

The Analysis of Marx's Composition of Capital. The Unsettled Controversies

by
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Introduction

Marx's categories¹ of the composition of capital constitute fundamental keys to his economic theory. They play a crucial role in his theory of the tendency of the falling rate of profit and in his transformation of values into prices. The long-lasting discussion, concerning the meaning of these categories, indicates that their definitions were not clearly enough expressed. Therefore, they left space for various interpretations. The recently published interpretation of Alfredo Saad-Filho (1993 and 1997) raises some basic questions concerning the interpretation of Marx's concepts, and we will discuss it in what follows.

Attempts to solve this unsolved problem must be based on two sources: 1) the definition of the composition of capital as given in C/I, and 2) Marx's original manuscript of C/III, as published in MEGA. Since C/I was written after the manuscripts of C/II and C/III, the definition given there is the decisive one. This is especially true of the French edition, the latest version of C/I edited by Marx himself. This definition was afterwards introduced by Engels into the third German edition of C/I in 1884.

Comparing Marx's manuscripts of C/III with the only known (until recently) text edited by Engels (1895), reveals important differences concerning the composition of capital. Engels both omitted and added important words and passages to Marx's original text.

Marx's definition of TCC and OCC

Marx presents the structure of capital in terms of three kinds of its compositions: the technical composition (TCC) and two types of value

1. Capital Vol. I, II, III hereafter C/I, C/II, C/III; Theories of Surplus Value Vol. I, II, III as TH/I, TH/II, Th/III; selected correspondence as M.E.S.C.

composition: the organic composition of capital; and the value composition of capital (OCC and VCC). Each expresses the input-cost relations, according to their function in the economic process. TCC expresses, in physical term, the input-cost relations between the means of production and living labor, as required by the *labor process*.² OCC and VCC represent, in monetary form, the evaluation of the input-cost relation,³ as required by the socio-economic production relations of the capitalistic system.

Using Marx's verbal definition in C/I, p. 762,⁴ and his notations in C/II,⁵ TCC is determined by the relation between:

$$\frac{\text{The mass of employed means of production}}{\text{The mass of employed living labour}} = \frac{q_{(mp)}}{q_{(lp)}}$$

where (mp) stands for '*means of production*' and (lp) for '*labor power*' as a term, therefore we put it in brackets. q stands for the relevant quantity. In this form, TCC is a heterogeneous use-value relation. Its techno-productive meaning in the permanent labor process is the level of mechanisation by which human society creates its material existence: "Whatever the social form of production, workers and means of production always remain its factors" (C/II, p. 120). As

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2. C/I, p. 290: "The labour process... is the universal, condition for the metabolic interaction between and nature, the everlasting nature-imposed condition of human existence, and is therefore independent of every form of that existence, or rather it is common to all forms of society in which human being live".
 3. Groll, Shalom and Ze'ev Orzech (1987), Technical progress and values in Marx's Theory of the decline in the rate of profit: an exegetical approach, *History of Political Economy* 19(4), pp. 591-613.
 4. "The composition of capital is to be understood in a twofold sense. As value, it is determined by the proportion in which it is divided into constant capital, or the value of the means of production, and variable capital, or the value of labour-power, the sum total of wages. As material, as it functions in the process of production, all capital is divided into means of production and living labour-power. The 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. I call the former the value-composition, the latter the technical composition of capital. There is a close correlation between the two. To express this, I call the value-composition of capital, insofar as it is determined by its technical composition and mirrors the changes in the latter, the organic composition of capital. Wherever I refer to the composition of capital, without further qualification, its organic composition is always understood" (C/I, p. 762).
 5. C/II, p. 114.

with everything in capitalism, so also TCC needs to be expressed in value to become an economically measured term. The value assessment does not negate the significance of TCC as the labor process component. However it must reproduce in value terms the content of the material relation defined verbally. Therefore, TCC in value terms equals:

$$\begin{aligned} \frac{\lambda_{(mp)}}{\lambda_{(lp)}} \cdot \frac{q_{(mp)}}{q_{(lp)}} &= \frac{\lambda_{(mp)}}{(\lambda_n + \lambda_s)} \cdot \frac{q_{(mp)}}{q_{(lp)}} = \\ &= \frac{\text{constant capital}}{\text{variable capital} + \text{surplus value}} = \frac{C}{(V + S)} \end{aligned}$$

where:

λ = the general expression of value⁶

n and s = the necessary labor and surplus labor respectively

q = the quantity of the relevant factor

Marx himself did not provide the definition of the value assessment of TCC. We can only speculate about the reasons for that. One of them could be his essential distinction between the labor, valorization, and production process.⁷ The labor process constitutes the necessary and everlasting, “nature imposed,” condition of human existence. This process is independent of every social form of that existence, or rather, “it is common to all forms of society” (C/I, p. 290). In the labor process, all the means of production and the living human labor required participate in the production of use-value. However, the labor process has always a social character. Marx defined the specific social way by which the combination of (mp) and (lp) is implemented, as the valorization process. While the labor process, and therefore TCC, is common to all forms of society, the valorization process is what distinguishes the various social systems from one another⁸. The capitalistic production process has to be considered as the specific unity of the labor and valorization processes, where the latter

6. The components of means of production, mp, are of heterogeneous kind and practically constitute a vector. For their numerical valuation they should be multiplied by the vector of the relevant units of value, or money, $\lambda_{(1,2, \dots, n)} \cdot mp_{(1,2, \dots, n)}$. Here, however, we are not interested in the numerical valuation of each of the components or their sum, but rather we devoted λ to symbolize the ‘value expression’ in general. This permits to use λ as a general, encompassing expression of value, instead $\lambda_{(1,2, \dots, n)} \cdot mp_{(1,2, \dots, n)}$.

7. C/I, pp. 283-300.

8. C/II, p. 120.

shapes the activity of the former, TCC included⁹. In the material form $\frac{(mp)}{(lp)} = TCC$ expresses the division prevailing in the labor process between

the accumulated stock of the (mp) and the implemented human labor. This division is determined by the given techno-productive capacity to produce the output. In value form, the valued components of the labor process value of the means of production form the *social cost ratio* of all the value product

employed inputs, the entire, *social* cost of producing the output. In value form, TCC expresses neither the *capitalistic* costs nor their ratio. On the contrary, the value expression of TCC reveals the universal *costs* of production, $C+(V+S)$, or in the ratio form, $\frac{C}{(V+S)}$, as against the *capitalistic* costs of production

$(C+V)$ or their *capitalistic* ratio of the factors, $\frac{C}{V}$, “What the commodity costs the capitalist, and what it actually does cost to produce it, are two completely different quantities.” (C/III, p. 118)¹⁰.

The capitalistic outlays on production include the purchase of (mp) and the amount expended to *hire* (lp). This amount is smaller than the amount contributed by (lp). Because of this difference, Marx focused on the capitalistic valorization process, as the factor which imposes the capitalistic form $(C+V)$ and its ratio $\frac{C}{V}$ on the labor process, namely, on $\frac{(mp)}{(lp)}$ (C/II, pp. 110/11).

We presume that Marx preferred to adjust the definition of the compositions of capital in C/I (p. 762) to the content of the labor and valorization processes, as defined in C/I, chap. 7. He chose the material form of TCC, as consistent with the universal essence of the labor process, rather than

9. C/II, p. 120.

10. “...what the production of the commodity *costs* the capitalist and what the *production of the commodity itself costs*, are two entirely different things...The living labour expended upon the commodity and the living labour paid by the capitalist are two different things” (Th/III, pp. 88, 81).

“The capitalist cost of the commodity is measured by the expenditure of *capital*, whereas the actual cost of the commodity is measured by the expenditure of *labour*” (C/III, p. 118; see also, p. 133 and C/I pp. 300/1).

giving it the specific form of the capitalistic system. The mixing up of “the definite, specific form in which these things constitute capital with their nature as things and as simple elements of every labour process” (Th/III p. 265), could create the appearance of the capitalistic system as an eternal one.

The value expression of the labor process components and their ratio, TCC, expresses the social cost of production of the commodity, its elementary ratio and does not represent the actual capitalistic cost and the ratio of the productive capital in capitalistic terms.

Does TCC in value terms equal OCC?

To define TCC in value terms does not cause a particular difficulty, if one employs Marx's categories according to his verbal description. As far as it is known, there have been few, if any, attempts to derive a value definition of TCC. The one original, recently published, attempt is that of Alfredo Saad-Filho. For him, OCC represents TCC in value terms. OCC is (1) the “immediate value-reflex of the TCC”; (2) a “technological composition that synthesises, in value terms, the technical relations”; and (3) it “...relates the *total* value of the constant capital... to the *total* labour time (whether paid or unpaid)” (his 1993, p. 131; see also his 1997, pp. 118/19)¹¹.

These views are not compatible with Marx. For him, OCC is a value composition “determined by the proportion in which it is divided into constant capital or the value of the means of production, and the variable capital, or the *value of the labour power*, the sum of *total wages* [and] is *determined* by its technical composition and *mirrors* the changes in the latter.” (C/I, p. 762; emphasis added). The difference is clear-cut. For Marx $OCC = \frac{C}{V}$ is the value

ratio of *capitalistic* costs, for A.S-F, $OCC = \frac{C}{V + S}$ is the value expression of

the material components of labor process, TCC. Actually the latter represents the ratio of social costs of the production of a commodity¹².

11. Th/III p. 382; also A.S-F in his second paper:

“...the OCC is the ratio between the value of the (fixed and circulating) constant capital and the (paid and unpaid) labour time socially necessary to transform the inputs into outputs”, pp. 118/19.

12. A.S.-F opens here a new field of discussion about Marx's variables and terminology. Until now the disagreement turned around the interpretation of OCC and VCC. However, there

Marx's ultimate definition of OCC, given by him in the French edition of the first volume of *Capital* (1875) was preceded by his earlier attempts to define the term. In Th/II, pp. 275/89, 321, 328, 435/52 pp., Marx provides many examples of OCC as $\frac{C}{V}$, and as indicated in the subtitle of the sections, he

refers them explicitly to OCC. In his letter to Engels (2 August 1862), dealing with the different rates of profit, he wrote: "This will depend on the organic composition of capital, i.e., on its division into constant and variable capital".¹³ In the manuscript of C/III, in a passage omitted by Engels, Marx defined: "...we will always understand the organic composition of capital as a relationship of how much of the total capital invested in different production spheres is divided in percentage terms into constant and variable capital" (MEGA II/4.2, p. 421 our translation). Again, in his C/I p. 762 definition, Marx pointed out explicitly that when the linkage between the technical and value composition is analysed, it is OCC, as the ratio $\frac{C}{V}$ (the variable capital as the sum of wages only) that is considered.

What, therefore, is the element missing from OCC, in every valuation of *capitalistic costs*, and present in the value composition of TCC in capitalism? It is the unpaid living-labor, the difference between the social and the capitalistic costs. OCC is the value ratio expression of the capitalistic cost relations,¹⁴ and these are not TCC.

The Formation of OCC

Marx's conception of $OCC = \frac{C}{V}$ refers to the following points:

always existed a general agreement about the definitions of OCC and VCC as $\frac{C}{V}$. The OCC configurations as $C/(C+V)$, $(C+V)/V$, $V/(C+V)$ as they appear sometime in the literature, are used to simplify the algebraic calculations, without blurring the essence of the expression $\frac{C}{V}$. None of them defined OCC as expression $\frac{C}{V+S}$ or the value term of TCC, because it changes the meaning of the term (Ben Fine: (4) 59; (1) 118; (3) 61; (2) 118; (5) 1512 respectively).

13. M.E.S.C. pp. 129/30.

14. C/III, p. 254.

1) Since $\frac{(mp)}{(lp)}$ in the labor-process is common to all social systems, it always serves as the foundation on which the relevant production activity rests¹⁵.

2) $OCC = \frac{C}{V}$ expresses the impact of the capitalistic valorization process on $\frac{(mp)}{(lp)}$ of the labor process. OCC is unaffected by to the absolute magnitudes of its components, despite their importance in the determination of the level of economic development.

3) Only non-proportional changes of the components $\frac{\lambda m}{\lambda n}$ or $\frac{(mp)}{(lp)}$ alter OCC. These changes occur in two forms: either as improvements in employment of the factors of production in the *given* production process $\frac{(mp)}{(lp)}$ without a change in their unit value, or as a new mode of production, which is expressed by a *change* in $\frac{(mp)}{(lp)}$. Improvements in employment in a given production process may result from increased intensity of work, better organization of production, improvement in the experience of workers, externalities, concentration and centralization. When these improvements occur in the industry under consideration, they are considered an *output effect*. A change in the unit value of factors, in the industries which supply the inputs (mp and wage commodities) may be considered an *input effect*. Actually both effects constitute a technological change of the structure of production in the industry under consideration.

15. "There is a definite technical proportion between the amount of labour and the mass of means of production to which this living labour is to be added, a proportion that depends on the particular character of the labour. Their value is completely immaterial here; what matters is the amount technically needed. It is quite unimportant whether the raw material or means of labour are cheap or dear, as long as they possess the use-value required and are present in the technically prescribed proportions for the labour they are to absorb." (C/III, p. 137).

4) Certain production processes may involve the same proportion of $\frac{(mp)}{(lp)}$

but their components are more or less expensive, i.e. $\frac{\lambda_{ml}}{\lambda_{mp}}$ is different (C/III, pp. 244, 900). Such cases cause a different OCC.

5) The variable capital, $\lambda_n(lp)$ –given the length of the working day and the rate of surplus value– serves as an index of *employment* (C/III 245/6), because it indicates the number of (lp) that can be hired at prevailing wage.¹⁶

Alfredo Saad-Filho's view

Alfredo Saad-Filho bases his view on several quotes from Marx. The two most important are, one from C/III, p. 244 and another, written before (1862/3), from Th/III, p. 382. As for the first quote, it is important to note that in his editorial work on C/III, Engels omitted from the original manuscript the term “organic” twice, and twice replaced the term “value relations” by “value composition” – a term that Alfredo Saad-Filho interprets as VCC. The original quote argues¹⁷ that OCC is to be understood as “the ratio... between *constant*

16. “There is therefore a very fundamental distinction to be made between the variable capital laid out on wages to the extent that its value, the sum of wages paid, represents a definite quantity of objectified labour, and the variable capital to the extent that its value is simply an index of the mass of living labour that it sets in motion. This last is always greater than the labour contained in the variable capital and is thus also expressed in a higher value than that of the variable capital” (C/III, p. 246).

17. We reproduce Marx's original text and mark the omitted or added terms:
 a) “By the *organic composition* (Engels omitted ‘organic’) of capital we mean the ratio between its passive and its active component, between *constant* and *variable* capital. In this organic composition (Engels omitted ‘organic composition’). Two relationships are involved... The first relationship rests of technological basis... A definite *number of workers* corresponds to a *definite quantity of means of production*... This relationship constitutes the actual basis of organic composition of capital (Engels added a part of sentence) ... But because copper is dearer than iron, the *value relationship* between variable and constant capital will be different in each case... and so therefore the *difference in their composition* (Engels added ‘value’) as a whole. The distinction between the *technological composition* and the value relationship (Engels replaced ‘relationship’ by ‘composition’) shows itself in every branch of industry by the way the *value relationship* between the two portions of capital may change while the *technological composition* remains *constant*, whereas with a *changed technical composition*, the *value relationship* may remain the same...”, (MEGA II/4.2, pp.

and *variable* capital,” and that “two relationships are involved” in OCC. The first relation, $\frac{(mp)}{(lp)}$, “rests on a technological foundation” (Grundlage), and “constitutes the actual foundation of the organic composition of capital.” The second relation, $\frac{\lambda_{mp}}{\lambda_n}$, involved in the determination of OCC, expresses the change in the value relations. This ratio may be different, as the values of the components are more or less expensive. Therefore, despite the fact that “certain operations” require the same $\frac{(mp)}{(lp)}$ “the *value relationship* between variable capital and constant capital will be different in each case”. In the case where $\frac{\lambda_{mp}}{\lambda_n}$ underwent a change, while $\frac{(mp)}{(lp)}$ remained constant, a different $OCC = \frac{C}{V}$ emerges. The distinction between the “technological composition” and the “value relation” reveals itself by the possibility that “with a *constant technological composition* the *value relationship* can change and with a changed *technological composition* the *value relationship* can remain unchanged”. It is crucial to be aware of this distinction. Marx explicitly distinguishes between the term “value relationship” (*Werthverhältniss*), and the term “value composition”, (*Werthzusammensetzung*). These terms are not identical. Every composition of capital, OCC or VCC, expresses some “value relationship”. However, a “value

217/218) (the emphasis in origin). See also: “...as the *organic composition* of capital we always mean the percentage division into constant and variable capital of the entire capital invested in various production spheres” (ibid. p. 221).

b) “The ratio between the different elements of productive capital is determined in two ways: *First*: By the organic composition of productive capital. By this we mean the technological composition. With a *given productivity* of labour, which can be taken as constant so long as no change occurs, the amount of raw material and means of labour, that is, the amount of constant capital –in terms of its *material elements*– which corresponds to a definite *quantity of living labour* (paid or unpaid), that is, to the *material elements* of *variable* capital, is determined in every sphere of production”. (Th/III, p. 382).

Secondly: however, if one assumes that the organic composition of capitals is given ... then the *value ratio* can change although the technological composition remains the same. What can happen is: a) a change in the value of constant capital; b) a change in the value of the variable capital; c) a *change in both*, in equal or unequal proportions” (Th/III, p. 383).

relationship” does not necessarily mean that the ratio expresses the “value composition of capital”, VCC. In this quote Marx does not use the term “value composition” at all, and certainly not as VCC. Alfredo Saad-Filho identifies every “value relationship”, as “value composition of capital”, VCC. In our view the quote indicates that $\frac{(mp)}{(lp)} = TCC$ in the material terms, and $\frac{\lambda_{mp}}{\lambda_n}$ is the value relationship in the production sphere. Only when these two relations are combined *as a whole* does the outcome represents $\frac{\lambda_m}{\lambda_n} \cdot \frac{q_{(mp)}}{q_{(lp)}} = \frac{C}{V} = OCC$.

The second quote belongs to the chapter devoted to Cherbuliez. Marx discusses there Cherbuliez’s theory of the rate of profit as well as the latter’s vague ideas of OCC, (Th/II p. 370). Already at the beginning of the chapter, Marx criticizes Cherbuliez for reducing *capital* “to the material elements in which it presents itself in the labour process... Thus the objective factors of the labour process –which are common to all forms of production– are here called *capital*, although the *means of subsistence* (in which wages are already included) tacitly implies the *capitalist* form of these conditions of production” (Th/III, p. 362).

The crucial problem concerns the interpretation of Alfredo Saad-Filho of the following passage by Marx: “The ratio between the different elements of productive capital is determined in two ways: First: by the organic composition of productive capital. By this we mean the technological composition”. Alfredo Saad-Filho considers this as a proof that OCC is the value expression of TCC. In our view, these sentences and the preceding paragraphs must be interpreted so as to be consistent with Marx’s critique at the beginning of the chapter of Cherbuliez’s conception of productive capital. There Marx rejects the interpretation of *capital* as including the material elements of the labor process by stating that in the capitalistic system the means of subsistence refer to wages, not to the entire labor employed.

Following Cherbuliez, Marx asks how, in a particular industry, the given TCC of the material components of the labor process –(mp) and (lp)– become the productive capital C+V, and how their ratio is formed. Marx points out that the ratio between the components of *productive capital* is determined in two ways (as before by two relations):

- 1) assuming as given the mode of production, (pp. 382/3); or
- 2) assuming a change in the mode of production, (pp. 383/5).

1) In a given mode of production, the output is a function of the amount of mp and the entire lp (paid and unpaid) needed to set mp into motion. The material components of the labor process form the means from which the productive capital is derived. Marx, therefore, must begin with the material elements of the labor process and TCC, because they express the productive conditions. Since the analysis deals with the productive capital, it must start with the material (mp) and the entire (lp). But “with a *given productivity* of labour... [and] rate of exploitation” (ibid. p. 383), the capitalistic valorization process transforms the material components into the capitalistic production process and its cost ratio, $OCC = \frac{C}{V}$. The material (mp), the entire (lp), and

TCC become productive capital C+V and its ratio $OCC = \frac{C}{V}$. This is the

meaning of the sentence: “By this we mean the technical composition”. Marx leaves no doubt that he refers to OCC as $\frac{C}{V}$: “The constant capital –in terms

of its material elements– corresponds to a definite quantity of living labour (paid and unpaid), *that is, to the material elements of variable capital*” (ibid, p. 382) (emphasis added). It is not accidental that Marx uses the material elements of the labor process in connection with the concepts of the constant and variable capital. In the productive capital, the employed living labor, paid and unpaid, is expressed only by the paid part, the variable capital (index effect). The variable capital hires the entire labor but pays only $\lambda_n(lp) < (\lambda_n + \lambda_s)(lp)$.

2) The second way indicates that, in the assumed OCC, “the *value ratio* $\left[\frac{\lambda_{mp1}}{\lambda_n} \right]$ can change although the technological composition $\left[\frac{(mp_0)}{(lp_0)} \right]$ remains the same” (ibid, p. 383). These changes are the outcome of technological changes in OCC in the branches which supply the inputs for the industry under consideration. They refer to changes in constant, variable or both kinds of capital (ibid. p. 383).

In the Th/II, p. 276, Marx returns again to the problem. Alfredo Saad-Filho quotes only a part of the relevant paragraph (in 1993, note 5, p. 141). Marx assumes there “that no change has taken place in the organic composition of capital... in the manner of production”, i.e. the index effect.

Therefore the same number of workers is required to operate the same amount of (mp). We have seen this case in the previous quotes. Marx added: “Besides this first aspect of the organic composition of capital, however, a second aspect has to be considered, namely, the change in the *value* of the elements of capital although as use-values they may be employed in the same portions”. As before, “two relations”, “two ways”, and now “two aspects”(!) in OCC.

In TH/II pp. 380/4, Marx returns again to the differences in OCC: (p. 380): “A. *A change in the method of production* brings about a change in the *proportion* between the amounts of constant and variable capital employed; ... B. *The method of production remains the same. There is a change in the ratio of constant to variable capital...caused by a change in the value...[of] constant or variable capital.* C. Change in both the method of production and the change in the value of the elements that form constant or variable capital”. To his previous uses of: “two relations”, “two ways”, and “two aspects” he now adds “two differences” to the way he discusses the two components of OCC.

OCC and VCC

The VCC is beyond the scope of this paper. However it is not beside the point to indicate the difference between OCC and VCC. Both OCC and VCC are value relations. The difference between them is a function of location, and the of forces acting on them. Changes in value ratios in the *production sphere*, caused by the techno-productive factors, are of OCC nature, while those in the *circulation sphere*, caused by market factors, are of VCC nature.

OCC was defined as value composition of cost relation determined by the technical composition. Beside the technical factor there are other additional factors, the market forces, that cause changes in the value of cost-relation. The market forces cause the interplay between the market-value and market-price and determine the value composition of cost relation, VCC. The technical factors and the market-forces are not identical. Their impacts on the components of the cost-relation may operate in the same, as well as in opposite direction. Therefore, it is important to distinguish between them.

OCC is the production phenomenon, because only in the production sphere the technological factors are acting. VCC is the market phenomenon, because only in the circulation sphere are the market-forces imposing their impact on the market-value and the market-price.

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