Chapter 9: Formation of a General Rate of Profit (Average Rate of Profit), and Transformation of Commodity Values into Prices of Production

I The nature of the problem to be solved

To maintain our grip on what Marx is doing in this chapter, we need to recall the conundrum he has just posed.

We have shown [...] that in different branches of industry unequal profit rates prevail, corresponding to the different organic composition of capitals, and, within the indicated limits, corresponding also to their different turnover times; so that at a given rate of surplus-value it is only for capitals of the same organic composition – assuming equal turnover times – that the law holds good, as a general tendency, that profits stand in direct proportion to the amount of capital, and that capitals of equal size yield equal profits in the same period of time. [...] There is no doubt, however, that in actual fact, ignoring inessential, accidental circumstances that cancel each other out, no such variation in the average rate of profit exists between different branches of industry, and it could not exist without abolishing the entire system of capitalist production. The theory of value thus appears incompatible with the actual movement, incompatible with the actual phenomena of production, and it might seem that we must abandon all hope of understanding these phenomena.

In other words, ignoring for the moment differences in turnover time, of the conditions (1) that labour is the source of all new value, (2) that a general rate of profit applies between sectors of production, (3) that a general rate of surplus-value operates between sectors, and (4) that the organic composition of capital varies between sectors, on the face of it only three can coexist at the same time. Yet conditions (2), (3) and (4) are observable facts; and condition (1) is the basis of our entire theory. The existence of a general rate of profit contradicts the determination of value by labour-time: the coexistence of these two factors needs to be explained, as Marx elsewhere puts it, by means of a set of ‘intermediary stages’.

II The formation of a general rate of profit and prices of production

Marx reminds us that the organic composition of capital ‘depends on two factors: firstly, on the technical proportion between the labour-power and the means of production applied, and secondly, on the price of those means of production’; and that it is expressed in percentage terms, i.e. as \( x + y \), where \( x + y = 100 \).

We are going to compare five capitals, each operating in different sectors of production; we are operating under the following assumptions: (1) a constant and universal rate of surplus-value (of 100 %); (2) An annual turnover for all capital.

The capitals are set out in table 1 below.

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1 Where I insert my own subheads they appear, as here, in sans serif type.
2 Karl Marx, Capital volume 3 (Harmondsworth, 1981) [hereafter C3], p.252.
3 Karl Marx, Theories of Surplus-Value vol. 2, in Karl Marx, Theories of Surplus-Value: Books I, II and III (Amherst, NY, 2000) [hereafter TSV2], p.174. ‘[T]he manner in which Ricardo carries out this investigation is the following: He presupposes a general rate of profit or an average profit of equal magnitude for different capital investments of equal magnitude, or for different spheres of production in which capitals of equal size are employed – or, which is the same thing, profit in proportion to the size of the capital employed in the various spheres of production. Instead of postulating this general rate of profit, Ricardo should rather have examined in how far its existence is in fact consistent with the determination of value by labour-time, and he would have found that instead of being consistent with it, prima facie, it contradicts it, and that its existence would therefore have to be explained through a number of intermediary stages, a procedure which is very different from merely including it under the law of value.’
4 C3, p. 254. By ‘price’ here, we may also read ‘value’: cf. C3, pp. 244-5.
5 Marx will almost immediately break this first assumption; though he does comment that ‘we shall ignore for the time being the differences that may be produced here by variation in the turnover times’ (C3, p. 254, italicisation added).
If we treated capitals I-V above as one single (internally differentiated) capital, treated on percentage terms it would have an organic composition of \(78_c + 22_v\); each capital I-V of 100 could then, treated this way, as one fifth of a total capital of 500, be considered as of average organic composition \(78_c + 22_v\), to which accrued an average profit of 22\%, and whose average rate of profit would be 22\%.

Let us now (in order not to arrive at totally incorrect conclusions) assume that not all the constant capital value enters into the product over the year (i.e. we are allowing for different rates of depreciation of fixed capital and for different proportions of fixed and circulating capital within the constant capital). This will have no effect on the rate of profit, but it will affect both the value of the product and the cost price.

The result is shown in table 2 below.

If now – still treating capitals I-V as a single capital – we distribute the average total surplus-value produced among capitals I-V, we may derive the following commodity prices, indicated in table 3.

If we sum the values in the last column, we arrive at zero: “To the same extent that one section of commodities is sold above its value, another is sold below it.” Marx now labels what I have called ‘commodity price of product’ in the above table, and what he has called ‘price of commodities’, prices of production.10

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6 Again, Marx interchanges between ‘price’ and value for this concept: e.g., C3, p. 255.
7 C3, p. 255.
8 If we assume an annual turnover for the circulating capital, that is. (Marx does not say this.)
9 C3, p. 257.
10 ‘Produktionspreise’.
### Table 2: Different and Varying Turnover Times for \( c \)

<table>
<thead>
<tr>
<th></th>
<th>Capitals</th>
<th>Rate of Surplus-Value</th>
<th>Surplus-Value</th>
<th>Rate of Profit</th>
<th>( c ) Used Up</th>
<th>Value of Product ((v + s + c \text{ used up}))</th>
<th>Cost Price ((v + c \text{ used up}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>80(_c) + 20(_v)</td>
<td>100 %</td>
<td>20</td>
<td>20 %</td>
<td>50</td>
<td>90</td>
<td>70</td>
</tr>
<tr>
<td>II</td>
<td>70(_c) + 30(_v)</td>
<td>100 %</td>
<td>30</td>
<td>30 %</td>
<td>51</td>
<td>111</td>
<td>81</td>
</tr>
<tr>
<td>III</td>
<td>60(_c) + 40(_v)</td>
<td>100 %</td>
<td>40</td>
<td>40 %</td>
<td>51</td>
<td>131</td>
<td>91</td>
</tr>
<tr>
<td>IV</td>
<td>85(_c) + 15(_v)</td>
<td>100 %</td>
<td>15</td>
<td>15 %</td>
<td>40</td>
<td>70</td>
<td>55</td>
</tr>
<tr>
<td>V</td>
<td>95(_c) + 5(_v)</td>
<td>100 %</td>
<td>5</td>
<td>5 %</td>
<td>10</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>390(_c) + 110(_v)</td>
<td></td>
<td>110</td>
<td></td>
<td>110 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>78(_c) + 22(_v)</td>
<td></td>
<td>22</td>
<td></td>
<td>22 %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: Prices of Production

<table>
<thead>
<tr>
<th></th>
<th>Capitals</th>
<th>Surplus-Value</th>
<th>( c ) Used Up</th>
<th>Value of Product ((v + s + c \text{ used up}))</th>
<th>Cost Price of Product ((v + c \text{ used up}))</th>
<th>Commodity Price of Product ((v + c \text{ used up} + \text{average } s)) (11)</th>
<th>Rate of Profit (\frac{\text{average } s}{c + v})</th>
<th>Difference Between Value of Product and Commodity Price of Product (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>80(_c) + 20(_v)</td>
<td></td>
<td>20</td>
<td>50</td>
<td>90</td>
<td>70</td>
<td>22 %</td>
<td>+ 2</td>
</tr>
<tr>
<td>II</td>
<td>70(_c) + 30(_v)</td>
<td></td>
<td>30</td>
<td>51</td>
<td>111</td>
<td>81</td>
<td>22 %</td>
<td>– 8</td>
</tr>
<tr>
<td>III</td>
<td>60(_c) + 40(_v)</td>
<td></td>
<td>40</td>
<td>51</td>
<td>131</td>
<td>91</td>
<td>22 %</td>
<td>– 18</td>
</tr>
<tr>
<td>IV</td>
<td>85(_c) + 15(_v)</td>
<td></td>
<td>15</td>
<td>40</td>
<td>70</td>
<td>55</td>
<td>77</td>
<td>22 %</td>
</tr>
<tr>
<td>V</td>
<td>95(_c) + 5(_v)</td>
<td></td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>15</td>
<td>37</td>
<td>22 %</td>
</tr>
<tr>
<td>Total</td>
<td>390(_c) + 110(_v)</td>
<td></td>
<td>110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>78(_c) + 22(_v)</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22 %</td>
</tr>
</tbody>
</table>

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11 Marx labels this column ‘Price of commodities’.

12 Marx labels this column ‘Divergence of price from value’.
The prices that arise when the average of the different rates of profit is drawn from the different spheres of production, and this average is added to the cost prices of these different spheres of production, are the prices of production. Their prerequisite is the existence of a general rate of profit, and this presupposes in turn that the profit rates in each particular sphere of production, taken by itself, are already reduced to their average rates. These particular rates are \( \frac{\pi}{c} \) in each sphere of production and are to be developed from the value of the commodity as shown in the first Part of this volume. In the absence of such a development, the general rate of profit (and hence also the production price of the commodity) remains a meaningless and irrational conception.13

Variation in the composition of capitals functioning in different sectors means that different amounts of labour are set in motion per given size of capital; different amounts of surplus-labour and hence surplus-value are appropriated. Hence the rates of profit which prevail in different sectors of production are originally very different. ‘These different rates of profit are balanced out by competition to give a general rate of profit which is the average of all these different rates.’14

We have a capital of \( 500(c + v) \), composed of 100\( c \) fixed capital, 10 % of which depreciates over the turnover period of \( 400(c + v) \) circulating capital. The average profit for this turnover period is 10 % per cent. If we denote cost price as \( p^c \) and price of production as \( p^p \),15 then:

\[
p^p = 410 + 50 \text{ average profit (10 \% of 500)} = 460
\]

Here, although the capitalists in the different spheres of production get back on the sale of their commodities the capital values consumed to produce them, they do not secure the surplus-value and hence profit that is produced in their own sphere [...]. What they secure is [...] the surplus-value and hence profit that falls to the

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13 C3, p. 257. Where Marx says here ‘a meaningless and irrational conception’ (the other widely extant English translation – cf. Karl Marx, Capital volume 3 (Moscow and London, 1962) – gives us ‘a vague and senseless conception’) (p. 155), in the German he says ‘eine sinn- und begriffslose Vorstellung’. ‘Sinn’ is more or less uncomplicatedly ‘sense’ (as in the ‘sense of a word’). Vorstellung, when it occurs in Marx, is routinely translated as ‘conception’ (and sometimes as ‘representation’); the following comment may help to clarify its use here. ‘Vorstellung [...] comes from Latin ‘repraesentatio’. It [...] doesn’t refer to [...] something corresponding to something else, or describing or symbolising something [...]’. [Rather, it] means something in consciousness: it is an image based on sense perceptions. [...] In other words, Vorstellung combines ‘data’ from (sensual) perception and conceptual ordering [...].’ (j laari, ‘M-TH: Re: Juan’s thesis’ (<http://greenhouse.economics.utah.edu/pipermail/marxism-thaxis/1996-December/002455.html>) Begriff, conventionally ‘concept’ or ‘idea’, was used by Hegel to refer to the ‘sublation’ (Aufhebung) of ‘essence’ and ‘being’, and we can (more or less) think of it as what it is about something that makes it as it is (Begriff is also closely related to the verb begreifen, ‘to grasp’, in the sense of ‘comprehend’). (From the Preface to the Science of Logic ‘the nature, the peculiar essence, that which is genuinely permanent and substantial in the complexity and contingency of appearance and fleeting manifestation, is the notion [Begriff] of the thing [...].’

14 C3, p. 257. The formation of the general rate of profit is thus the result of a process.

15 Marx uses \( k \) to denote cost price.
share of each aliquot part of the total social capital, when evenly distributed, from the total social surplus-value or profit produced in a given time by the social capital in all spheres of production.16

III The multiple determination of prices of production

The two component parts of the price of production – cost price and average profit – are differently determined. Cost price – ‘the portion of [...] [the] commodity price that replaces the parts of the capital that are consumed in [...] production’17 – is ‘completely governed by the outlay within each respective sphere of production’;18 profit, on the other hand is governed ‘by the mass of profit that falls on average to each capital invested, as an aliquot part of the total social capital invested in the total production, during a given period of time. [This] profit [...] is independent of [...] [the] particular sphere of production, it is a simple average per 100 units of capital advanced.’19

Marx now, after previously imagining the five capitals as one single internally differentiated capital, now suggests we think of them as distinct capitals belonging to the same capitalist. The constant and variable capital (the sum of which form a value equal to the cost prices of the commodity products – ‘the least price required to replace the portion of capital that is advanced and consumed’,20 which are ‘different for each kind of commodity [...] and [which] would be fixed differently by the proprietor’21 – are given quantities; as for the profit accruing, however, it would be reasonable for the capitalist to consider it as profit accruing on the total capitalist advanced, such that an aliquot part would fall to each capital. The total price of the commodities produced by the five capitals would therefore be equal to the total value of the commodity product; to put it another way the sum of the cost prices plus the sum of the surplus-value (profit) produced would be equal to ‘the monetary expression for the total quantity of labour, both past and newly added, contained in [the] commodities [...]’. And in the same manner, the sum of prices of production for the commodities produced in society as a whole – taking the totality of all branches of production – is equal to the sum of their values.22

IV Price of production and cost price

Marx now asks: does this not seem ‘contradicted by the fact that the elements of productive capital are generally bought on the market [...]’ so that their prices include an already realized profit and accordingly include the production price of one branch of industry together with the profit contained in it, so that the profit in one branch of industry goes into the cost price of another?’23 No, he answers: what is necessary is that ‘the sum of the cost prices of all commodities in a country is put on one side and the sum of the profits or surplus-values on the other’.24

Take for example a commodity A; its cost price may contain the profits of B, C, D [elements of A’s means of production], just as the profits of A may in turn go into B, C, D, etc. [for which A is an element of means of production]. If we make this calculation [i.e. of cost prices and profits], the profit of A will be absent from its own cost price, and the profits of B, C, D, etc. will be absent from theirs. None of them includes his own profit in his cost price.25

16 C3, p. 258. ‘The various different capitals here are in the position of shareholders in a joint-stock company [...]’
17 C3, p. 258.
18 C3, p. 258.
20 C3, p. 259.
21 C3, p. 259.
22 C3, p. 259.
23 C3, pp. 259-60.
24 C3, p. 260.
In other words, \( A \)'s profit, a component part of the value of its commodity product ('output'), enters as an element of the cost price (value equivalent to that laid out on capital) of \( B \), \( C \), etc., for whom \( A \) is means of production, and not of \( A \)'s own cost price, i.e. value equivalent to the capital that laid out on \( A \); capitalist \( A \) does not buy, on the capitalist market, means of production from itself, but from others – capitalists \( B \), \( C \), \( D \) or whoever. 'So if there are \( n \) spheres of production, and in each of them a profit of \( r \) is made then the cost price in all together is \( p^e - nr \).’

Hence, if

\[
\text{the profits of one sphere of production [as ‘output’] go into the cost price of another [as ‘input’], [...] then these profits have already been taken into account for the overall price of the final end-product and cannot appear on the profit side twice. They appear on this side [i.e. of profit] only because the commodity in question was itself an end-product [a product of capitalist production, sold on the market, for profit] so that its price of production [for which it is sold] does not go into the cost price of another commodity.}
\]

This means that:

If a certain sum \( r \) goes into the cost price of a commodity for the profit of the producers of the means of production [i.e. if the price of an element of means of production bought on the market includes a profit – already realised – \( r \) and on this cost price a profit of \( n \) is added [\( n \) being the profit realised by the second producer on that part of the dead labour entering into the value of the commodity product equivalent to \( r \), profit made by the first], the total profit \( R = r + n \). The total cost price of the commodity, discounting all portions of the price that count towards profit, is then its own cost price minus \( R \).

Thus, if the cost price of the commodity product of the second capital \( = p^e \), and the price of production of its commodity product \( = p^e + R \), then, given that \( R = r + n \), the cost price of this ‘output’ is its price of production minus \( P \), i.e. minus \( p \) and \( p_i \).

Let us be clear however as to what this does and does not say. A capitalist, let us call her \( B \), who buys means of production from another, let us call her \( A \), pays a certain sum of money for these means of production, commodity product of \( A \), whose price of production – all else being equal, which, at this point of exposition, it is – is equivalent in value to \( A \)'s cost price plus (average) profit. This is what \( B \) pays, money equivalent in value to the price of production of \( B \)'s product, value which enters into \( B \)'s commodity product. It is not that \( B \) pays \( A \) the price of production of the latter’s product less her profit, for if this were the case \( A \) would not make the profit she does. \( B \)'s input – and hence her output (which again may well be the input of someone else) – includes the profit made by \( A \) (and by \( C \), who supplies \( A \), and \( D \), who supplies \( C \), and so on). \( B \)'s product's cost price is equal to \( A \)'s product’s price of production, which is in turn equal to \( A \)'s cost price plus average profit. Marx’s point is that were one to calculate the value of the products of \( A \) and \( B \), the dead labour and living labour of which they are composed – constant capital, and variable capital and surplus-value – by summing the totals of cost-prices and profits, then this calculation would need to take account of the fact that the profits of \( A \) – in whole or in part – enter into the value of the product of \( B \), and, that were these profits not subtracted from the total of cost prices, then the total of production prices – cost prices and profits – would overestimate the actual labour contained by the total product. It does not mean that that to calculate the production price of \( B \)'s commodity product taken on its own it is necessary in some way to ‘convert’ – ‘transform’ – the production prices of those elements of constant capital that \( B \) buys on the market, to calculate the production price of \( B \)'s product on the basis of some value other than that which \( B \) actually pays, the actual production – ‘output’ – price of \( A \)'s product.

This is the sense in which Marx makes the following remark:

in volume 1 [...],\(^{29}\) we have already seen that the product of any capital can be treated as if one part simply replaces capital, while the other only represents surplus-value. To apply this method of reckoning to the total

\[ \text{C3, p. 260; really } \Sigma(p^e) - \Sigma(r) \text{ (I have adjusted Marx’s notation to bring it in line with my own).} \]

\[ \text{C3, p. 260.} \]

\[ \text{C3, p. 260. Note here that it is textually evident that for Marx that cost prices are composed of the prices of production – not strict labour values – of other commodities.} \]

\[ \text{Karl Marx, Capital volume 1 (Harmondsworth, 1976), pp. 331-2.} \]
social product, we have to make certain rectifications, since, considering the whole society, the profit contained in the price of flax, for instance, cannot figure twice, not as both part of the price of the linen and as the profit of the flax producers.30

However, ‘[t]here is no distinction between profit and surplus-value when the surplus-value of A, for instance, goes into the constant capital of B [because A’s product’s price of production – cost price plus value – is less than the labour, living and dead, of which it is composed, i.e. its price is below its value].’ Value is value: ‘it is completely immaterial whether the labour contained in [...] commodities is paid or unpaid.’32 That, in this case, there is a redistribution of value from B to A ‘shows only that B pays the surplus-value of A.’33

If the price of B’s product differs from its value, because the amount of surplus-value realised in B differs from the profit added in the price of its products, the same holds for the commodities that enter into B’s product as constant capital, and also for its variable capital. In the latter case, while the average daily wage is equal to the value product of the number of hours that the worker works to produce necessary means of subsistence (necessary labour), the production prices of the necessary means of subsistence also diverge from their values. Nevertheless, whenever more surplus-value goes into one commodity less goes into another; the divergences from value that obtain in production tend to cancel one another out. ‘With the whole of capitalist production, it is always only in a very intricate and approximate way, as an average of perpetual fluctuations which can never be firmly fixed, that the general law prevails as the dominant tendency.’34

In addition, we have to remember that the price of production of one capital enters into the value of the product of another – and hence the profit realised by one capital enters into the value of the product of another by forming a part of the cost price of the constant capital of the second – is a process that occurs successively in time.

If we take a capital A, (part of) whose product forms (part of) the constant capital of a capital B, (part of) whose product in turn forms (part of) the constant capital of A, we can conceive of the process of formation of cost prices and prices of production by following that part of the commodity product whose value is given by the value of the constant capital used in its production (on which an average profit is realised) through successive production processes (and we assume here that the turnover times for all components of both capitals is the same). The results of this are shown in figure 1 on the next page.

In the diagram (if \( p^c = \) cost price; \( p^p = \) production price; and \( \bar{r} = \) average profit), \( p^p_A^{[t=0]} = p^c_A^{[t=1]} \) and \( p^p_A^{[t=1]} = p^c_A^{[t=2]} \).

But \( p^p_A^{[t=0]} = p^c_A^{[t=0]} + \bar{r}_A^{[t=1]} = p^p_B^{[t=0]} + \bar{r}_A^{[t=1]} \)

and \( p^p_A^{[t=2]} = p^c_A^{[t=2]} + \bar{r}_A^{[t=2]} = p^p_B^{[t=1]} + \bar{r}_A^{[t=2]} = p^p_B^{[t=1]} + \bar{r}_B^{[t=1]} + \bar{r}_A^{[t=2]} \)

and so on.

Hence, although the profit realised by one capital enters into the product of another, and even enters into its own product, it does not do so in the same production period but successively over time. Nevertheless, for each capital in each period, the cost price of its means of production is equal to the production price of its producer, and the production price of this part of its product equal to this cost price plus average profit, independently and irrespective of how it was formed.35

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30 C3, p. 260 (italicisation added).
31 C3, p. 260.
32 C3, pp. 260-1.
33 C3, p. 261.
34 C3, p. 261.
35 ‘Marx is quite specific that the concept of production price applies to the determination of the value of new output, and nothing else. The cost-price refers only to the first exchange in the chrematistic circuit (\( M \rightarrow C \)), the production price refers only to the second exchange, (\( C \rightarrow M \)). In between, there is no exchange, only production.’ Jurriaan Bendien, ‘[Marxism]
(In passing, Marx notes here that, in considering the general rate of profit as being formed by the average of the various different rates of profit on each fixed unit of capital advanced over a given period of time we have lost sight of the effect of turnover time. Nevertheless, as we have already had cause to note, turnover time is a decisive factor in the formation of the rate of profit; hence differences in turnover times is something that 'plays a decisive role for the various different rates of profit in the various spheres of production, by means of whose average the general rate of profit is formed.'36)

**V The general rate of profit as an aggregate rate of profit**

The rates of profit in different spheres of production differ because different masses of surplus-value are produced in accordance with the different proportions of variable capital that obtain; hence, the average rate of profit depends on the relative magnitudes of capitals invested in the different spheres.

If we take the four capitals shown in table 4 below we see that the average rate of profit stands at $\frac{\sum(c)}{\sum(c + v)} = \frac{720}{5,500} = 13\frac{1}{11}\%$. It is evident that the average rate of profit is an aggregate rate of profit, and not the average of the individual prevailing rates of profit.

Hence the general rate of profit is determined by two factors:

1. the organic composition of the capitals in the various sectors of production; in other words, the different rates of profit obtaining in the particular sectors;

2. the distribution of the total social capital between these sectors; in other words, the relative magnitudes of

36 C3, p. 261.
the capitals invested in each sector.

**Table 4:** Capitals of different sizes and the general rate of profit

<table>
<thead>
<tr>
<th>Total Size</th>
<th>Composition</th>
<th>Rate of Surplus-Value</th>
<th>Surplus-Value/100 c + v</th>
<th>Rate of Profit</th>
<th>Total Surplus-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>200</td>
<td>80, 25</td>
<td>100 %</td>
<td>25</td>
<td>25 %</td>
</tr>
<tr>
<td>B</td>
<td>300</td>
<td>70, 40</td>
<td>100 %</td>
<td>40</td>
<td>40 %</td>
</tr>
<tr>
<td>C</td>
<td>1,000</td>
<td>60, 15</td>
<td>100 %</td>
<td>15</td>
<td>15 %</td>
</tr>
<tr>
<td>D</td>
<td>4,000</td>
<td>85, 10</td>
<td>100 %</td>
<td>10</td>
<td>10 %</td>
</tr>
<tr>
<td>Total</td>
<td>5,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Marx continues: ‘In Volumes 1 and 2 we were only concerned with the values of commodities. Now a part of this value has split away as the cost price, on the one hand, while on the other, the production price of the commodity has also developed, as a transformed form of value.’ In other words, whereas previously the value of an individual commodity was seen as an undifferentiated mass, whose magnitude was singularly determined by the labour-time socially necessary for its production, now we see the value of the commodity as differentiated, composed of elements whose determination is different. With regard to the production price of a commodity, cost price – ‘the portion of [...] [the] commodity price that replaces the parts of the capital that are consumed in [...] production’ – is ‘completely governed by the outlay within each respective sphere of production’; while average profit is governed ‘by the mass of profit that falls on average to each capital invested, as an aliquot part of the total social capital invested in the total production, during a given period of time. [This] profit [...] is independent of [...] [the] particular sphere of production [...]’

37 C3, p. 263.
38 C3, p. 258.
39 C3, p. 258.
40 C3, pp. 258-9. Cf. Marx to Engels (30 April 1868) (<http://www.marxists.org/archive/marx/works/1868/letters/68_04_30.htm>): ‘What were treated in I as movements, whether of capital in a particular branch of production or of social capital – movements changing its composition, etc. – are now conceived as differences of the various masses of capital invested in the different branches of production.

‘Then it turns out that, assuming the rate of surplus value, i.e. the exploitation of labour, as equal, the production of value and therefore the production of surplus value and therefore the rate of profit are different in different branches of production. But from these varying rates of profit a mean or general rate of profit is formed by competition. This rate of profit, expressed absolutely, can be nothing but the surplus value produced (annually) by the capitalist class in relation to the total of social capital advanced. […]’

‘What the competition among the various masses of capital – invested in different spheres of production and differently composed – is striving for is capitalist communism, namely that the mass of capital employed in each sphere of production should get a fractional part of the total surplus value proportionate to the part of the total social capital that it forms.

[[…]] [T]his means that the price determination of the commodities must deviate from their values.

‘The price thus equalised, which divides up the social surplus value equally among the various masses of capital in proportion to their sizes, is the price of production of commodities, the centre around which the oscillation of the market
If the composition of the average social capital\(^{41}\) is 80\(_c\) + 20\(_v\) and the annual rate of surplus-value, \(\Delta\),\(^{42}\) = 100 %, the average annual profit for a capital of 100 is 20 and the average annual rate of profit is 20 %. Thus, for any cost price \(p^c\) of commodities annually produced by a capital of 100, the production price, \(p^p\), = \(p^c\) + 20; and if, in a given sector, the composition of capital is \((80 - x)_c + (20 + x)_v\), the surplus-value created within this sector, i.e. the annual profit produced, is 20 + \(x\), and the commodity value (\(w\)) produced \(p^c\) + 20 + \(x\) (i.e. \(w > p^p\)). In the same way, in those sectors with a composition of capital is \((80 + x)_c + (20 - x)_v\), profit = 20 - \(x\), and \(w = p^c\) + 20 - \(x\) (i.e. \(w < p^p\)).\(^{43}\) These relations can are summarised in tabular form like this:\(^{44}\)

<table>
<thead>
<tr>
<th>(p^c)</th>
<th>(\Delta)</th>
<th>(p^p)</th>
<th>(s)</th>
<th>(w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80(_c) + 20(_v) = 100</td>
<td>20</td>
<td>(p^c) + 20 = 120</td>
<td>20</td>
<td>(p^c) + 20 = 120</td>
</tr>
<tr>
<td>((80 - x)_c + (20 + x)_v = 100)</td>
<td>20</td>
<td>(p^c) + 20 = 120</td>
<td>20 + (x)</td>
<td>(p^c) + 20 + (x) = 120 + (x)</td>
</tr>
<tr>
<td>((80 + x)_c + (20 - x)_v = 100)</td>
<td>20</td>
<td>(p^c) + 20 = 120</td>
<td>20 - (x)</td>
<td>(p^c) + 20 - (x) = 120 - (x)</td>
</tr>
<tr>
<td>(\Sigma(p^c) = 240(_c) + 60(_v) = 300)</td>
<td>60</td>
<td>(\Sigma(p^c) + 60 = 360)</td>
<td>60</td>
<td>(\Sigma(p^c) + 60 = 360)</td>
</tr>
</tbody>
</table>

Looking at the table, let us note two things here. First, that it is unambiguous that

1. commodity value (\(w\)) = cost price (\(p^c\)) + surplus-value (\(s\))
2. production price (\(p^p\)) = cost price (\(p^c\)) + average profit (\(\bar{r}\))

and that, hence,

(3) \(w - p^p = s - \bar{r}\)

Second, and because of (3), it is also evident that \(\Sigma(s) = \Sigma(\bar{r})\) and \(\Sigma(w) = \Sigma(p^p)\).

Again, Marx emphasises that the price of production enters the next production period as a cost price.

The development given above also involves a modification in the determination of a commodity’s cost price. It was originally assumed that the cost price of a commodity equalled the value of the commodities consumed in its production. But for the buyer of a commodity, it is the price of production that constitutes its cost price and can thus enter into forming the price of another commodity. As the price of production of a commodity

prices moves.

‘Those branches of production which constitute a natural monopoly are exempted from this equalisation process, even if their rate of profit is higher than the social rate.’

\(^{41}\) What Marx elsewhere calls ‘capital in general’.

\(^{42}\) The annual rate of surplus-value, the ratio of the total surplus-value produced in the year and the variable capital laid out at the beginning of the first turnover, given by \(\Delta = \delta \times n\), where \(n\) = the number or turnovers in the year.

\(^{43}\) Marx emphasises here (C3, p. 264) that ‘we must bear in mind that the ratio between \(c\) and \(v\) may depart from the general average not just as a result of a difference in the technical composition, but also simply because of a change in value of the elements of constant capital.’

can diverge from its value, so the cost price of a commodity, in which the price of production of other commodities is involved, can also stand above or below the portion of its total value that is formed by the value of the means of production going into it. It is necessary to bear in mind this modified significance of the cost price, and therefore to bear in mind too that if the cost price of a commodity is equated with the value of the means of production used up in producing it, it is always possible to go wrong.\(^ {45}\)

Marx clarifies:

As a general rule, the principle that the cost price of a commodity is less than its value has been transformed in practice into the principle that its cost price is less than its price of production. *For the total social capital, where price of production equals value, this assertion is identical with the earlier one that the cost price is less than the value. [...] Taking the social capital as a whole, the cost price of the commodities that this produces is less than their value, or than the price of production which is identical with this value for the total mass of commodities produced. The cost price of a commodity simply depends on the quantity of paid labour it contains, while the value depends on the total quantity of labour it contains, whether paid or unpaid; the price of production depends on the sum of paid labour plus a certain quantity of unpaid labour that is independent of its own particular sphere of production.*\(^ {46}\)

Therefore,

The formula that the price of production of a commodity = \(pc + r\), cost price plus profit, can now be stated more exactly; since \(r = \frac{p}{pc}\) (where \(r\) is the general rate of profit), the price of production = \(pc + p \cdot \frac{r}{100}\). If \(pc = 300\) and \(r = 15\%\), the price of production = \(300 + 300 \times \frac{15}{100} = 345\).\(^ {47}\)

VI The determination of the magnitude of prices of production

There are three circumstances in which the production prices of commodities in a particular sector of production undergo changes of magnitude.

1 A change in the general rate of profit independent of the particular sector in question even though while the value of the commodities themselves (dead and living labour going into production) remains the same.

2 A change in the value of the commodities in the particular sector of production itself, either because of technical change or as a consequence of a change in the value of the commodities that enter into its constant capital while the general rate of profit remains the same.

3 By the action of both these factors in concert.

These factors operate over different time scales. A real change in the general rate of profit, i.e. a change not simply a result of economic contingencies, will have been the end result of a whole series of 'protracted oscillations, which require a good deal of time before they are consolidated and balanced out to produce a change in the general rate.'\(^ {48}\) In the short run, changes in production prices are explained by changes in commodity values, i.e. by changes in the sum of labour-time required to produce the commodities (excluding mere changes in the monetary expression of these values).

VII The determination of the magnitude of the general rate of profit

How does the general rate of profit change?

\(^{45}\) C3, pp. 264-5. This sentence is frequently seen as an admission of error on Marx’s part: however, the context makes it clear that it is in fact a warning against error on the part of others.

\(^{46}\) C3, p 265 (italicisation added).

\(^{47}\) C3, p. 265 (Marx’s notation amended in line with my own).

\(^{48}\) C3, p. 266.
If, at the level of total social capital, the sum of values of the commodities produced by it\(^ {49} =\) total value of constant capital + total value of variable capital + total surplus-value, assuming a fixed rate of surplus-value (exploitation of labour) – which means that the mass of surplus-value is constant – the rate of profit can only change (but will change) if (1) the value of constant capital changes; (2) the value of the variable capital changes; (3) both change (without balancing each other out). In each of these three circumstances \( C (c + v) \) changes, and therefore \( \frac{s}{C} \) (rate of profit) changes. Therefore, in these cases, ‘a change in the general rate of profit assumes a change in the value of the commodities which enter as formative elements into the constant capital, the variable capital, or both simultaneously.’\(^ {50} \)

If the value of the commodities is constant, the general rate of profit will change if the rate of surplus-value (level of exploitation of labour) changes.

If the rate of surplus-value is constant, a change in the sum of labour applied to the constant capital as a result of technical changes in the labour process will result in a change in the general rate of profit (but this kind of technical change always results in a change in value of commodities whose production now needs less (or more) labour).

VIII  The increasingly inscrutable nature of the determination of value

We have seen that surplus-value and profit in terms of their magnitude are identical, but that the rate of surplus-value and the rate of profit are very different: the rate of profit can rise or fall even if the rate of surplus-value remains the same. From the perspective of the capitalist, all that matters is the rate of profit, and because this measures surplus-value against the total capital the origin of the former is obscured and mystified. In this way, the ‘organic distinction between constant and variable capital is obliterated’.\(^ {51} \) But in the first part of the volume, the distinction between surplus-value and profit was no more than that of a change of form, rather than magnitude.

Now, however, that a general rate of profit has been established, we see that profit and surplus-value are as a rule different magnitudes. The formation of average profit ‘takes place behind his [the capitalist’s] back. He does not see it, he does not understand it, and it does not in fact interest him.’\(^ {52} \) With the establishment of a general rate of profit, the true nature and origin of profit is ‘now completely conceal[ed], not only for the capitalist, who has here a particular interest in deceiving himself, but also for the worker.’\(^ {53} \)

Up to now,

all economics [...] has either violently made abstraction from the distinctions between surplus-value and profit, between rate of surplus-value and rate of profit, so that it could retain the determination of value as its basis, or else it has abandoned, along with this determination of value, any kind of solid foundation for a scientific approach, so as to be able to retain those distinctions which obtrude themselves on the phenomenal level. This confusion on the part of the theorists shows better than anything else how the practical capitalist, imprisoned in the competitive struggle and in no way penetrating the phenomena it exhibits, cannot but be completely incapable of recognising, behind the semblance, the inner essence and the inner form of this process.\(^ {54} \)

\(^{49}\) ‘[O]r, expressed in money, their price’ (C3, p. 266); i.e., price = value expressed in money.

\(^{50}\) C3, p. 266.

\(^{51}\) C3, p. 267.

\(^{52}\) C3, p. 268.

\(^{53}\) C3, p. 268.

\(^{54}\) C3, pp. 268-9.
From this point of view, that of the capitalist (as well as the political economist), the saving of labour – employing less workers – and a greater use of constant capital (deal labour) appears economically rational, since a reduction in the quantity of labour needed for production seems to be the immediate source of increasing profit; thus, that living labour is the exclusive source of profit is further obscured.

In a given sector of production, a rise of fall in the portion of the cost price which represents constant capital accordingly affects the cost price of the commodity: it simply costs the capitalist more or less. But if the productivity of labour changes, the quantity of labour required for the production of a certain amount of commodities changes, even if the number of workers, and hence the outlay on wages, stays the same. But when reckoned at the level of the individual commodity, this change means that each will now contain more or less labour, paid and therefore unpaid too, and hence a greater or smaller portion of the wages. The commodity’s cost price thus changes (although there is no change in average profit).

With regard to variable capital, if, say, £100 represents the wages of 100 workers who, with a given working day, produce a weekly product of 200 units of a commodity (200C), then 1C – ignoring that part of the cost price arising from the constant capital – costs 10 shillings. If now the productivity of labour doubles, the same number of workers produce twice this 400C in the same time as they previously took to produce 200C. Now, for that part of the cost price that consists in variable capital, 1C = 5 shillings. This change in the labour time necessary for production now appears with regard to cost price (and therefore too to the price of production) as a different distribution of the same wages over more commodities. What the capitalist sees, therefore (and, notes Marx, the political economist too), is that the part of the paid labour represented in each item of the commodity product changes with the productivity of labour, and, as a consequence, the value of each individual item changes too. What she does not see that this is also the case with the unpaid labour represented in each item, something made even more difficult by the fact that the average profit is only ‘adventitiously’ determined by the unpaid labour expended in this sector. ‘The fact that the value of commodities is determined by the labour they contain now continues to percolate through only in this unrefined and inscrutable form.’

IX A simple reproduction scheme

Let us imagine an economy, composed of three sectors: a sector A, which produces means of production, a sector B, which produces workers’ means of subsistence, and a sector C, which produces capitalists’ means of subsistence. In the framework of the reproduction schemes laid out in Capital volume 2, sector A composes on

55 My word: C3, p. 272 gives ‘accidentally’ for Marx’s original ‘nur zufällig’.

56 C3, p. 272, which gives ‘crudified and naive form’ for Marx’s ‘vergröberter und begriffsloser Form’ (and in the Moscow edition (p.169) ‘crude and meaningless’); see my note 13 above.

57 This essence of this model (including its numerical content) is taken directly from Andrew Kliman, Reclaiming Marx’s ‘Capital’: A Refutation of the Myth of Inconsistency (Lanham and Plymouth, 2007), pp. 148-52, although a good deal of the gloss on the model here is mine. Kliman’s model is based on the argument developed in Andrew Kliman and Ted McGlone, ‘The Transformation Non-Problem and the Non-Transformation Problem’ Capital and Class 35 (1988), pp. 56-83, a paper reproduced in an updated form as Andrew Kliman and Ted McGlone, ‘One System or Two? The Transformation of Values into Prices of Production vs. the Transformation Problem’ Alan Freeman and Guglielmo Carchedi (eds.), Marx and Non-Equilibrium Economics (Cheltenham, 1996), and available on Kliman’s own website here: <http://akliman.squarespace.com/>. In my opinion, this material, taken together, stands as the definitive refutation of the view that Marx, in chapter 9 of volume 3, failed to constrain the ‘input’ prices of one production period to the ‘output’ prices of the same period – a procedure known as ‘simultaneous valuation’ – and that (1) Marx was wrong not to have done this, (2) that had he done this, as he should have done, the aggregate equalities he observes – that, at the level of total social capital, total price = total value, total profit = total surplus-value, and, therefore, that aggregate ‘price’ rate of profit = aggregate ‘value’ rate of profit – do not hold, and (3) as a consequence his value theory is internally contradictory (i.e. wrong). This view, originally propounded by Ladislaus von Bortkiewicz at the beginning of the twentieth century, has subsequently come to enjoy popularity not only among opponents of Marx’s theories, but also among Marxists themselves – considering those who take a position on such matters, among probably a majority.

its own department I, and sectors B and C department II. Here, we shall only be considering simple reproduction: we shall be assuming that the capitalists consume all surplus-value (profit) unproductively, rather than accumulating it.

In volume 2, Marx establishes that the condition for ‘balanced’ simple reproduction is $I = (v + s) :$ the value components $v + s$ of department I’s commodity capital (and therefore an equivalent part of department I’s commodity product) must be equal to the value of department II’s constant capital (IIc) similarly precipitated out as a proportionate part of its commodity product. ‘This [...] basic condition of Simple Reproduction [...] says simply that the value of the constant capital used up in the consumption goods branch must be equal to the value of the commodities consumed by the workers and capitalists engaged in producing means of production. If this condition is satisfied, the scale of production remains unchanged from one year to the next.’ What is fundamental to the idea of ‘balanced’ reproduction is that the outflows and inflows of each department must balance (for otherwise there would be commodity product unsold): that the means of production that flow from department I to II have the same value as the means of subsistence (of both capitalists and workers) that pass from department II to I. In Marx’s model, the remaining means of production are disposed of among the capitals of department I, as the remaining means of subsistence are among the capitals of department II. In terms of the diagram of commodity flows in figure 2 below, then, if department I’s sales = $v_I + s_I$, and its purchases = $v_I + s_I$, then $I = v_I + s_I$. By the same token, if department II’s sales = $v_{II} + s_{II}$, and its purchases = $v_{II} + s_{II}$, then $II = v_{II} + s_{II}$. I, and again, $I = v_{II} + s_{II}$. In volume 2, Marx goes into some detail into how these exchanges, both between and among the departments, are mediated; the details of these mediations do not concern us directly here and may be taken as read.

59 And let us recall the reason behind such a division of total social capital, that, for Marx, one of the fundamental specificities of capitalist production is the separation of the worker from the means of production, a separation of which the separation between means of production and means of subsistence is a consequence and reflection. In chapter 1 of volume 2 he wrote: ‘[...] the conditions for the realization of labour-power, i.e. means of subsistence and means of production, are separated, as the property of another, from the possessor of labour-power. [...] The capital relation arises only in the production process because it exists implicitly in the act of circulation, in the basically different economic conditions in which buyer and seller confront one another, in their class relation. [...] If the sale of one’s own labour-power (in the form of the sale of one’s own labour, or the wage form) is not an isolated phenomenon, but the socially decisive precondition for the production of commodities [...], this [...] implies the occurrence of historic processes through which the original connection between means of production and labour-power was dissolved; processes as a result of which the mass of the people, the workers, come face to face with the non-workers, the former as non-owners, the latter as the owners, of these means of production. [...] Thus the situation that underlies the act $M–C–C’$ is one of distribution; not distribution in the customary sense of distribution of the means of consumption, but rather the distribution of the elements of production themselves, with the objective factors concentrated on one side, and labour-power isolated from them on the other. [...] We have already seen how capitalist production, once it is established, not only reproduces this separation in the course of its development, but also expands on an ever greater scale until it has become the generally prevailing social condition. (C2, pp. 114-7.)

60 ‘Simple reproduction [...] seems to be an abstraction, both in the sense that the absence of any accumulation or reproduction on an expanded scale is an assumption foreign to the capitalist basis. [...] But since, when accumulation takes place, simple reproduction still remains a part of this, and is a real factor in accumulation, this can also be considered in itself.’ C2, pp. 470-1.

61 One might also say ‘equilibrium’, though this word has accumulated such a weight of meaning in this context that perhaps it is better to avoid it. Here, by ‘balanced’, what I wish to indicate is that all the product of the two departments is sold, that no money reserves build up, such that reproduction may continue in an identical fashion in principle – given that we are considering simple reproduction – ad infinitum.


63 Mediations that arise from the fact that the circulation of capital forms a part of general commodity exchange, and commodity exchange takes the form not of $C–C$ but of $C–M–C$. ‘Marx’s reproduction schemas summarise the turnover of capital and commodities as a dual movement, [...] meaning] that they are based upon a combined dual flow – a flow of value produced in the process of production, and a flow of money (money revenue and money capital) unleashed in the process
The commodity exchanges that balanced simple reproduction requires in these terms are summarised diagrammatically (with flows commodities indicated by the arrows – with money understood to be flowing in the opposite direction – and the values of these commodities indicated by the labels $c_I, v_I, s_I$, etc.;\(^{64}\) means of production are indicated in blue and means of subsistence in red) in figure 2 below.

The modification we are making here to this model is the separation in department II of that sector (sector B) that produces means of subsistence produced for the workers of the three sectors and that (sector C) which produces means of subsistence for the capitalists. It should be noted here that this distinction is not necessarily one of the type of product that the sectors produce: the output of sector C is not in its entirety a ‘luxury’ product, for much of what capitalists consume will be in its nature ‘necessary’ means of subsistence, indistinguishable in essential form from what workers consume (although it is reasonable to assume a ‘luxury’ component to the product as well). The distinction is rather grounded who buys and thus consumes the product. The efficacy of this distinction will become clear as we develop the analysis (if it is not so already). The three-sector two-department model is illustrated in figure 3 on the next page (now, flows of means of production are indicated in blue, flows of workers’ means of subsistence in red and flows of capitalists’ means of subsistence in green).

The necessity for equality of sales and purchases for each sector now yields the following necessary equalities:

- **sector A:** purchases $= c_A + v_A + s_A$; sales $= c_A + c_B + c_C$; \(\therefore (v + s)_A = c_{(B+C)} \) (1)
- **sector B:** purchases $= c_B + v_B + s_B$; sales $= v_A + v_B + v_C$; \(\therefore (c + s)_B = v_{(A+C)} \) (2)
- **sector C:** purchases $= c_C + v_C + s_C$; sales $= s_A + s_B + s_C$; \(\therefore (c + v)_C = s_{(A+B)} \) (3)

(Equality (1) is the transposition of $c_{II} = v_I + s_I$ into the three sector model.)

Let us adopt the following starting conditions:

- **A:** $280_r + 72_p$
- **B:** $80_r + 96_p$
- **C:** $40_r + 72_p$

of circulation in order to realise the value of the commodities produced. The schemas are evidently not based upon barter: department I does not “exchange” goods with department II simply according to “mutual need”. Before the capitalists or employed workers of department I can obtain the goods they need, they must prove themselves to have sufficient purchasing power to buy them from department II [...]." Ernest Mandel, ‘Introduction’, C2, p. 25.

\(^{64}\) The expression $c_{I}$, for example, should be read to mean ‘a sum of value equivalent to the constant capital advanced in the means of consumption sector’. This sum of value can clearly take different natural (i.e. use-value) forms.
The organic compositions \(g = \frac{c}{c + v}\) of the three sectors are:

- Sector A: \(G_A = \frac{280}{352} \approx 79.5\%\)
- Sector B: \(G_B = \frac{80}{176} \approx 45.5\%\)
- Sector C: \(G_C = \frac{40}{112} \approx 35.7\%\)

The rate of surplus-value \(\delta = \frac{s}{v}\), which is uniform (and, for the moment, constant), = \(66\frac{2}{3}\%\). This gives us the following for the value of the commodity product \(w\)

- Sector A: \(w_A = 280c + 72v + 48s = 400\)
- Sector B: \(w_B = 80c + 96v + 64s = 240\)
- Sector C: \(w_C = 40c + 72v + 48s = 160\)

Finally, the three rates of profit \(\pi = \frac{s}{c + v}\) are:

- Sector A: \(\pi_A = \frac{48}{352} \approx 13.6\%\)
- Sector B: \(\pi_B = \frac{64}{176} \approx 36.4\%\)
- Sector C: \(\pi_C = \frac{48}{112} \approx 42.9\%\)

All of this is summarised in table 6 below. It is important to be aware that the values in the columns for \(c, v, s\), are \(w\) are values, expressed, as Marx repeatedly and transparently does throughout his account of simple and
expanded reproduction in volume 2, as units of money of an unspecified currency\textsuperscript{65} (where Marx deals with actual \textit{sums} of money, he specifies the currency as pounds sterling), while the values for $g$, $\delta$ and $\pi$ are percentages.

Conceived thus, simple reproduction will proceed in perpetuity. The three equalities hold. At the end of each production period, the capitalists of each advance the same value of $c + v$ as in the previous production period, while unproductively consuming the surplus-product (in the form of the commodity product of sector C).

\begin{table}[h]
\centering
\caption{three-sector, two-department simple reproduction}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
sector & $c$ & $v$ & $s$ & $w$ & $g$ & $\delta$ & $\pi$ \\
\hline
I & A & 280 & 72 & 48 & 400 & 79.5 & $\frac{2}{3}$ & 13.6 \\
\hline
II & B & 80 & 96 & 64 & 240 & 45.5 & $\frac{2}{3}$ & 36.4 \\
\hline
C & & 40 & 72 & 48 & 160 & 35.7 & $\frac{2}{3}$ & 42.9 \\
\hline
\textbf{totals} & & 400 & 240 & 160 & 800 & & & \\
\hline
\end{tabular}
\end{table}

But here, of course, we are interested in what happens when a \textit{general rate of profit} is imposed.

From the above table, we can see that the aggregate rate of profit, given by \( \bar{\pi} = \frac{\sum g}{\sum (c + v)} = \frac{160}{640} = 25\% \). The price of production \( (p^e) \), = cost price \( (p^c = c + v) \) plus general profit \( \bar{\pi} \) for each sector, which differs from the value of the commodity product, \( w \), in function of the difference between the surplus-value \textit{produced} in each sector and the \textit{profit} appropriated by each sector, is given in table 7 on the following page.

Here, we can see clearly that the aggregate equalities – total production price = total value; total profit = total surplus-value; aggregate production price rate of profit = aggregate value rate of profit – hold. The question is: can the total social capital reproduce itself?

\textsuperscript{65}‘It is because the commodity is exchange value that it is exchangeable for money, is posited = to money. The proportion of its equivalence with money, i.e. the specificity of its exchange value, is \textit{presupposed} before its transposition into money. The proportion in which a particular commodity is exchanged for money, i.e. the quantity of money into which a given quantity of a commodity is transposable, is determined by the amount of labour time objectified in the commodity. The commodity is an exchange value because it is the realisation of a \textit{specific} amount of labour time; money not only measures the amount of labour time which the commodity represents, but also contains its general, conceptually adequate, exchangeable form. Money is the physical medium into which exchange values are dipped, and in which they obtain the form corresponding to their general character. Adam Smith says that labour (labour time) is the original money with which all commodities are purchased. As regards the act of production this always remains true (as well as in the determination of relative values). In production, every commodity is continuously exchanged for labour time. The necessity of a money other than labour time arises precisely because the quantity of labour time must not be expressed in its immediate, particular product, but in a mediated general product; in its particular product, as a product equal to and convertible into all other products of an equal labour time; of the labour time not in a particular commodity, but in all commodities at once, and hence in a particular commodity which represents all the others.’ Karl Marx, \textit{Grundrisse} (Harmondsworth, 1973), pp. 167-8.
**Table 7**: Three-sector, Two-department Simple Reproduction: Imposition of a General Rate of Profit; Production Period \( t=x \)

<table>
<thead>
<tr>
<th>Sector</th>
<th>( c )</th>
<th>( v )</th>
<th>( s )</th>
<th>( \delta )</th>
<th>( w )</th>
<th>( \pi )</th>
<th>( \mu )</th>
<th>( \rho^\circ )</th>
<th>( \rho^\circ )</th>
<th>( w - \rho^\circ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>I A</td>
<td>280</td>
<td>72</td>
<td>48</td>
<td>( \frac{2}{3} )</td>
<td>400</td>
<td>13.6</td>
<td>25</td>
<td>88</td>
<td>352</td>
<td>440</td>
</tr>
<tr>
<td>II B</td>
<td>80</td>
<td>96</td>
<td>64</td>
<td>( \frac{2}{3} )</td>
<td>240</td>
<td>36.4</td>
<td>25</td>
<td>44</td>
<td>176</td>
<td>220</td>
</tr>
<tr>
<td>III C</td>
<td>40</td>
<td>72</td>
<td>48</td>
<td>( \frac{2}{3} )</td>
<td>160</td>
<td>42.9</td>
<td>25</td>
<td>28</td>
<td>112</td>
<td>140</td>
</tr>
<tr>
<td>Totals</td>
<td>400</td>
<td>240</td>
<td>160</td>
<td>( \frac{2}{3} )</td>
<td>800</td>
<td>25</td>
<td>25</td>
<td>160</td>
<td>640</td>
<td>800</td>
</tr>
</tbody>
</table>

In the model of reproduction set out in volume 2, Marx conceived of the quantitative exchanges between and within departments purely in terms of commodity values; however, although it is largely implicit in his account, it is explicit elsewhere in the volume\(^66\) that the case is that the reproduction of the total social capital is a movement which is ‘not only a replacement of values, but a displacement of materials, and is therefore conditioned not just by the mutual relations of the value components of the social product but equally by their use-values [...]\(^67\) In other words, balanced reproduction not only requires a quantitative balance of exchanges of value, but a balance of physical quantities of use-values. Nevertheless, at the level of abstraction of volume 2, the question of the equalisation of the rate of profit does not arise; and, given the assumptions of the model of reproduction – uniform and constant rate of surplus-value, constant level of productivity of labour – once the quantitative value conditions for the exchange of commodities between departments have been established, and the assumption that these conditions also satisfy the physical balance of the exchange of commodity products as use-values is understood, then the per-unit price of the commodity product is by definition fixed, and the balanced reproduction of capital is guaranteed. Now, however, by imposing a general rate of profit, the per-unit price is not fixed: commodities that once exchanged at value, will now exchange at production price.

At the end of period \( t=x \), the capitalists of sector A hold a commodity product whose production price = 440 (compared with a value of 400); sector B a product of 220 (value 240); and sector C a product of 140 (value 160). The capitalists of each sector, to maintain production on the same scale in \( t=x+1 \), need to buy means of production and labour-power in the same quantities as at the start of \( t=x \). Now, however, the price of these

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\(^66\) For example: ‘The means of production to be purchased must be sufficient in quantity and volume to employ [...] [a given] amount of labour. Thus \( M-C<_{\text{np}}^{L} \) does not simply express the qualitative relationship in which a certain sum of money [...] is transformed into means of production and labour-power of a corresponding sum, but also a quantitative ratio between the portions of the money spent on labour-power [...] and on means of production [...], this ratio being conditioned from the start by the excess or surplus labour that the number of workers involved have to expend. [...] Under all circumstances the part of the money that is spent on means of production – the means of production bought [...] – must be sufficient, i.e. must be reckoned up from the start and be provided in appropriate proportions. To put it another way, the means of production must be sufficient in mass to absorb the mass of labour which is to be turned into products through them. If sufficient means of production are not present, then the surplus labour which the purchaser has at his disposal cannot be made use of; his right to dispose of it will lead to nothing. If more means of production are available than disposable labour, then these remain unsaturated with labour, and are not transformed into products.’ (C2, pp. 110-11)

\(^67\) C2, p. 470.
commodities is *not* equal to their value, *not* equal to their price at the start of \( t = \tau \); now, these commodities need to be bought and sold at their *production price*, and in the necessary physical quantities.

We now examine the commodity exchanges that must, and do, take place, step by step; to convert the commodity value of a given quantity of commodity product into its production price we shall use the procedure of multiplying the value of this quantity by the ratio \( \frac{p^R}{w^R} \) for the relevant sector. The details of each step are set out in the summary in table 8 below.

1. At the end of \( t = \tau \), sector A needs to buy means of production and means of workers’ subsistence in the same *quantity* as at the beginning of \( t = \tau \), but now at their production price. They thus need to buy \( 280 \times \frac{440}{400} = 308 \) of means of production, and \( 72 \times \frac{220}{240} = 66 \) means of workers’ subsistence. The 308 means of production are bought and sold within sector A: the monetary sales and purchases hence cancel each other out. The net monetary balance is hence -66, and \( 440 - 308 = 132 \) commodity product remains to be sold. Sector B, at this point, has sold 66 commodity product and has a net monetary balance of 66.

2. The capitalists of sector B also have to buy the same quantity of means of production and labour-power to continue production on the same scale as before, but again now at the new price of production. They thus buy \( 80 \times \frac{440}{400} = 88 \) of means of production from sector A, and \( 96 \times \frac{220}{240} = 88 \) means of workers’ subsistence from within sector B. This latter set of sales and purchases cancels out in monetary terms. Now, A has sold a product of 88, leaving \( 220 - 88 = 132 \) unsold. But in step 1, 66 means of workers’ subsistence was sold to A: unsold product thus stands at \( 132 - 66 = 66 \). Money receipts stand at 88 spent and received (on workers’ means of subsistence within sector B), 88 spent on means of production and 66 received from A in return for means of workers’ subsistence (in step 1); all this leaves a monetary balance of -22.

In A, whose balance at the end of step 1 was product unsold = 132 and monetary receipts = -66, 88 product has now been sold to B; unsold product therefore now stands at \( 132 - 88 = 44 \), and monetary receipts -66 + 88 = 22.

3. The capitalists of sector C too have to buy the same quantity of means of production and labour-power to continue production on the same scale as before. They buy therefore \( 40 \times \frac{440}{400} = 44 \) means of production from A and \( 72 \times \frac{220}{240} = 66 \) means of workers’ consumption from B. With these purchases A has now sold the last of its commodity product, and its monetary receipts stand at \( 22 + 44 = 66 \). B too has sold all its product, with monetary receipts = -22 + 66 = 44. C has spent 110, and so far holds its entire commodity product (= 140) unsold.

4. Capitalists A spend their monetary balance of 66 on C’s commodity product – capitalists’ means of subsistence – and consume it unproductively; capitalists B likewise spend 44 on C’s product, and consume it unproductively too.

5. The capitalists of sector C now hold \( 140 - 100 = 130 \) product (capitalists’ means of subsistence). This they consume unproductively – effectively through a process of mutual exchange which generates 30 of monetary income and 30 of purchases simultaneously.

All product is thus sold – and bought – at the new production prices.

There are, however, a number of features of what has happened that we need – to summarise what we have seen – to take note of.

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68 And we shall take it as evident that the price at which a commodity is sold is the same as that at which it is purchased.

69 Or, to coin a word, ‘transform’.
First. At the end of period $t=x$ and beginning of $t=x+1$ (and it is fundamental to grasp here that the end of $t=x$ and the beginning of $t=x+1$ coincide in time) the capitalists of all three sectors need to sell (or to have sold) the commodity product produced in $t=x$ and buy the means of production and labour-power necessary (i.e. in the necessary quantities) to continue production in $t=x+1$. Once this is done, the surplus that remains may be unproductively consumed: the monetary receipts which remain are used to buy capitalists’ means of subsistence from sector C. Now, considering ‘normal’ simple reproduction, i.e. simple reproduction without the imposition of a general rate of profit, it is transparently obvious that the surplus the capitalists have at their disposal is given by

$$s = w - (c + v),$$

i.e. by the value of the product produced during the production period less the capital advanced at its beginning. But this way of looking at the matter obscures what is really going on, and makes it difficult to analyse what happens when a general rate of profit is imposed.

If what capitalists have to do is sell the product produced during $t=x$ and buy the factors of production for $t=x+1$, then the surplus they are able to dispose of is given by

$$w_{t=x} - (c_{t=x+1} + v_{t=x+1}),$$

where $w_{t=x} = c_{t=x} + v_{t=x} + r_{t=x}$. In words, the capitalists’ disposable surplus in a given sector is given by the difference between the total value (or price) of the commodity product produced in that sector in one production period and the value (or price) of the means of production and labour-power necessary to continue production in that sector in the next production period. Under conditions of ‘normal’ simple reproduction, where commodity prices do not change between production periods, $s = r$, and $c_{t=x+1} = c_{t=x}$ and $v_{t=x+1} = v_{t=x}$ respectively, giving the appearance that the disposable surplus is equal to the total value produced in a given period less the capital laid out at the start of that period (i.e., $s = w - (c + v)$). But once we impose a general rate of profit, and commodity prices change between production, we see that this is not the case, for now $c_{t=x+1}$ and $v_{t=x}$, and $c_{t=x+1}$ and $v_{t=x}$, are of different magnitudes.

| Table 8: Step-by-step sale and purchase of commodity product: end of $t=x$ / beginning of $t=x+1$ |
|---|---|---|
| A | B | C |
| **Sector** | **Product sold** | **Money received** | **Money spent** | **Product sold** | **Money received** | **Money spent** | **Product sold** | **Money received** | **Money spent** |
| 1 | 308 | 308 | 308 | | | | | | |
| | | 66 | 66 | 66 | | | | | |
| 2 | 88 | 88 | 88 | | | | | | |
| | | | 88 | | | | | |
| 3 | 44 | 44 | | | | | | | |
| | | 66 | 66 | | | | | |
| 4 | | | 66 | 66 | 66 | | 44 | 44 | 44 |
| | | | | | | 30 | 30 | 30 |
| **Totals** | 440 | 440 | 440 | 220 | 220 | 220 | 140 | 140 | 140 |

If we denote total capitalists’ surplus as $i$, then that available at the beginning of period $t=x+1$

$$i_{t=x+1} = w_{t=x} - (c_{t=x+1} + v_{t=x+1}),$$

$$= c_{t=x} + v_{t=x} + r_{t=x} - (c_{t=x+1} + v_{t=x+1})$$
If production is to continue on the same physical scale in \( t=x+1 \) as in \( t=x \), then the cost of the means of production and labour-power that needs to be bought in at the beginning of \( t=x+1 \) is given by the production price of those components at the end of \( t=x \), hence, for a given sector \( X \),

\[
\varepsilon_X^{t=x+1} = \varepsilon_X^{t=x} \times \frac{P_A^{t=x}}{P_A^{t=x-1}},
\]

i.e. the price of the means of production to be bought in at the beginning of period \( t=x+1 \) in sector \( X \) is given by the product of the price of the means of production bought in at the beginning of period \( t=x \) and the ratio between the production price of that sector producing means of production’s commodity product at the end of \( t=x \) and the production price of that product at the end of the previous period (in our example here, the production price of the product of \( A \) at the end of \( t=x-1 \) is its value, i.e. here \( P_A^{t=x-1} = c_A^{t=x} + v_A^{t=x} + s_A^{t=x} \)).

Likewise,

\[
\varepsilon_X^{t=x+1} = \varepsilon_X^{t=x} \times \frac{P_B^{t=x}}{P_B^{t=x-1}}.
\]

One of the conditions of balanced ‘normal’ simple reproduction was \( c_c + v_c = s_A + s_B \). But, evidently, \( w_c = c_c + v_c + s_c \). From the first relation we get \( c_c = s_A + s_B - v_c \). Substituting this into the second, we get \( w_c = s_A + s_B - v_c + v_c + s_c = s_A + s_B + s_c \), i.e. that the total value product of sector \( C \) must = the total value surplus product of sectors \( A, B \) and \( C \) combined for balanced reproduction to occur.

Under conditions of an operating general rate of profit, this condition, that \( w_c = s_A + s_B + s_c \), needs to be modified to

\[
P_C^{t=x} = c_A^{t=x+1} + c_B^{t=x+1} + c_C^{t=x+1},
\]

in words, that the price of production of the product of sector \( C \) at the end of \( t=x \) must be equal to the aggregate disposable surplus at the beginning of \( t=x+1 \).

The commodity flows that occur at the end of \( t=x \)/beginning of \( t=x+1 \) are indicated in figure 4 below.

**Figure 4:** Three-sector, two-department simple reproduction with an operating general rate of profit: commodity product flows (end of \( t=x \)/beginning of \( t=x+1 \))
Production period $t=x+1$ is indicated in table 9 on the next page; the column $i$ indicates the disposable surplus available to the capitalists at the start of the period ($= t=x$) which is exchanged for the product of sector C produced in $t=x$.

The table indicates clearly the second feature of simple reproduction under conditions of an operating general rate of profit that we need to account for. It will be seen that the total value product (and therefore total price) for the period stands at 840, 40 higher than in period $t=x$. How is this?

The answer is that the capital laid out on means of production at the beginning of $t=x+1$ has risen (by 40): because the price of means of production has risen between $t=x$ and $t=x+1$ (i.e. $p^m_{t=x+1} > p^m_{t=x}$), also by 40. This extra 40 is passed on to the value of the commodity product of $t=x+1$. Two important conclusions flow from this.

The first is that the value of means of production passed on in production to the commodity product is equal to the price paid by the capitalist for those means of production (their production price at the end of the preceding period). In other words, if value diverges from price, it is the latter that is passed on as a value component of the value of the commodity product, not the former. But this ‘extra’ value is not ‘extra’ in the sense that it has been conjured out of thin air: it is extra in the sense that it is surplus produced in $t=x$ that has necessarily (to continue production on the same scale) had to be accumulated in $t=x+1$. Our definition here of ‘simple’ reproduction has been to assume the meaning of ‘simple’ as the maintenance of the scale of production in physical terms: and it is the change in the price of the factors of production from $t=x$ to $t=x+1$ that means that maintenance of this physical scale of production requires a different value of capital to be laid out at the start of each of the periods (and it is this that accounts for the fact that the surplus available to the capitalists at the start of $t=x+1$ is different from that produced during $t=x$, i.e. that $s^{i+1} ≠ s^i$).

### Table 9: Production period $t=x+1$

<table>
<thead>
<tr>
<th>sector</th>
<th>$i$</th>
<th>$c$</th>
<th>$v$</th>
<th>$s$</th>
<th>$δ$</th>
<th>$w$</th>
<th>$π$</th>
<th>$π^c$</th>
<th>$τ$</th>
<th>$ρ^c$</th>
<th>$ρ^p$</th>
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<tbody>
<tr>
<td>I</td>
<td>A</td>
<td>66</td>
<td>308</td>
<td>66</td>
<td>54</td>
<td>81</td>
<td>9/11</td>
<td>428</td>
<td>14.4</td>
<td>27.3</td>
<td>102</td>
<td>374</td>
</tr>
<tr>
<td>II</td>
<td>B</td>
<td>44</td>
<td>88</td>
<td>88</td>
<td>72</td>
<td>81</td>
<td>9/11</td>
<td>248</td>
<td>40.9</td>
<td>27.3</td>
<td>48</td>
<td>176</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>30</td>
<td>44</td>
<td>66</td>
<td>54</td>
<td>81</td>
<td>9/11</td>
<td>164</td>
<td>49.1</td>
<td>27.3</td>
<td>30</td>
<td>110</td>
</tr>
<tr>
<td>totals</td>
<td></td>
<td>140</td>
<td>440</td>
<td>220</td>
<td>180</td>
<td>81</td>
<td>9/11</td>
<td>840</td>
<td>27.3</td>
<td>27.3</td>
<td>180</td>
<td>660</td>
</tr>
</tbody>
</table>

At the aggregate level, the total cost price at the beginning of $t=x+1$ is 20 more than at the beginning of $t=x$: although 40 more constant capital has been laid out, 20 less variable capital is necessary (because of the fall in the price of the means of workers’ subsistence). Hence the difference between the surplus available at the beginning of $t=x+1$ ($s^{t=x+1}$) and the surplus produced in $t=x$ ($s^{t=x}$), which is 20. But no new value is produced in $t=x+1$: if we assume that the level of labour productivity is constant then by definition $v + s$ across production periods is constant. Here, at the beginning of $t=x+1$, the value of $v$ has fallen, because the price of workers’ means of subsistence has fallen (effectively wages have fallen): if $v + s$ is constant, and $v$ falls, then $s$ rises, and $\frac{s}{v}$, the rate of surplus-value, rises too. The aggregate rate of surplus-value in $t=x = \frac{160}{240} = 66.7\%$; that in $t=x+1 = \frac{180}{220} \approx 81.8\%$. We see too that the aggregate rate of profit has also risen, from 25% to $\approx 27.3\%$; that the rate of rise in the rate of profit is less than the rate of rise of the rate of surplus-value is due to the rise in the aggregate value composition of capital, from 62.5% in $t=x$ to $\approx 71.0\%$ in $t=x+1$. We recall from chapter...
that the rate of profit is dependent on both the rate of surplus-value and on the value composition of capital, in the relation \( \pi = \frac{\delta_p}{C} \); here, what we see is a rise in the rate of surplus-value partially offset by a rise in the value composition of capital.

In addition, let us recall the distinction Marx made in the previous chapter with regard to the ratio of value proportions between variable and constant capital between what he calls a ‘technical’ relation, a relation between a definite quantity of living labour and a definite quantity of objectified labour in physical – use-value – form and a ‘value’ relation, which expresses the relation between a definite quantity of living labour and a definite quantity of objectified labour as labour. The change in the value composition of capital we see here belongs to the latter category, not the former.

After the ‘disruption’ occasioned by the (purely arbitrary on our part) imposition of a general rate of profit in \( t=x \), the system ‘settles down’, such that, taking all values to two decimal places, by \( t=x+23 \) the system again reproduces itself in unchanging fashion, but now at new commodity prices (period \( t=x+23 \) is illustrated in table 9 below; period \( t=x+24 \), and all other following periods, are identical).

### Table 9: Production period \( t=x+23 \)

<table>
<thead>
<tr>
<th></th>
<th>( i )</th>
<th>( c )</th>
<th>( v )</th>
<th>( s )</th>
<th>( \delta )</th>
<th>( w )</th>
<th>( \pi )</th>
<th>( \bar{p} )</th>
<th>( p^c )</th>
<th>( p^p )</th>
<th>( g )</th>
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</thead>
<tbody>
<tr>
<td>I</td>
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<td>10.2</td>
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<td>B</td>
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<td>108.0</td>
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<td>268.0</td>
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<td>19.4</td>
<td>40.2</td>
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<tr>
<td></td>
<td>C</td>
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<td>74.1</td>
<td>45.9</td>
<td>61.9</td>
<td>174.0</td>
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<td>19.4</td>
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<td>540.0</td>
<td>247.0</td>
<td>153.0</td>
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<td>940.0</td>
<td>19.4</td>
<td>19.4</td>
<td>153.0</td>
<td>786.9</td>
<td>940.0</td>
</tr>
</tbody>
</table>

Note that now that commodity prices do not change between production periods, \( i = \bar{p} \), i.e., the surplus available after the capital necessary for one production period has been laid out is equal to the general profit appropriated within the sector in the preceding period.

Note also the significant price inflation that has occurred as a result of the continued accumulation of the surplus of preceding periods to buy in the means of production and labour-power necessary for succeeding ones. (But also note Marx’s comment earlier in the chapter that ‘[i]f a certain sum \( r \) goes into the cost price of a commodity for the profit of the producers of the means of production and on this cost price a profit of \( r \) is added, the total profit \( R = r + r \) [such that] [t]he total cost price of the commodity, discounting all portions of the price that count towards profit, is then its own cost price minus \( R \).’)

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70 C3, pp. 161-2.
71 C3, pp. 243-5.
72 C3, p. 260.