Why Fixed Capital Cannot Transfer its Value to the Product

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Abstract
Almost all of the various economic theories consider that fixed capital, although it is defined as a final good, transfers its value to the product. This short note will show that this amounts to considering fixed capital also as an intermediate good. Going back first to the specific characteristics of intermediate goods and final goods, we will show that it is not logically possible to consider fixed capital both as a final good and an intermediate good, because this erroneous starting point leads to insurmountable contradictions. The postulate that fixed capital transfers its value to the product must therefore be abandoned.

Keywords Fixed capital, intermediate goods, final goods, transfer of value

Almost the whole economic theory is based on the explicit or implicit assumption that fixed capital used in the production process transfers its value - most often called amortization of fixed capital, to the product. This is true for classical economists - including Marx, neo-classical economists, and neo-Ricardian economists, i.e. Sraffa and his followers.

This is true also regardless of how this value is defined: as labour value, for classical economists, as equilibrium prices, for neo-classical economists, or as production prices, for Sraffa and his disciples.

One rare exception is Keynes, who in chapter 3 of the General Theory defines the user cost as the cost that the entrepreneur incurs by employing the equipment instead of leaving it idle. Indeed in this chapter Keynes indicates on footnote 2 (Keynes, 1936, P. 24) that he excludes the user cost both from the proceeds and from the aggregate supply price of a given volume of output. He comes back to this question in the appendix on user cost of chapter 6 (Keynes, 1936, p. 66). But his demonstration is quite obscure and has been totally ignored. However the line of reasoning that will be used in this short note has little to do with Keynes' reasoning.

It will be shown here that an assumption such as the transfer of value of fixed capital has no logical basis and must be definitively abandoned by economic theory. Since the nature of the goods which appear in the production process is intimately connected to the question of the transfer of value of fixed capital, we will start by shedding some light on this conceptual problem, pointing out first to the specificity of intermediate goods (section 1), as opposed to final goods (section 2). We will then show how both types of goods theoretically relate to the question of this transfer (section 3). The method of '*reductio ad absurdum'* will be used to demonstrate in two different ways that fixed capital cannot logically transfer its value to the product (section 4). This will allow us to conclude (section 5).

1. Intermediate goods.

Intermediate goods are goods which disappear in the production process under their initial shape or form, because they are transformed during this process, either into other intermediate goods or into final goods.

Intermediate goods usually include raw materials and goods resulting from the transformation and successive processing of these raw materials, up to the stage where this transformation ends up into the appearance of final goods at the end of this process.

However this transformation does not imply the full disappearance of these intermediate goods, because their material substance or content at the most basic level does not disappear, but is incorporated or transmitted, under another shape or configuration, to other goods that appear downstream in this process, be they intermediate or final goods. In other words, intermediate goods reappear in a new form, with their constituents being incorporated within or inside the goods into which they have been transformed. They become a part of the substance or structure of these final goods.

This means that intermediate goods are not consumed in the production process, where they are transformed but do not completely disappear, even though economist sometimes use the expression of 'productive consumption', which is a kind of oxymoron, and national accountants speak of 'intermediate consumption', which can also be misleading, to describe this process.

Indeed consumption as such, or final consumption, to be more precise, means the immediate disappearance, for non-durable goods, or progressive disappearance, in the case of durable goods, of these last goods, be they consumption goods as such or fixed capital goods, which are both final goods. Even though durable goods may not physically disappear, they are no longer used or usable.

This implies that, as well as production is a process of creation of value, which transfers the value of intermediate goods to final goods into which they are incorporated, consumption is a destruction of value, either immediate or, in the case of durable goods, progressive over time. As such consumption cannot transfer any value, which would be a « contradictio in adjecto ». On the contrary consumption is equivalent to an immediate or progressive destruction of value.

2. Final goods

The transformation of intermediate goods into final goods takes place in successive stages, until the moment when it allows the obtaining of these final goods. These final goods do not enter or re-enter into the production process to be transformed again. They do not in any case disappear in the production process, but appear and come to existence at the end of this process. Therefore they are the final outcome of the production process, and their value constitutes the value of the product.

This transformation process which ends up in the creation of final goods is carried out by human labour helped by means of production, like tools or machines, which do not disappear and are not transformed during this process. These means of production stay the same and keep their initial form during this transformation of intermediate goods, which by itself constitutes the production process (although they can be affected by some wear).

This is the reason why these means of production, either tools or machines of various kinds, from the simplest ones to the most sophisticated ones, are usually named « fixed capital ». This is also the reason why these goods are considered as final goods, at the same time as consumption goods, which are the other type of final goods.

Consumption goods are sold on the market to workers (workers only a in the most simple model where there is no capitalist consumption) and to capitalists who use them to satisfy their human needs, from the most basic ones to the most sophisticated ones. Once they have been bought on the market, against money, their value has been realized, once and for all.

Goods constituting fixed capital are also sold on the market, but only and by definition to capitalists, either existing ones, already owning means of production, or future ones. These capitalists are going to use them in the production process, to combine them with human labour in order to increase the productivity of this labour. Once they have been bought on the market, against money, their value has also been realized, once and for all.

Thus for a given period of production, whatever it may be, the value of the product of the period is the sum of the value of consumption goods and fixed capital goods produced during this same period. Both of them constitute the final goods and final product of the corresponding production process.

The utilization of final goods, be they consumption goods or fixed capital goods, immediately (for single–use consumer goods) or ultimately (for durable goods) leads to their disappearance, even for durable goods once they are no longer usable. At the end of their useful life, they are disposed of, destroyed or recycled. In both cases their value can be considered to have been destroyed by either this consumption process - for consumption goods, or by their use in the production process – for fixed capital goods. Ultimately their value has thus completely disappeared.

The fact that they can be sold again on the market, as second hand goods, before their complete consumption or complete use as fixed capital in itself does not create any value. It only changes the property of their already existing value. Indeed value can be created only once by the production process itself, and no other process.

3. The transfer of value

Intermediate goods transfer their value to final goods, because they are themselves a constitutive and material component of these final goods, into which they are incorporated. Their value is thus transferred to the product made of these final goods. This means that their specific value cannot be registered separately as a part of the value of the final product, which would come down to counting their value twice.

Conversely, the value of final goods, once it has been accounted for as the value of the final product, cannot be registered a second time by considering these final goods simultaneously as intermediate goods which would transfer their value (or part of it) to the product, because this would also come down to unduly counting this value twice.

For the same reason, once final goods have been sold on the market at the end of the production process, their value cannot be realized and counted a second time (or more) if and when they are sold again on the market.

If such a second sale of these final goods happens, as indicated above, they are sold as used goods or second-hand goods, and their sale creates no new income at macroeconomic level. It only generates a change in the distribution of goods and money, because at macroeconomic level the income obtained by the seller of the good is offset by the income spent by the buyer, and the good has conversely gone from the seller's to the buyer's property.

4. Fixed capital cannot transfer its value: two proofs by contradiction

Most economic theoreticians, from classical economists, including Marx himself, to neo-classical economists, and even to neo-Ricardian economists (disciples of Sraffa), consider that during the whole period of their use as a means of production fixed capital goods progressively transfer their value to the product.

This amounts to considering that, although fixed capital goods are clearly final goods that do not disappear in the production process, they can nevertheless be considered at the same time as a particular kind of intermediate goods, which - as seen above - necessarily transfer their value to final goods in which they are incorporated).

If we accept such an assumption, which is rather a postulate (taken for granted), of the transfer of value from fixed capital to final goods, it is easy to show that strange things happen, which invalidates the possibility of such a transfer. This will be demonstrated below, through two types of reasoning, which are two examples of '*reductio ad absurdum'*.

4.1. If we suppose that fixed capital transfers its value to final goods, which constitute the final product, it is easy to show that this would create a first contradiction.

Indeed if we make the assumption that fixed capital transfers its value to the final product, then we must put fixed capital in the inputs of the production process, for the part of its value that is transferred., i.e. put it on the left side of the equations describing this process, like for intermediate goods - to which fixed capital is necessarily assimilated, as long as this property (transferring its value to the final product) is concerned.

However, in a self-replicating state where fixed capital stays the same and only replaces itself it is immediate that the value of fixed capital transferred is exactly the same as the value of the new fixed capital produced during this process, which appears on the right side of the same equations. In other words, the output and the input of fixed capital cancel each other in the production process, and there cannot be any net or additional production of fixed capital! This is similar to all of the other intermediate goods, which at global level appear both on the right hand-side (when they are produced) and simultaneously on the left-hand side (when they are used as inputs) of the equations describing the production process. However, at the end of the production process, and because all of the produced intermediate goods have been transformed in this process, they cannot therefore appear in the net product, where only final goods appear.

All this means that fixed capital, as long as it is considered as an intermediate good transferring its value to the product, should not be considered at the same time as a final good being part of the net product, and that under this assumption only consumption goods could be part of the product of the period.

But this is absurd, because at the completion of the production process fixed capital goods, like consumption goods, have not disappeared during it, but still exist as an output of this process. They have been created, as well as consumption goods and during the same period, through the use of human labour: as such fixed capital goods have necessarily a net value.

Indeed, at the difference of other true intermediate goods, fixed capital goods have not disappeared in the production process, but still exist under the same form at the end of it. This implies that their value does not disappear and still exists at the end of this process, and will be consumed over their lifespan, during which fixed capital is going to be used as a means of production in further periods and production processes. But this will correspond to a progressive destruction of their value, and not to a transfer of this value.

It is only during the processes during which they are used as means of production that their value will be progressively consumed and ultimately destroyed, along with the end of their use or their physical disappearance. Therefore this value cannot be cancelled at the same time as it is created, by its supposed or hypothetical transfer to the value of final goods, as if they were simultaneously intermediate goods appearing on the left side of the equations describing the production process.

This first example of contradiction clearly shows that the same goods constituting fixed capital cannot be considered as final goods and at the same time as intermediate goods.

4.2. Another way of approaching the question and highlighting a second contradiction deriving from the assumption of the transfer of value of fixed capital, in spite of the preceding demonstration, amounts to not taking its result into account, and to consider that fixed capital goods can nevertheless behave both as final goods and as intermediate goods.

We assume (or rather postulate) therefore that fixed capital actually has a dual nature, and is both a final good and an intermediate good, which as such transfers its value to the final product comprising both consumption goods and fixed capital goods.

Suppose therefore that in a given period the value of the fixed capital produced during this period is Vc, and that this fixed capital has an average lifespan of T periods, during which it will transfer this value to both consumption goods and fixed capital goods, corresponding to a transfer of $\frac{Vc}{T}$ for each period. Let us assume also that a fraction a of this value is used in and transferred to the fixed capital section, and a fraction $1-a$ is used in and transferred to the consumption goods section. It results from these assumptions that there are T periods during which fixed capital is going to transfer in each period a fraction $\frac{Vc}{T}$ of its overall value to the final product.

In a given period (let us number it period 0) the newly produced fixed capital, available at the end of the preceding period and thus at the beginning of this given period, therefore transfers its value as follows :

$a\frac{Vc}{T}$ to the value of fixed capital, and $(1-a)\frac{Vc}{T}$ to the value of consumption goods

In the next period of production (period 1) this value transferred to fixed capital, which is thus an integral part of this new fixed capital value, will be retransferred to fixed capital goods and consumption goods, in the same proportions :

$a\left(a\frac{Vc}{T}\right)$ to the value of fixed capital, and $(1-a)\left[a\left(\frac{Vc}{T}\right)\right]$ to the value of consumption goods

The same thing will happen in the next period, because there is no reason why these transfers of value would stop until the residue to be transferred is infinitely small, and there is close to nothing to be transferred again. Let us consider thus that these transfers of value will go on until period n, during which the value ultimately transferred by the original fixed capital (first used in period 0) will be:

$a^n\left(a\frac{Vc}{T}\right)$ to the value of fixed capital and $(1-a)\left[a^n\left(\frac{Vc}{n}\right)\right]$ to that of consumption goods

If we make the sum of all these quantities of value transferred to both sections over the course of n periods, we obtain :

$$\left(a\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right) + (1-a)\left(\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right) =$$

$$\left(a\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right) + \left(\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right) - a\left(\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right) =$$

$\left(\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right)$: Indeed the first and third members of the preceding expression cancel each other.

Since the value transferred will be the same in each period for all of the T periods of the lifespan of fixed capital, then at the end of this lifespan the T transfers of fixed capital will in the end add up to a total transferred value to the final product of :

$$T\left(\frac{Vc}{T}\right)\left(1+a+a^2+...+a^n\right)=Vc\left(1+a+a^2+...+a^n\right) = Vc+Vc\left(a+a^2+...+a^n\right)$$

Thus the total value transferred will be not only the initial value Vc of fixed capital, but on top of that, and with n tending to infinity, an additional value of :

$$Vc\left(a+a^2+...+a^n\right)=aVc\left(1+a+a^2+...+a^n\right)=Vc\frac{a}{1-a}.$$

For instance, for an initial value of fixed capital of 100, if the share of value of fixed capital going to section 1 were: $a=0.25$, then the total value transferred to final goods will be: $100+100\frac{0.25}{0.75}=133.33$

If the share of value of fixed capital going to section 1 were $a=0.33$, then the total value transferred to final goods would be: $100+100\frac{0.333}{0.666}=150$

Obviously this is absurd, because there is no such thing as a spontaneous generation of value, and no good can ever transfer an amount of value higher than its own initial value, an amount which moreover would vary with the share of value of fixed capital going to section 1 !

Thus this second example of contradiction clearly shows that persisting in considering fixed capital goods as having a dual nature, both as intermediate and as final goods leads to absurdities. Such a wrong assumption cannot therefore be maintained .

5. Conclusion

At the end of this short note, we are clearly obliged to conclude that the postulate of the transfer of value of fixed capital to the final goods that it helps to produce has no logical basis, and must be definitely abandonned by economic theory.

Moreover economic theory should in no way be confused with commercial accounting, and therefore with the treatment of capital by what is only a standard legal and fiscal practice, consisting in considering the amortization of fixed capital as part of the gross added value of enterprises. But, even though it is presented as such, this is not the price of old capital which is part of the price of the product. In reality it is the price of the product which includes such an amount of profits that it allows for the buying of new fixed capital goods to replace the old ones which have been removed from the production process.

As far as national accounts are concerned, this is the reason why gross domestic product, or GDP, as defined by national accountants, is in fact the total net product of a period including all of the new fixed capital goods produced during this period. The difference betwwen the gross and net product, representing total amortization for the corresponding period, is purely conventional and based on varying and arbitrary fiscal rules. Therefore it has no real economic significance, and should not in any case be considered as a so-called transfer of value of the fixed capital existing at the beginning of this period.

References

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