

Notes on Adam Smith's Theory of Price

SUMMARY: In the “early and rude state” of the world, before there were capitalists and landlords, the whole of the produce of the worker belonged to the worker. However, once the means of production are in the hands of capitalists, the value the worker’s labour adds to the means of production is shared between worker and capitalist in the forms of wages and profit. Under these circumstances, it is no longer the case that the relative prices of commodities are directly proportional to their labour values. This state of affairs, which in Marx falls under the problematic of the “transformation problem”, was something that it is clear Smith was fully aware of, and understood. It is also the case that Smith’s “resolution” of the price of a commodity into the components of wages, profit and rent, a procedure rejected by Marx on theoretical grounds, leads to powerful insights into the relationship between the labour embodied in commodities and their relative prices, which are in turn entirely consonant with the standpoint taken by Marx on the issues involved.

KEYWORDS: Smith, *Wealth of Nations*, relative prices, Marx, *Capital*, transformation problem

I

In the “early and rude state of society[,] which precedes both the accumulation of stock and the appropriation of land”, says Smith, what governs the ratios in which commodities exchange with one another (i.e. their relative prices) is “the proportion between the quantities of labour necessary for acquiring” them. (Smith evidently includes “producing” within the category of “acquiring”.) “If among a nation of hunters,” he says, “it usually costs twice the labour to kill a beaver which it does to kill a deer, one beaver should naturally exchange for or be worth two deer.” (Smith, 1981, 65.)

What determines relative prices here is thus the direct labour expended on (or required for) production.

Smith does not at this stage consider how the price of instruments of production or raw materials will affect relative price, but, from his analysis as it unfolds, it is clear (as we shall later see) that the cost of materials used up or consumed in production enters too into price.

Let then the money price of the quantity of a given commodity produced in a given period of time (say, one day) be p ,¹ and let the money cost of the materials used up or otherwise consumed in its

¹ When Smith uses the word “price” in its most literal sense he seems to regard it as synonymous with “exchangeable value” (e.g. Smith, 1981, 46), which in turn is equivalent to *relative* price, and although he is aware of the difficulty of the variation in the value of the money commodity (Smith, 1981, 50-51), for everyday accounting purposes he seems to accept the utility of *nominal* price, i.e. price designated in units of money (Smith, 1981, 55). (I shall abstract here from the *market* price of the commodity which Smith sees as determined through

production be c (we assume throughout, unless stated otherwise, constant labour productivity). On the sale of the commodity, what the producers receive as income will be the difference between p and c , which we shall call l , such that

$$(I.1) \quad p = c + l.$$

(In the special case of the producers incurring no costs as they produce (should the hunters kill beavers and deer with their bare hands, for example) then

$$(I.1a) \quad p = l,$$

i.e. the whole price is the producer's income.)

Under the circumstances described in (I.1) (and (I.1a)), it is clear, argues Smith, that “the whole produce of labour belongs to the labourer”. (Smith, 1981, 65.)

(Here, by the “produce of labour” we should understand *the monetary expression of the producers' direct labour*, i.e. a given amount of productive labour measured in time, expressed in monetary units, as determined by the price the commodity fetches on the market. This magnitude is the *residual* of price after subtracting the cost of materials consumed in production. And if no materials are consumed in production, it is *equal* to price.)

Under these conditions, if there is free movement of producers between productive activities, then l will be equalised across producers as producers move towards activities of greater remuneration.²

II

The circumstance just described holds as long as producers are in command of their own means of production. Once this ceases to be the case, however, once, in other words, “stock has accumulated in the hands of particular persons”, circumstances change. Some of those who have accumulated (i.e. capitalists) will employ a part of their stock to employ others, whom they will supply with what Smith calls “materials” (means of production), and subsistence (a wage). They (the capitalists) do this so as to “make a profit by the sale of their [the labourers'] work, or by what their labour adds to the value of the materials [supplied].” (Smith, 1981, 66.) Now, “over and above what may be sufficient to pay the price of the materials, and the wages of the workmen, something must be given for the profits of the undertaker of the work who hazards his stock in this adventure.” (Smith, 1981, 66.)

But where does this profit come from? “The value which the workmen add to the materials [...] resolves itself in this case into two parts, of which the one pays their wages, the other the profits of their employer”. (Smith, 1981, 66.)

For Smith, profit is thus a *deduction* from what the labourers produce; now, once stock has been accumulated, it is no longer the case that “the whole produce of labour belongs to the labourer”. One

the short-run action of demand and supply (Smith, 1981, 73); here I am only concerned with what Smith calls “natural price”, the “central price, to which the prices of all commodities are continually gravitating”. (Smith, 1981, 75.)) Hence the unit of measurement in what here follows in this discussion is, unless stated otherwise, *money*.

² Commodities the production of which results in a higher income for producers will attract producers from productive activities where incomes are lower; supply will then expand and price will fall, reducing income in the higher-earning activities to the point where the attraction of producers ceases.

part of the “produce of labour” (“what their [the labourers] labour adds to the value of the materials” supplied) is equal to the value of the wage, and the other to the profit that accrues to the owner of stock. Now,

$$(II.1) \quad l = v + s,$$

where s is the capitalist's profit, and v the labourer's wage.

Note that nothing has happened to change our definition of l as the residual of price after costs have been subtracted; all that has changed is the *distribution* of l between producers (workers) and capitalists. Equation (I.1) remains true, but now, because of equation (II.1), we can also write

$$(II.2) \quad p = v + s + c.$$

There is a difficulty looming, however. Smith assumes an equalised profit rate (what he calls “ordinary profit”), enforced by competition between capitalists (e.g. Smith, 1981, 77). But profit is due on both what the capitalist advances for “materials”, and what she advances for the wage, i.e. “upon the whole stock of materials and wages which he [the capitalist] advanced.” (Smith, 1981, 66) Thus, if the *rate* of profit, equal for all producers, is π , then

$$(II.3) \quad s = \pi \cdot (v + c)$$

and

$$(II.4) \quad p = v + \pi \cdot (v + c) + c,$$

or

$$(II.4a) \quad p = (v + c) \cdot (\pi + 1).$$

So imagine now two different masses of two different commodities, a and b , each the result of the same amount of direct labour (say, one day), but one requiring materials with a cost of c_a , and the other c_b , and then let $c_a > c_b$.

Previously, we had assumed that the free movement of direct producers between productive activities would equalise l . Now, now that l is shared with the capitalists, the free movement of the producers in search of the highest income will equalise v . In other words, “competition” among producers will equalise the wage *level*, at the same time as competition among capitalists will equalise the profit *rate*. Given this, from equation (II.3) we see that, all else being equal, s will increase with c . But equation (II.1), tells us that, for a constant v , if s changes, then l will change too s , and by the same amount.

What does this mean? This means that if $c_a > c_b$, say, then $l_a > l_b$, *even though the amount of direct labour required for production for both commodities is the same*. All else being equal, an increase in the cost of means of production used up in the production of a commodity will increase its price not only by the increment of the means of production cost but by the sum of this increment and the profit at the “ordinary” rate on it. But this means in turn that if both the wage level and profit rate remain unchanged then the monetary expression of the direct labour embodied in the commodity must also rise. In other words, the monetary expression of direct labour time *is now in part dependent on the ratio of money advanced as wages and money advanced as means of production* (in Marx's terms, on the “value composition” of capital). As Smith puts it, “with the accumulation of stock”, “the quantity of labour [...] employed in [...] producing any commodity [is now no longer] the only circumstance which can regulate the quantity which it ought commonly to purchase, command, or exchange for.” (Smith, 1981, 67.)

This is the *exact* same issue that Marx addresses in his discussion of the transformation of “commodity values” (*Warenwerte*) into “prices of production” in the second part of *Capital* III. The price envisaged by Smith, as set out in equation (II.4a), is essentially his version of Marx’s “price of production”.

III

In addition to the profit due to the capitalist in virtue of her advancing her stock, there is also the matter of the rent due to the landlord: once “the land of any country has all become private property”, Smith notes, the owners of this land (who “love to reap where they never sowed”) demand a rent for its produce. (Smith, 1981, 67.)

Rent, for Smith, is a price forced from the agricultural producer through the landlord’s monopoly control over the land. (Smith, 1981, 161.) Like profit, rent too (according to Smith) is a deduction from the new value created by labour. Prior to the ownership of land, Smith says, what had previously “cost the labourer only the trouble of gathering [...], [now] come[s] [...] to have an additional price fixed upon [...] [it]. He [“the labourer”] *must then [...] give up to the landlord a portion of what his labour [...] produces*. This portion [...] constitutes the rent of land [...].” (Smith, 1981, 67, italicisation added.)

But, unlike the direct and indirect labour required for production, rent does not for Smith contribute to the determination of the magnitude of price. For Smith, price formation is analytically *prior* to the determination of rent: it is price that determines rent, not the other way round, for a high commodity price will as a consequence yield a high rent, he argues, while a low one a low rent, or no rent at all. (Smith, 1981, 162.) At the same time, however, and notwithstanding this, the level of rent will still be such that the agricultural producer will still reap an “ordinary” profit. (Smith, 1981, 160.)

It is clearly impossible to reconcile these propositions. If rent is a deduction from the produce of the labourer, then, if wages are given, it is not possible to see how the agricultural producer can still reap an equalised profit *and* pay rent *if* the magnitude of price is determined analytically prior to the determination of the level of rent. (The superiority of Marx’s understanding of rent as a form taken by surplus profit here is clear.)

IV

For Smith, then, any given commodity price will contain a component which is equal to the wages paid to the worker, another component equal to the profit due to the capitalist, and a further equal to the rent of the landlord (even if it may be the case, says Smith, that “in the most improved societies” there may be commodity prices the rent component of which is zero. (Smith, 1981, 69.)) In addition, a commodity’s price will also contain an element equal to the cost of the means of production used up in its production. We can therefore represent the price of any commodity as

$$(IV.1) \quad p = v + s + r + c,$$

Where p is the price of the given mass of the commodity in question produced in a given time (say, one day)—from here on, this mass is what “per unit” refers to; v , the per-unit money wage; s , the per-unit profit that accrues to the capitalist; r , per-unit rent accruing to the landlord; and c , the per-unit materials cost (the cost of means of production, including depreciation or amortisation costs).

But then Smith argues the following. Not only each commodity price taken individually, but also the total mass of commodity prices in the aggregate, “finally” “resolves itself into some one or other or all of those three parts [i.e. wages, profit and rent]; so that of all the commodities which compose the whole annual produce of the labour of every country, taken complexly, must resolve itself into the same three parts, and be parcelled out among different inhabitants of the country, either as the wages of their labour, the profits of their stock, or the rent of their land.” (Smith, 1981, 69.) The *entire commodity product* of a society, in other words, is parcelled out among the three great classes that make up any given society, and forms in this way their sources of revenue: wages for the workers, profits for the capitalists, and rent for the owners of land.

But if price is no more than the sum of wages, profit, and rent, then what of the cost of the “materials” supplied by the capitalist, the value of which must be recouped by the sale of the commodity in whose production they have served so that production itself may continue? Smith is aware of the difficulty. He takes the case of the farmer who produces corn: clearly, there is indeed an element of price “necessary for replacing the stock of the farmer, or for compensating the wear and tear of his labouring cattle, and other instruments of husbandry”. (Smith, 1981, 68.) But what the capitalist is forced to purchase under these concepts *itself* has a price, which *too* “resolves itself” into wages, profit and rent. “Though the price of [...] corn [...] may pay the price as well as the maintenance of the horse, the whole price still resolves itself *either immediately or ultimately* into the same three parts of rent, labour, and profit.” (Smith, 1981, 68, italicisation added.) This is the sense of Smith’s formulation that price “resolves” itself “*finally*” into the component parts of wages, profit and rent. Even though the “immediate” price of a commodity may be broken down into wages, profit, rent and materials, this last item, which is no more than the sum of the prices of a set of commodities, may in turn be broken down into wages, profit, rent and materials, and so on, *ad infinitum*.³

We may represent the matter like as follows.

Starting from the representation of the “per-unit” (as defined above) price of a given commodity that we saw earlier,

$$(IV.1) \quad p = v + s + r + c,$$

we may isolate c , which is just the price of a bundle of commodities, and represent it as

$$(IV.2) \quad c = v_1 + s_1 + r_1 + c_1,$$

where the subscript indicates a “stage” of production analytically “prior” to that represented in equation (IV.1), which itself we might now rewrite as

$$(IV.3) \quad p = v + s + r + (v_1 + s_1 + r_1 + c_1).$$

We can repeat this procedure, and write:

³ It is relevant to note here that Marx was vehement in his opposition to Smith’s “decomposition” procedure, calling it “Adam Smith’s dogma”, and dedicated (amongst other places) no small amount of the third part of *Capital* II to pointing out why he thought it was wrong. “The statement that the entire price of commodities is either ‘immediately’ or ‘ultimately’ resolvable into $v + s$ would only cease to be an empty subterfuge if Smith could demonstrate that the commodity products whose price is immediately resolved into c (the price of the means of production consumed) + $v + s$ are finally compensated for by commodity products which entirely replace these ‘consumed means of production’, and which are for their part produced simply by the outlay of variable capital, i.e. capital laid out on labour power. The price of these latter commodities would then immediately be $v + s$. And in this way the price of the former, too, $c + v + s$, where c stands for the component of constant capital, would be ultimately resolvable into $v + s$.” (Marx, 1978, 450.)

$$(IV.4) \quad c_1 = v_2 + s_2 + c_2$$

and therefore

$$(IV.5) \quad p = v + s + r + (v_1 + s_1 + r_1 + [v_2 + s_2 + r_2 + c_2]).$$

This procedure is evidently in principle infinitely recursive.

Given that each iteration of c ($c_1, c_2, c_3 \dots$) will clearly be smaller than the previous, i.e. that $c > c_1 > c_2 > c_3 \dots$, in the limit c_n tends to zero. This allows us to write

$$(IV.6) \quad p = v_T + s_T + r_T,$$

where v_T is the infinite series $(v + v_1 + v_2 + v_3 \dots)$, s_T the series $(s + s_1 + s_2 + s_3 \dots)$, and r_T $(r + r_1 + r_2 + r_3 \dots)$.

These infinite series v_T , s_T and r_T , the sums of *analytically successively prior* stages of wages, profit and rent, are what are referred to in the literature as “vertically integrated” magnitudes.⁴

This mathematical formalisation of Smith's verbal argument is suggested by Pierro Sraffa (in the “Appendix A: On “Subsystems”: Sraffa (1960, 89)), although Sraffa (curiously) does not reference Smith. In our analysis here, each of v_T , s_T and r_T represents the quantity of, respectively, wages, profit and rent “directly and indirectly ‘embodied’ in each physical unit” (Pasinetti (1977, 76)) of the commodity in question.

V

The concept of “vertical integration” also appears in the work of Anwar Shaikh, with the following interesting results.⁵

Starting from the premise that (by definition) any kind of price can be broken down into costs and profit, we may write:

$$(V.1) \quad p = C + s,$$

where p (as above) is the price of a given unit of commodity (i.e. that produced in a given time period); C , the commodity's per-unit costs; and s , its per-unit profit.

C may then be broken down as follows:

$$(V.2) \quad C = v + c,$$

where v is the per-unit wage cost, and c the cost of means of production (including fixed capital depreciation), such that the price p may now be represented as

$$(V.3) \quad p = v + s + c.$$

Following Smith's “decomposition” procedure as described above, we can go on to represent c like this:

$$(V.4) \quad c = v_1 + s_1 + c_1,$$

⁴ The term “vertical integration” seems to have originated in the work of the post-Sraffian economist Luigi Pasinetti. (Pasinetti, 1977, 74-6.)

⁵ Shaikh (1984, 62-71) and (2016, 69 and 385-8).

such that, if we repeat this step recursively, we arrive at

$$(V.5) \quad p = v_T + s_T,$$

where v_T is the “vertically integrated” wage component and s_T “vertically integrated” profits. (This is the same result as (IV.6) above, except that we have taken no account of rent. The justification for this omission is that we can follow Marx and conceive of rent as he does—and, interestingly, as does Smith interest (Smith, 1981, 69-70)—as redistributed *profit*.)

Let us turn our attention to the wage cost component v . For any per-time-unit commodity price, we may in turn decompose v as the product of the wage *level*—the sum paid per worker per period of time—on the one hand, and the *number of workers* employed in the direct production of the commodity on the other. Let us call these two variables respectively W and L , such that

$$(V.6) \quad v = W \cdot L.$$

Given that we have assumed a physical quantity of commodity produced in a given time period (say, one day) then L here is a direct measure of labour time (assuming a one-day working period, one worker, L , is equal to one day; $2L$, two days; etc.).

Earlier, we defined the infinite series v_T as

$$(V.7) \quad v_T = v + v_1 + v_2 + \dots$$

If v is the direct wage component of p , then v_1 is that of c , and v_2 that of c_1 , and so on. Thus v_1 , v_2 , v_3 , and so on, being the *direct* wage components of c , c_1 , c_2 , etc., are evidently the *indirect wage components* of p .

Then, assuming a given (equalised) wage level W , combining (V.6) and (V.7) gives us

$$(V.7a) \quad v_T = W \cdot L + W \cdot L_1 + W \cdot L_2 + \dots,$$

or

$$(V.7b) \quad v_T = W \cdot (L + L_1 + L_2 + \dots),$$

or

$$(V.7c) \quad v_T = W \cdot L_T,$$

with L_T being the sum on the one hand of the direct labour inputs (measured in time) for the production of the commodity in question and on the other all the indirect direct labour inputs that enter into its production (this latter being the sum of the direct labour inputs for the means of production, the means of production of the means of production, and so on). L_T , being the sum of direct and indirect labour time, is, in Marx's terms, *value*, measure in time.

On the other hand, s_T is vertically integrated *profit*: the sum on the one hand of the profit embodied by the commodity in question and on the other of the indirect profit components embodied by the means of production that enter into the production of the commodity in question.

If we write s_T , like this

$$(V.8) \quad s_T = v_T \cdot \frac{s_T}{v_T},$$

and then call $\frac{s_T}{v_T}$ the “vertically integrated profit-wage ratio”,⁶ and denote it Q , we can then rewrite (V.5) like this:

$$(V.9) \quad p = W \cdot L_T + W \cdot L_T \cdot Q,$$

or

$$(V.9a) \quad p = W \cdot L_T \cdot (1 + Q).$$

Equation (V.9a) tells us something very important: it tells us that the price of the mass of a given commodity produced in a given time period (here, a day) is the product of two factors: the sum of direct and indirect labour time required for its production (L_T), and the ratio of vertically integrated wage costs to profit (Q).

Thus armed, we may now compare any two commodity prices,⁷ say p_1 and p_2 , like this:

$$(V.10) \quad \frac{p_1}{p_2} = \frac{L_{T_1} \cdot (1 + Q_1)}{L_{T_2} \cdot (1 + Q_2)},$$

(The wage-level W , which we are assuming equalised, and thus at any given moment constant, cancels out).

Equation (V.10) means quite simply the following. The ratio of any two commodity prices will be the same as the ratio of the labour time required for their production *to the extent that the ratio of integrated wage-profit ratios is the same*. To the degree that this latter is different, the ratio of prices will *not* be the same as the ratio of labour times.

But under what circumstances will the profit-wage ratio vary between different commodities? Given the total labour time necessary for the production of a given quantity of commodity, and assuming a common wage *level*, the ratio of integrated wages to integrated profits will vary with the variation of the mass of money profit produced. Given constant labour time (direct and indirect), constant wages, and a constant *rate* of profit, the *mass* of profit will vary in function of the total *quantity* (in money terms) of capital advanced in production. But if the wage costs (variable capital)—the product of labour time and the wage level—are constant, then the quantity of capital can only vary with the variation of the quantity of *constant* capital advanced for production. The profit-wage ratio, under these assumptions, therefore functions as a proxy for Marx's value composition of capital, the ratio between the sum of constant capital (money capital advanced to buy means of production) to variable capital (money advanced as wages) in a given production process.

This means that, given that

⁶ This vertically integrated profit-wage ratio is the inverse of what we might call the “vertically integrated rate of surplus value” (or rate of exploitation), the rate of surplus value being, in Marx, the ratio of surplus-value (profit in its most immediate form) to variable capital, i.e. wages, which is, in turn the ratio of surplus labour time to necessary labour time. Both magnitudes—the vertically integrated profit-wage ratio and vertically integrated rate of surplus value—are measures of the *class* division of what Marx calls the “value product” (“*Wertprodukt*”): the value created in production and shared between workers and capitalists in the forms respectively of wages and profit. (Marx, 1978, 388, 413, 451, etc.)

⁷ These need not necessarily be the prices of different commodities; p_1 could, for example, be what Marx calls a commodity's “value price” (“*Wertpreis*”) (Marx, 1981, 275) and p_2 its price of production.

$$(V.11) \quad Q = \frac{s_T}{v_T},$$

assuming v_T constant means that Q rises with s_T , i.e. rises with the quantity of constant capital to variable capital, i.e. with the value composition of capital. It follows from this, for example, that the prices of two commodities requiring the same amount of total labour time for their production will differ proportionally to the value composition of their production processes. This is *exactly* the result that we identified in Smith in section **II** above. It is also *exactly* the conclusion that Marx comes to in the second part of *Capital* III, where he observes a *transfer* of surplus value (profit) produced under conditions of a lower value composition of capital to those of a higher composition under assumptions of an equalised rate of profit and, therefore, prices of production.

Note too here that in Smith's "early and rude state", where "the whole produce of labour belongs to the labourer", there is no *profit*: s_T is zero and Q is zero, and commodity prices are directly proportional to labour times.

In addition, equation (V.9a) (and, by extension, also equation (V.10)) also tells us the following. Given a commodity's vertically integrated profit-wage ratio (whatever it may be), all else being equal, an increase in the labour time required for its production will result in a rise in its price (*however otherwise its price be determined*), and a decrease in labour time required a fall. This is *precisely* what Marx calls "the law of value" ("das Wertgesetz").⁸

⁸ "Whatever may be the ways in which the prices of different commodities are first established or fixed in relation to one another, the law of value governs their movement. When the labour time required for their production falls, prices fall; and where it rises, prices rise, as long as other circumstances remain equal." (Marx, 1981, 277.)

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