possessed originally and the capitalist paid for it" (Marx, 1981b, p. 207). Therefore, during the production process the workers now transfer the value equal to \$240 to the commodity capital produced and the total value of the commodities produced (240g) becomes \$320. The individual value of 1 kg of gold rises, between the first and the second periods of reproduction, from \$1 to \$1.33 (we are assuming that commodities continue to be sold according to their values and that the capitalist sells the whole amount of commodities produced). The capitalist thus transforms his commodity capital (240g whose value is equal to \$320) into money capital (\$320). For this second period of reproduction the rate of surplus value continues to be equal to 300%, but the profit rate declines to 23.08% ($r = \$60/(\$240c + \$20v) = 23.08\%$). The revaluation of the MP is accompanied by a reduction in the profit rate⁶. The second period of reproduction may be represented as follows:

$$M(\$180) - C \left\{ \begin{array}{l} MP=80i\$2=\$160 \\ LP=2w\cdot5c\cdot\$4\cdot5wd=\$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+80h \rightarrow 240g \\ (\$160c + \$80\Delta c) + \$80(v+s) = \$320 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$240c + \$80(v+s) = \$320 \end{array} \right\} - M'(\$320)$$

It is important to point out that the capital gain obtained by the capitalist will have to be tied up to the circuit of industrial capital at the third period of reproduction (assuming, of course, that the price of iron will remain constant from now on), in order for the scale of production to remain constant. At the 10th day the capitalist sells the commodity capital and receives \$320. Next day, 11th day, he returns to the markets to buy the elements of the labor process (MP and LP). Of the \$320 received, \$20 is advanced to hire 2 workers for 5 consecutive working-days and for buying 80 ton of iron he will need \$240 ($C = 80i \times \$3 = \240). Therefore, the capital gain he has obtained because of the revaluation of the productive stock of iron, as the reproduction process continues, must be tied up to the circuit in order to keep the scale of production constant. The capitalist realizes also the surplus value of \$60 which he uses as revenue. The circuit of industrial capital for the third period of reproduction is as follows:

$$M(\$260) - C \left\{ \begin{array}{l} MP=80i\$3=\$240 \\ LP=2w\cdot5c\cdot\$4\cdot5wd=\$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+80h \rightarrow 240g \\ \$240c + \$80(v+s) = \$320 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$240c + \$80(v+s) = \$320 \end{array} \right\} - M'(\$320)$$

From now on, if everything else remains constant, the above circuit will be the representation of this industrial capital process of reproduction.

⁶ As Marx points out, "[t]he effect of a rise or fall in capital value depends here [i.e., for the already functioning capital] very largely on the respective proportions of these components [i.e., money capital, productive capital and commodity capital]. (Marx, vol. 3, p. 207).

HYPOTHESIS 2: the price of the LP is fully and ex-posted indexed to the price of corn (i.e., real wage is constant) and the price of corn increases after the capitalist has purchased LP for 5 days.

$$M(\$180) - C \left\{ \begin{array}{l} MP=80i\$2=\$160 \\ LP=2w\cdot5c\cdot\$4\cdot5wd=\$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+80h\rightarrow240g \\ \$160c+(\$25v+\$55s)=\$240 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$160c+\$80(v+s)=\$240 \end{array} \right\} - M'(\$240)$$

According to our hypotheses, the consequence of the rise in the price of corn is that now the capitalist will have to advance \$5 per day to pay for the wages of workers, instead of \$4 he advanced previously. Thus, the revaluation of variable capital imply that the capitalist will have to tie up an additional capital equal to \$25 in order to continue to operate at the same scale of production.

The revaluation of variable capital results in a decrease of the rate of surplus value from 300% to 220% and the profit rate also declines. During the first turnover period the profit rate was equal to 33.33%, but now, in the second period of reproduction, it is equal to 29.73%. The price of gold continues to be same as before, namely \$1. The release or tying up of variable capital does not change the individual value of the commodity capital.

HYPOTHESIS 3: the price of the LP remains constant (i.e., nominal wage is constant) whereas the price of corn increases after the capitalist has purchased LP for 5 days

In this case, there is no change in the circuit of capital: the profit rate, the rate of surplus value and the amount of capital advanced remain unaltered, even though the price of corn has risen. The consequence of price changes will be only on the workers' circuit of revenue. Receiving the same nominal wages whereas the price of corn increases, the workers' real wage will decline.

HYPOTHESIS 4: price of iron changes before the capitalist purchases it

Let us now examine the effects of the increase in the price of iron (from \$2 to \$3) if it takes place before the capitalist purchases the MP. That is to say, the capitalist sells his commodity capital (240g) at the 5th by \$240 and next day he goes to the market to buy 80 ton of iron and to hires 2 workers for the next 5 working-days. Nevertheless, at the beginning of the 6th day the price of 1 ton of iron rises to \$3. Therefore, in order to keep constant the scale of production, he now needs to advance \$240 as constant capital (instead of 160). In other words, this capitalist needs to tie up an additional capital equal to \$80.

Let us recall that the circuit of the industrial capital for the first period of reproduction was as follows:

$$M(\$180) - C \left\{ \begin{array}{l} MP= 80i:\$2= \$160 \\ LP= 2w\cdot 5c\cdot \$4\cdot 5wd= \$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+ 80h \rightarrow 240g \\ \$160c+ \$80(v+s)= \$240 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$160c+ \$80(v+s)= \$240 \end{array} \right\} - D'(\$240)$$

At the 6th day, according to our hypothesis, the capitalist returns to the markets to hire 2 workers for the next 5 working-days, thus advancing \$20 of his capital-value, and to purchase 80 ton of iron. But now the price of iron is \$3, so that now he needs an additional capital of \$80 (assuming, of course, that the scale of production remains constant) in order to purchase 80 ton of iron; otherwise he needs to reduce the scale of production. If the capitalist is able to access this amount of additional capital, the circuit for the second period of reproduction will be as follows:

$$M(\$260) - C \left\{ \begin{array}{l} MP= 80i:\$3= \$240 \\ LP= 2w\cdot 5c\cdot \$4\cdot 5wd= \$20 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+ 80h \rightarrow 240g \\ \$240c+ \$80(v+s)= \$320 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$240c+ \$80(v+s)= \$320 \end{array} \right\} - D'(\$320)$$

The rate of surplus value continue to be 300% as before, and the rate of profit declines to 23.08%. Now, however, the capital advanced has increased by \$80 (from \$180 to \$260); that is, an additional capital of \$80 has being tied-up to the circuit in order to maintain the scale of production constant.

HYPOTHESIS 5: price of LP changes before the capitalist purchases it

This case is similar to that examined in hypothesis 2 above. Assuming that the value of LP rises from \$2 to \$2.5, the capitalist will have to tie up an additional total variable capital equal to \$25 in order to continue the reproduction on the same scale. The circuit for the second turnover period will be as follows:

$$M(\$205) - C \left\{ \begin{array}{l} MP= 80i:\$2= \$160 \\ LP= 2w\cdot 5c\cdot \$5\cdot 5wd= \$25 \end{array} \right\} \dots P \left\{ \begin{array}{l} 80i+ 80h \rightarrow 240g \\ \$160c+ (\$25v+ \$55s)= \$240 \end{array} \right\} \dots C' \left\{ \begin{array}{l} 240g= \\ \$160c+ \$80(v+s)= \$240 \end{array} \right\} - M'(\$240)$$

The consequence of the tying up of variable capital is that the rate of surplus value declines from 300% to 220%, and the profit rate from 33.33% to 26.83%. The price of gold continues to be same as before, namely \$1. Moreover, as we already seen, the release or tying up of variable capital does not change the individual value of the commodity capital, in this example the price of 1 kg of gold is equal to \$1 both at the first and second turnover times.

4 - Note on Devaluation of Fixed Capital and Moral Depreciation

First of all, it is important to point that, in principle, depreciation of fixed capital does not affect the profit rate since it does not change the total capital advanced. For example, let us assume that a capitalist advanced \$100 in order to buy a machine which lasts, on the

average, 10 years. So the annual depreciation charges is \$10. At the end of the first year, the fixed capital within the production process is \$90 and \$10 has been transferred (initially) to the commodity capital and (later on) it has been transformed into money capital and it is now incorporated into the depreciation fund. But the total value of the fixed capital advanced remains \$100: the value of \$90 is "fixed" into the productive capital and \$10 as part of the money capital (depreciation fund)⁷. There is no reason why profit rate should be measured only in terms of productive capital, it must be calculated in relation to total capital advanced. If this is done, then the introduction of fixed capital, and its depreciation, does not change, by itself, the profit rate of a given capital.

However, if there occurs a devaluation of fixed capital, either as a consequence market conditions or because of moral depreciation, then the profit rate will be affected.

Market conditions, specially during a crisis, may result in a decline of the prices of the elements of fixed capital (e.g., machines, buildings, etc.). If this happens, the value of these elements which are already present in the circuit of operating industrial capitals will be also devaluated: hence there will be a loss of capital. But, on the other hand, the profit rate will increase accordingly. It should be remembered that the devaluation of fixed capital may be taken into account, by the capitalist, only when the time for its replacement arrives.

When the devaluation of fixed capital is related with technological progress in the industry which produces these instruments of labor Marx calls it moral depreciation. On the one hand, the development of fixed capital "leads to changes in the means of production; they have to be replaced, because of their moral depreciation, long before they are physically exhausted" (Marx, 1981a, p. 264). This type of moral depreciation tends to be compensated by the capitalist by accelerating the depreciation of fixed capital (which usually imply in the extension of the working day). By doing this, the capitalist increases however the individual value of his commodity capital.

⁷ "Through its circulation, the product is transformed from a commodity into money, and so is the portion of the value of the means of labour that is circulated by the product; its value trickles from the circulation process as money in the same proportion that this means of labour ceases to be a bearer of value in the production process. Its value thus acquire a dual existence. A part of it remains tied to its use form or natural form, which pertains to the production process, while another part separates off from this form as money. In the course of its function, the part of the value of the means of labour that exists in the natural form steadily declines, while the part of its value converted into the money form steadily increases, until the means of labour eventually expires and its entire value has separated off from its dead body and been transformed into money." (Marx , 1981a, pp. 242-43).

Moral depreciation also result from the fact that the new elements of the fixed capital, due to increase in the productive of labor, are cheaper than the old ones⁸. In this way, the already functioning fixed capital are devaluated. Thus, a portion of the capital originally advanced will be lost. However, this loss of capital loss may be compensate at the time of replacement because the new fixed capital will be purchased at a lower price.

5 - Conclusions

In this paper we have examined the effects of price changes upon the profit rate from the standpoint of Marx's concept of industrial capital. We have shown that the effects of price changes on the profit rate of a given industrial capital gives rise either to the phenomena of revaluation/devaluation of capital or to the phenomena of release/tying-up of capital - depending on the stage of the circuit when there occurs the price change. Moreover, these prices change also affect the profit rate and, in some cases, the individual price of the commodity capital.

The main conclusion of this analysis is to indicate that, from the standpoint of TSS interpretation of Marx's theory, the concept of the circuit of industrial capital is central to the analysis of the effects of prices change on the profit rate. It is also interesting to note that prices change may affect quite differently individual capitals, depending on the proportion of the capital-value in each phase of their circuit.

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⁸ "After ten years have elapsed, it is generally possible to buy the same quantity of carriages and locomotives for \$30.000 as previously cost \$40.000" (Marx, 1981a, p.250).