# Piero Sraffa and 'The Production of Commodities by Commodities'.

For Marx social production is distinctive human activity historically evolved, the most complex choreography society engages in. The contradiction found in a market economy between private production and social consumption whereby production divides society while exchange unites it, results in producers only being connected through the commodities they exchange. (1) This direct connection between things is the starting point for all vulgar economics because objects are identified by their outer usefulness rather than their inner commonness.

Although Sraffa belongs to the school of vulgar economics, strictly speaking, Sraffa is also attached to the period of the USSR when material-balances-planning dominated its economy. This is often overlooked because he was one of the 'giants' in the Cambridge Debates which raged in the 1950s and 1960s and which included economists such as Samuelson, Solow and Robinson. This article does not refer in any way to these debates, to their outcomes or their shortcomings.

Rather it focuses narrowly on Sraffa's affinity to material balances production, although this is seldom discussed against the noise of the Cambridge debates which academics keeps pawing at and turning over. Planning in the USSR was done on the basis of matching inputs with outputs with alienated labour being considered yet another input, but one eagerly hoarded by enterprises. Sraffa's equations and his treatment of inputs and outputs as physical rather than social would have been at home in Gosplan. Whether Sraffa methodology was encouraged by the apparent success of planning in the USSR at the time is a worthy question. However, today we all know how piece rate planning ended up. In that sense Sraffa is not only a vulgar economist but a fraudulent one as well, because the whole purpose of planning in the USSR was to defraud the worker of his or her labour by dismissing labour time as the essential organiser, economiser, and motivator of production.

In a society connected solely by the products being exchanged, the labour of the producers takes the form of the value of the products being exchanged. Abstract value represents the undifferentiated labour found in all commodities, while their exchange values (ratios) represent the amounts of this labour found in each commodity measured by the time taken to apply it. (2) As is to be expected, the capitalists deny that value and therefore their wealth, originates from the production process. However through the back door, their doubts leak out over and over again, for example whenever they complain how wages are eating into their profits, or that wage rises are sparking price rises, or their fear over the impact of strikes, or their delight at the rise in the productivity of labour, or their concern when demographics turn negative (the supply of new labourers). These doubts continuously shadow the self-entitled capitalist.

This critique shows it is not necessary to read the whole of Sraffa's slim volume, particularly the main body of it, which has been the subject of such intense debate. Rather, this critique avoids the mathematics and the theorems found later by showing that Sraffa's pre-amble is so flawed it renders what follows irrelevant. Within the first few pages, Sraffa's assumptions when tested against labour times, are shown to be baseless annulling whatever follows. He provides just enough detail to show that in real life, not in the twilight world of forced abstractions conjured up by mathematics, his world would break down immediately. His treatise is therefore without any merit.

All ratios in this critique are those provided by Sraffa.

Value, labour time, exchange ratios, consumption ratios, technical ratios, inputs-outputs

**The pamphlet itself. Chapter 1.**

Sraffa begins his pamphlet by leading us down that winding rural path trodden by so many economists towards a hypothetical and simple economy where only wheat and iron tools are produced at first. The tools are necessary to farm and the reward for both the farmers and forgers are wheat. (For simplicity we will measure output on both sides in tons rather than quarters for wheat.) Sraffa proposes an exchange relationship of 10 parts wheat to 1 part farming tools (iron). He does not explain how these balances are arrived at, but he must assume that in order to produce 400 tons of wheat 20 tons of iron in the form of tools are needed with 12 consumed in producing wheat itself (exchanged) and 8 in producing the iron tools themselves.

Immediately we encounter a problem. It is just as likely that wheat is consumed producing wheat as iron is consumed producing iron. We think of the seed crop. If all the wheat is consumed, there would be no crop the following year and Sraffa would have had to abandon his example. To assist Sraffa we can assume that 40 tons of seed crop has been brought forward from the previous year and 40 tons will be carried forward to the next year leaving a net crop of 400 tons. (Traditionally 2 bushels of seeds produced about 20 bushels of wheat per acre. Thus unlike Sraffa's convenient numbers, these are authentic historical numbers.) [(3)] Here is the first evidence of sloppiness on the part of Sraffa although it conforms to his logic that outputs consume inputs without any residual products.

We further assume that this 400 tons of wheat are needed to nourish the forgers and farmers (including their families) each year. Of this 400 tons of wheat, it appears that 280 tons are consumed by the farmers and 120 tons are consumed by the forgers due to the fact that the forgers provide 12 tons of iron tools to the farmers and receive back 120 'quarters' of wheat according to Sraffa

Immediately our attention is drawn to the fact that forgers and farmers do not share the same level of productivity. In his first table Sraffa gives a technical ratio of 10 tons of wheat to 1 ton of tools (we shall avoid quant quarters). As a result, the output of both industries can be measured by means of wheat which is the purpose of this production. Here will assume 440 tons of wheat as output and 20 tons of iron tools as output. Thus in terms of the expenditure of labour, the farmers produce 440 tons of wheat while the forgers produce 200 tons of wheat-equivalent making up a hypothetical 640 tons of wheat based on Sraffa's ratios. The social product of this community is therefore equivalent to 640 tons of wheat.

It follows that the production of wheat measured by labour time should also be in the order of 69% vs 31% or 440/640 vs 200/640. [(4)] This works out at 276 tons for the farmers vs 124 for the forgers. Not the figure given by the exchange of 12 tons of iron which would result in a ratio of 280 tons for the farmers and 120 for the forgers. In this case the forgers would be underpaid by 4 tons of wheat because some of the labour which went into producing the iron which produced the iron, equal to 8 tons, has gone 'unpaid'. (differences due to rounding up.) In terms of embodied labour time, the 12 tons of iron being exchanged would equal 124 of wheat not 120 of wheat. The 8 tons used up like the 40 tons of seed used up cannot be disregarded, because both represent labour expended. But this is exactly what Sraffa ignores, suggesting it is sufficient to map out the physical quantities being exchanged thereby denying these products have value to their producers. This is arrogantly anti-working class.

Now if we assume the biological necessity that each labourer requires 1/4 ton of wheat each year equivalent to 1 million calories, it follows that 400 tons of wheat can feed 1600 members of this community though the proportion of labourers cannot be determined. We will assume half are labourers at any time the rest family members. These labourers are divided between the two spheres

so that 70% are farmers and 30% are forgers (Sraffa's ratios). Therefore, prior to exchange, 560 farmers (70%) produce 440 tons of wheat or 0.79 tons each, whereas 240 (30%) forgers produce iron equal to 200 tons of wheat equivalent or 0.83 tons per worker. This output being different to the output exchanged. The weighted average for all production therefore is 0.8 ton per worker which means the farmers' productivity is below average and the forgers' productivity is above average. (If the forgers' output is instead measured by exchange, 120 versus 200, then the forger's productivity would fall to 0.5 tons dragging down the weighted average to 0.65 tons per worker. No longer would they be considered more productive, but it would be an error to adopt that view.)

Before proceeding it is important to recognise why Sraffa designated 70% of the community to be farmers leaving 30% to be forgers. This conforms to the exchange of iron amounting to 12 tons, or 120 wheat divided by 400 wheat = 30%. If the division of the 20 tons of iron into used-up tools and exchanged tools, was 10 tons + 10 tons, then the ratio he would have adopted would have been 75% farmers and 25% forgers. In other words Sraffa is shifting the producers around according to the shift in iron between the two types of producers. This is a self-serving assumption.

We could therefore conclude that Sraffa is implying value arises only in exchange rather than production itself, otherwise the community would not accept these divisions. And this is borne out by his consumption figures. Using Sraffian proportions of 70:30, after exchanging 280 for 120, each farmer's family consumes ½ ton or 1000 lbs (560 families consume 280 tons) of wheat while each forger's family also consumes ½ ton (240 consume 120 tons).

And yet if we turn away from these exchange ratios and examine embodied value, recognising that value arises in production rather than exchange, it turns out that in terms of productivity, the farmers are being overpaid and the forgers underpaid. Earlier we saw that the productivity of a forger was 5% higher than a farmer (0.79 tons of wheat per farmer vs 0.83 tons per forger) That being so, each farmer should only be entitled to consume 975 lb of wheat not 1000 lb and each forger 1025 lbs based on embodied value when measured by labour time (relative productivity).

Embodied labour time would suggest a 69%:31% split not a 70%:30% split. Therefore a relationship, unbeknown to Sraffa, of exploitation exists. The farmers are indirectly exploiting the forgers because some of the forgers' labour is going unpaid, at least in terms of wheat. Accordingly, there would be a movement of labourers from the forge to the farm unless the ratios of wheat consumed between the two sectors change. Were that to be the case, the farmers would have to give up some of their wheat. As a result, the farmers would grow thin as they would now be consuming less wheat than the ½ ton p.a. needed to sustain them while the forgers would grow fat.

So even when only two products are treated as things rather than as products of labour whose exchange value should be governed by labour time, we see what foolish conclusions can be drawn. The fact is this. The technical relationship between objects, in this case the requirement for twenty tons of iron tools to produce 440 tons of wheat tells us nothing about the distribution of labour time between these two sectors, and it is done purposefully, for the intention of this pamphlet is to remove and replace abstract value from and in the world of commodity production.

There is only one condition that could sustain Sraffa's example and that is the absence of a division of labour. The population of workers are not divided between forgers and farmers. In Spring and summer they are farmers, and out of season, they are forgers. The same labour alternates between farming and forging voiding any consideration as to differences in productivity. But this could not be allowed because in this case there is no exchange relation between these two spheres of production merely

the alternation of labour. In any case Sraffa describes the market following the harvest where the exchange between wheat and tools takes place annually.

His second example, where he introduces pigs, makes even less sense in the real world when viewed from the vantage of labour time. (Henceforth we will dispense with seed crops, consumed iron, and pig infant mortality.) Yes, the population does not have to consume so much wheat when they can add pork to it, so that the individual consumption of wheat declines. Looking more closely Sraffa states that 5 units of wheat = 1 pig and as there are now 60 pigs, this is equal to 300 units of wheat. With 450 units of wheat now being produced that adds up to 750 units of wheat compared to just 400 in the earlier example. Does this mean there are now 1500 members of the community compared to the 800 before, or has their standard of living gone up by the inclusion of pork? In other words, we could be talking of a total labour force of anything up to 750. We are clueless. But we must assume that because the conditions are held constant that there is an increase in labourers.

It gets even more confusing. Take the production of iron. Before 120 units of wheat allowed 20 tons of iron to be produced, including the 8 tons consumed internally. Now an equivalent of 150 units of wheat (90 tons of wheat plus 12 pigs) yields only 21 tons of iron. In other words, an 25% increase in input yields only a 5% increase in output, not very efficient. So here we may have a reduction in productivity. Or perhaps we could have the same number of workers who now produce 5% more iron but go on to enjoy 25% more calories. We don't know either way.

In the production of iron, iron is consumed (tools and forges for example wear out). But now it takes 2 tons less consumed iron to produce 1 ton more iron, ensuring iron is being produced more efficiently in terms of iron. (6 tons down from 8 tons producing 21 tons up from 20 tons). So either the pork fat has gone to the brains of the forgers allowing them to think up better ways of producing tools or perhaps they are using some of this pork fat to lubricate their tools so reducing friction and therefore wasted iron. We are clueless. Whatever the case it is not logical. All we know from the physical world laid out by Sraffa, is that more calories but less iron was consumed producing the new iron. However if we assume a certain calorific consumption per head, then clearly we could work out changes to the aliquot share of labour time.

It gets worse. Total personal consumption is now 450 tons of wheat and 60 pigs annually (ignoring the 21 tons of iron). If we adjust using Sraffa's own proportions of 5 tons of wheat to 1 pig, as previously stated we arrive at the equivalent of 750 tons of wheat equivalent entering into consumption compared to 960 tons of wheat equivalent produced when we reintroduce the iron used up. We could also surmise that pork is substituted for wheat in fixed proportions except that it is not. If we compare the forgers to the farmers, they consume relatively more pork than the farmers. Does this imply they have a higher status than mere farmers? Not really because the biggest consumers of pork are the pig farmers themselves.

The only conclusion to be drawn is this. Since the introduction of pork, and therefore the possibility of triangulation, it can clearly be seen that 'wages' measured by wheat consumption are not proportionate, something we could not discern with only two products. Wages so to speak, measured in wheat equivalents based on exchange ratios set by Sraffa: 10 tons wheat = 1 ton iron = 2 pigs, in turn translates into wheat equivalents 450 wheat + 210 wheat (iron) + 300 wheat (pigs) = 960. In the table below, columns (2), (3) & (4) are the consumption figures, while column 5 is the production figures for each group of producer. Column (6) is the ratio of consumption to production in terms of wheat.

**Table 1. Productivity vs Consumption.**

| PRODUCER | WHEAT | PIGS (wheat equivalent) | Total consumed | Produced | RATIO (4)/(5) |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| Farmer | 240 | +90 | =330 | 450 | 330/450=73% |
| Forger | 90 | +60 | =150 | 210 | 150/210=71% |
| Pig farmer | 120 | +150 | =270 | 300 | 270/300=90% |
| **TOTAL** | **450** | **+300** | **=750** | **960** | **750/960=78%** |

It is clear there are new wage differentials. The new labour aristocracy are the pig farmers who consume 90% of their output compared to around 70% for the rest. What we have here is a wage differential based on differential consumption of pigs. If we assume that pigs exchange for wheat in proportions needed for sustenance, so that each labourer ingests sufficient calories, and we assume the population is now up to 1500, then clearly the pig farmers would be over nourished and everyone else undernourished. The production of commodities by commodities over the heads of the producers would end up causing severe damage to parts of this primitive community. But never mind how the maths works out, what would happen instead is that the wheat farmers and the tool makers would all become pig farmers rendering the maths irrelevant.

**Chapter 2 and the introduction of a surplus.**

Next we turn to Chapter ii, which includes for the first time a surplus. Let us give Sraffa the benefit of the doubt. Let us assume the surplus is not the result of magic but an exceptional year for agriculture just as in the case of the USA in 2014, when the sun shone, the rain fell, and the wind was subdued. All ideal growing conditions. As a result, the output of wheat using the same inputs increased from 400 tons to 575 (Sraffa's figures). So far so good. The result was a surplus of 175 tons of wheat which in turn was exchanged for only 15 tons of tools and not 20 tons. In other words, measured by iron wheat has depreciated, whereas measured by wheat, iron had appreciated. This is the only condition that allows for some of the additional wheat to find itself being redistributed back to the forgers to allow both to share in the good fortune of nature. This alteration in exchange rates allows each sphere to show a surplus which results in a rate of profit of 25% in both.

The rate of profit however is irrelevant because we are not dealing with classes. This is and remains a society based on labourers whose only concern would be an alteration in exchange rates in order to retain the tradition or convention where output is exchanged for output. The farmers could very well keep the extra wheat for themselves, though this is likely to result in the forger's pounding ploughshares into swords. There is no such thing as examples outside history.

The real issue though is whether this surplus is consumed productively or unproductively. If the community decides to exchange it with adjacent communities for wine against pork or wheat, then undoubtedly their evenings would be improved (kebabs, wine and bread as opposed to bread yet again) but the conditions of production, their daytime jobs, would be unaltered.

Now consider the alternative if the surplus is invested. The wheat is converted into more labour time through the hiring of labourers. We now have the emergence of employers and classes. As a result, there will be a proportionate increase in iron and wheat the following year. Now here is the rub. Let us assume that next year the freakishly good weather reverts back to normal. Now it may be the case that maintaining the production of 575 tons of wheat depends on the expenditure of additional labour time not favourable weather. There is thus a reduction in productivity. The rise in the number of mouths to feed now extinguishes the surplus.

The point that is being made is that Sraffa cannot simply conjure up 175 tons of extra wheat without accounting for its increase. On the one hand its increase is due to freakishly good weather, on the other hand its increase is due to more labourers: on the one hand 575 tons of wheat yielded a surplus and on the other it yielded no surplus. But mark, 575 tons of wheat = 575 tons of wheat but the old social conditions do not equal the new conditions. It is likely the new labourers would be sent packing, for while they require supervision, they no longer produce surplus labour because the production of wheat has fallen from 575 tons. As a result, should the weather revert back to normal, it is likely that the production of wheat will revert back to 400 tons the following year and we would be back to square one.

So we can see figures that have no attachment to reality, are just that, figures, and the fact they can be balanced and accounted for, does not render them anything other than figures. In Sraffa's world, we do not have productive labour but productive figures. What Sraffa is engaged in is a forced abstraction. A forced abstraction means a detachment from the reality it is trying to describe. 575 tons can describe better weather or more labourers, a surplus or no surplus.

A real abstraction on the other hand is a simplification of existing reality be it social or natural. Marx's abstract labour is a real abstraction anchored in pre-existing social conditions. When the community divided between forgers and farmers, they would have done so on the basis of both the technical requirements required to produce wheat, a trial-and-error process, as well as measuring their respective expenditures of labour time. On the basis that it required 20 tons of iron to produce 440 tons of wheat, and recognising the production of iron took proportionately more time, it is likely the farmers would have helped out around the furnaces alongside the forgers for part of the time.

We saw in our first example of the forger and the farmer that the technical relationship between iron production and wheat production imagined by Sraffa, would have yielded unequal amounts of labour being exchanged and influenced disproportionate consumption. Hence the exchange relationship between wheat and iron in fact should have been adjusted. But of course if you are conjuring up figures this does not matter, and had Sraffa realised how sloppy his figures were, he could have arrived at a different ratio to the one he set at 12:120 thereby bringing symmetry to all the relations, but that would have negated the whole purpose of what he was trying to do, which was to strip labour time from his calculations.

Hence what Sraffa has introduced with his forced abstraction is an impossibility. His plucking of figures from thin air has produced an incongruity between technical relationships and productive relationships. It is not commodities that produce commodities, it is labour that produces all commodities by modifying original forms and any abstraction has to proceed from that starting point. Labour is common to all commodities, it makes them commensurate, and it is labour time which determines the proportions in which they exchange even in a simplified world. Any other approach, which we may deem to be forced, allows no return back to reality, which is always and everywhere, the complex whole. Sraffa is not a political economist; he is as William Jefferies has written elsewhere - a magician. [(5)]

Finally, Sraffa belongs to the world of material balances, planning devoid of its social essence. In reality it was piece-rate planning, the most primitive form of planning. What is surprising, is not that the USSR collapsed, but that it took so long to do so. Any productive system which does not economise on labour time has no future, simply because it ends up squandering labour.

What is equally surprising is that Sraffa has endured in the way he has, even outlasting the USSR. That he continues to be referenced and written about today, that it is assumed he offers an insight into the

workings of the economy, speaks to the shallowness and vulgarity of academia. In many ways modern economists have become priest-like, using mathematics rather than Latin to both obscure and describe a world which does not exist. Sraffa is emblematic of this approach.

The renaissance of Marxism requires the setting aside of Sraffa and his legacy. He has no place in the Marxist Lexicon. His methodology and politics is fundamentally anti-working class.

Bibliography.


(1) Karl Marx, Volume 1, Chapter 1, Section 4.

(2) Karl Marx, Volume 1, Chapter 1, Section 1.

(3) National Bureau of Economic Research, Wheat Crop, Yield Per Acre for United States [A0137GUSA254NNBR], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/A0137GUSA254NNBR, May 2, 2022.

(4) Karl Marx, Volume 1, Chapter 1, Section 1.

(5) William Jeffries. Piero Sraffa's physical price system and reproduction without production. Capital & Class 00:1-21, June 2019.