HARMONISING THE TRANSFORMATION OF PRICES WITH REPRODUCTION, or making Marx's *Labour Theory of Value* bullet-proof.

There are three approaches to the transforming of market values into prices of production. The first - it does not need to be done, the second - it cannot be done, and finally and most importantly - it can and must be done. The third option is the only one that advances Marx's method.

This article is the culmination of a chain of events. The first event was William Jefferies sending me his latest piece on the transformation problem. (It can be found at the end of the article, link 1) I then forwarded the article to Michael Roberts in the event he had not come across it. In turn Michael sent me the book in draft form written by Peter Jones, I presume in the hope of winning me over to the TSSI method which he knows I do not subscribe to. (Follow link 2 to obtain my critique of the TSSI.) To obtain this worthwhile and thought provoking, if over baked book, follow link (3) I then wrote a critique of Mr. Jefferies article which is attached to this posting as an addendum though modified from the first version.

In my initial response I express my concern about those theorists such as Fred Mosely who hold that as commodities have already been priced in aggregate, all that has to be done in Volume 3, is the redistribution of surplus value already in its price form to yield prices of production. Similarly, the TSSI method begins with prices because input prices in T^0, are taken as priced. To his credit William Jefferies approach is historical, he describes the convulsed movement from market prices being determined by market values, to being determined by prices of production. He quotes approvingly the work done by Pavel Maksakovsky in the 1920s in the USSR which mirrors a neglected section in the Grundrisse itself which Mr. Jefferies brings to light, where Marx first discussed the disruption between market values and market prices of production. For Mr. Jefferies, the decisive change in the two forms of pricing was brought about by the industrial revolution which transformed the technical composition of capital and hence made necessary, prices of production. It goes without saying that Mr. Jefferies dismissed my critique outright.

I have also included a piece by David Jaffe on the Transformation Problem. I considered Mr. Jaffe to be the outstanding Marxist theorist of the 1970s and I considered him a mentor. (Follow link 4). This article is useful because it gives a background to the debate beginning with the criticisms levelled by Eugen Ritter von Böhm-Bawerk, then Ladislaus Bortkiewicz' solution and finally Paul Sweezy against Chapter 9.

The problem with Jaffe's article is that he does not provide a solution as much as a critique of Bortkiewicz and Sweezy's solutions and the assumptions/methods underlying their approach. This is all very well and good. But if we are to get from point A to point B, it does not help to simply point to the flaws in Ricardian maps which lead only into the swamp. Instead, what is required is a map providing the actual route that avoids the swamps and gets us to point B. Where to go and where not to go, are quite distinct.

This is what this article seeks to do. It focuses on the reproduction schema found in Volume 2 of Das Kapital, the volume which breathed life into the modern System of National Accounts. Hitherto it was assumed that when the reproduction schema is used, the transformation of values into prices breaks down, because either, total values no longer correlate to total prices, nor surplus value to profits. We shall see this is not the case in this article and there will be a revelation not seen before. Finally, being able to harmonise the reproduction schema with the conversion of market values into prices of production requires that the distribution of surplus value between capitals be eventually split into two streams, one to price capital and one to adjust profits so they yield an equal rate of profit on these newly price capitals.

The price modelling of simple reproduction.

The economy is divided into three departments. Department 1 produces means of production. Department 2 produces articles of consumption for workers. Department 3 produces articles of consumption for our tormentors the capitalist class. (We are unconcerned about the nature of articles of consumption as use values except to note that the articles consumed by workers are necessary for life as opposed to the articles consumed by the exploiters which are necessary for their amusement and entertainment.)

The social output per period of production amounts to 900. Total capital equals 600 comprising 300 c (column b) and 300 v (column (c)). The total capital which needs to be reproduced in each period amounts to 600 leaving a surplus amounting to 300 (column (d)). In all cases each capital measured by value is the of the same size while exploitation at 100% is common to all capitals. All that differs is the composition of capital unique to each Department. In this we follow Marx's approach with capitals of equal magnitude and equivalent rates of exploitation. We also note via the colour coding the inputs and outputs between Departments and that they balance.

Finally, the surplus of 300 against 600 in capital yields a rate of profit of 50% in aggregate, though the differences in composition yield unequal individual rates of profit. These differing rates of profit need to be harmonised, which is done in Table 2. In column (g) we find that in order to equalise the rate of profit at 50% throughout, 75 of surplus value needs to be redistributed between the Departments.

Table 1. (All at market values)

Dept.	constant	variable	surplus v	output	rates	difference
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	200	50	50	300	20%	+30.0% (+75)*
2	60	120	120	300	67%	-19.0% (-30)
3	40	130	130	300	76%	-24.0% (-45)
Input>	300 +	300 =600	+ 300	=900	**50.0% (average rate)**	*Rounding off

In Table 2 below, column (f) the redistributed surplus value is added or subtracted from the original quanta of surplus value to yield an average rate of profit of 50%. When this equalised profit is added to the existing capital measured as values, we obtain a different output quanta per Department which Marx termed "commodity price" and which is an amalgam of value and partial price.

Table 2. (A hybrid of existing values and emerging prices.)

Dept.	constant	variable	surplus v	total	Adjusted p	Rate of profit	Commodity price*
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(b + c) + (f)
1	200	50	50	300	50 + 75 = 125	50%	250 + 125 = 375
2	60	120	120	300	120 – 30 = 90	50%	180 + 90 = 270
3	40	130	130	300	130 – 45 = 85	50%	170 + 85 = 255
	300	**300**	**300**	**900**	**=300 profit**	**50%**	**600 + 300 = 900**

(*Table 2 is as far as Chapter 9 in Das Kapital goes.)

However, we need to proceed further. We need to ensure that all commodities are fully priced and that the outputs and inputs between the Departments once priced continue to balance, thereby ensuring production is not torn apart by disproportion.

To do this a further 75 of surplus value now needs to be redistributed mirroring the first distribution confined to revenue, firstly to reprice capital and secondly to adjust profits to yield an average rate of profit on the newly repriced capital. From our observations we note capital is 2/3 of the social output while surplus revenue is 1/3. Therefore 50, being 2/3, is directed at repricing capital leaving 25 to adjust profits. I believe this splitting of the surplus value to be the key which unlocks the whole puzzle, and which has not been previously adopted, including by Marx.

Table 3. (Approaching price lift-off)

	Total C	Adjustment	Repriced capital	original profit	adjustment	Adjusted profit
1	250	+ 50	= 300	125	+25	150 (50%)
2	180	- 26	= 154	90	-13	77 (50%)
3	170	-24	= 146	85	-12	73 (50%)
	600	**0**	**600**	**300**	**+25 – 25 = 0**	**300 (50%)**

*Rounding off error

We now have capital in its initial price form and profit in its adjusted price form. Or put another way we have cost prices for all the Departments, which when a profit margin of 50% is added, this yields priced output. This is found in Table 4. We note the total deviations between price and value amounts to 150 or 75 x 2. The price of output at this time remains aggregated, for example the $450 in Dept 1 represents the total price of its output. We now need to reduce the aggregated price of output to individual prices of production, the prices at which commodities circulate, and which are their governing prices. The reason for this will be apparent soon.

We assume that Department 1 produces 300 means of production whose original value was 1 when measured by labour time. Department 2 produces 300 units of article of consumption valuing each one at 1 while Department 3 produces 300 items valuing each one at 1. In the table below we reprice them according to the total price of output found in Column (d) divided by volume in (e).

Table 4. (Almost there, distilling individual prices.)

Dept	Repriced capital	Adjusted profit	Price of output	Average unit price
(a)	(b)	(c)	(d)	(e)
1	$300	$150	$450	$450/300 = **$1.50** each
2	$154	$77	$231	$231/300 = **77** cents
3	$146	$73	$219	$219/300 = **73 cents**
Inputs>	$600	$300	$900	

(Adjusted profits for Dept 2 and 3 have been rounded off avoiding the 0.5 tails.)

To begin, alarm bells. We note that inputs and outputs no longer balance - columns (b), (c) & (d). $600 vs $681 (or $450c + $231v) in capital and $300 vs $219 in profit. These disproportions, if maintained would undoubtedly collapse reproduction. This is the point when many Marxists' studying this anomaly threw in the towel or alternatively sought refuge in their maths. They should not have. We return to unit prices.

These are the average unit prices of production or market prices which exit each department preparatory to being bought and consumed. Once they are bought and applied as inputs they change both the cost price and profit in each Department. This is the amount of money that will flow between the departments.

If we assume that Department 1 produces 300 means of production every period, each one will be priced at $1.50. It follows that if Department 1 consumes 200 units as its means of production, its total c will rise to $300. (These physical numbers were determined by labour time in Table 1 or 200, 60 & 40.) Similarly, within Dept 2, its 60 is converted into $90c while in Department 3 its 40 units are bought for $60c. These figures can be found in Table 5 below under **c.**

Next, we turn to variable capital. Now, instead of appreciating as in the case of constant capital, variable capital depreciates. The average price of a workers' good falls from $1 to 77 cents. The price of labour power which has fallen by one third as a result, now stands below its value. Thus, total variable capital reduces from 300 to $231. Once again that can be seen in Table 5 below.

Finally, regarding the articles of consumption found in Dept 3, there too we find a fall in unit prices of 27% reducing its price of output from 300 to $219 because the 300 items are now bought for 73 cents rather than $1.00.

Table 5. (Arrived! Priced outputs have become inputs.)

Dept	c +	v	= C	+ p	= Prices of Production*	Rate of profit
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	300	39	339	110	$450	32%
2	90	92	182	56	$238* (+6)	31%
3	60	100	160	53	$212* (-6)	33%
inputs	$450	$231	$681	$219	$900	Average 32.2%
			600 + 81 = $681	300 − 81 = $219		

(* rounded off)

Now it is important to note that physically nothing has changed. 100 items of constant capital circulate as before. Workers may be receiving reduced wages, but this is compensated for by a proportionate fall in the prices of the items found in their wage basket. They consume the same number of items as before. Likewise, the capitalists may have a reduced sum of profits but again what 300 bought before, $219 now buys.

However, there appears to be a minor problem. Inputs and output are marginally out of alignment. There seems to be a discrepancy of 6, and it is coming from the disparity found in Dept 2 and 3. The answer why will be found in the next section.

Proof of concept.

Theoretically, $75 should have been added to capital and $75 deducted from profit, half the total redistribution of $150, not the $81 found above. This would have yielded $675 in capital and $225 in profit. As a result, the input side formed of 450c, $231v and 219s, would have become 450c, 225v and 225s balancing the output side.

The origin of this discrepancy can be tracked all the way back to Table 2 where profits were adjusted to achieve a consistent rate of profit of 50% in each Department. This meant proportionately more surplus

value was transferred from Department 3 because it had the lower composition than Department 2. If we factor for this discrepancy, we find the missing 6. In that case Table 2 would have looked like this.

Table 2 revised.

Dept.	constant	variable	surplus value	total	Rate of profit	New Rate of profit	Original Commodity price*	Revised Commodity Price
1	200	50	50	300	50 + 75 = **125**	50%	375	250 + 125 = 375 **(0)**
2	60	120	120	300	120 – 36 = **84**	47%	270	180 + 84 = 264 **(-6)**
3	40	130	130	300	130 – 39 = **91**	53%	255	170 + 91 = 261 **(+6)**
	300	**300**	**300**	**900**	**=300 profit**	**50%**	**600 + 300 = 900**	**900**

(Capital 2. 120/250 x 75 = 36. Capital 3. 130/250 x 75 = 39.)

Thus, we find the discrepancy of 6 (final column of the table immediately above). Its origin lay in the need to achieve a uniform rate of profit using only the surplus value element rather than total value. That is the only reason why capital ended up appreciating by $81 rather than $75. Had we transferred surplus value on the basis of the size of capitals then the output of both Dept 2 and 3 would have to be adjusted by 12 (+6 and -6 on either side). In that case, Table 5 (revised) below, would have looked like this; a symmetry between inputs and outputs safeguarding reproduction, and precipitating rates of profits which are proximate rather than identical but close enough together to discourage the movement of capital. As Marx and Engels remarked, in real life rates of profit are unlikely to be identical.

Table 5 (Revised.)

Dept	c +	v	= C	+ p	= Prices of Production	Rate of profit
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	300	36	336*	114	$450	33.9%
2	90	80	170	56	$225*	32.9%
3	60	109	169	55	$225*	32.5%
inputs	$450	$225	$675*	$225*	$900	Average 33.3%
			600 + 75= 675	300 – 75 = 225		

(*rounded off)

(Working notes: 12 needs to be deducted from 92v in Dept 2 (Table 5) yielding 80 in order to be re-distributed. In Dept 1 v needs to be depreciated as well. The number here is 3 reducing 39v to 36v. Proportionately 9 is added 100v in Dept 3 bringing it up to 109v. (That figure is +-8% or 18/225, the 18 representing the 12 adjustments to **C** and as we shall see, the 6 to s.) The result is that **C** is now proximate in Dept 2 & 3 at 170 and 169 respectively. This however leaves a balance of 6 (-12 - 3 + 9) This 6 is then moved over to adjust profits raising it from 219 to 225. This is done by adding 4 to Dept 1 (110 + 4= 114) and 2 to Dept (53 + 2 = 55), once again proportionately. All figures have been rounded off so as to make the correlations easier to see. The final result is a rate of profit that deviates by no more than 0.8%. Of course, this is a mathematical representation of the unconscious process competition executes.)

Or to avoid this trap we can use the entirety of the transfer amounting to 150 in one step rather than two. In which case we arrive at the revised Table 5 above. When we invoke a one-step solution + 150 is transferred to Department 1 while 75 each is deducted from Departments 2 & 3. This yields individual market prices of 150 cents for Dept 1 and 75 cents for both Departments 2 & 3. As a result, the reproduced prices remain unaltered no matter how much we reproduce the cycles. The rates of profit vary in the same proportion as found in Table 5 (revised) In terms of the average rate of profit of 33.3%, the alignment of Dept 1 is within 2%, Dept 2 is within 2% while 3 is within 2.5%, close enough. In reality competition merges rates of profit rather than making them identical.

It is important to arrive at 450c + 225v +225s because this demonstrates why the total distribution had to be $150 and not say 200 or 120. The end result is a redistribution of $75 from profit to capital leaving a redistribution of $75 within profit itself which corresponds to the first redistribution found in Table 2, which yielded profits of 125, 90 and 85 respectively.

In the case of the Tables found in Chapter 9 itself. The total distribution would have been 26 + 26 = 52 and not 26. Total capital valued originally at 500 would have been repriced at 521 ($^{500}/_{610}$ x 26) while total profits would have been priced at 79. Ah ha will say the purists amongst us, the rate of profit has fallen in both cases. In our example it has fallen from 50% to around 32% and in Chapter 9 from 22% to 17% (89/521). One of the invariants has been violated, i.e. total surplus value and total profits no longer equate. Money profits in the tables above are now $225 whereas formerly they were 300 measured in terms of value. In fact, it may be the case, that with hundreds of sectors, the difference between the rate of profit measured by price and that measured by value would be reduced precisely because of the number of sectors.

But are the capitalists poorer for this? Returning to our example, originally, they had 600 in capital and 300 in profit. Now they are $75 richer in capital which is priced at $675. True their profit has fallen by $75, but if you asked the capitalist whether they would prefer $450 in constant capital plus $225 in profit making $675 in unpaid wealth compared to the previous 300 in constant capital plus 300 in surplus value making up only 600, you would be hard pressed to obtain a definitive answer. Actually, the answer is moot because the capitalist class never encounters value, only prices.

In fact, it is the working class who are worse off. Previously, they were paid for one third of the labour they produced (300/900) but currently they are being paid for only a quarter ($225/$900). If we used the 'rate of unpaid labour' it would have risen from 3 (900/300) to 4 (900/225) as paid labour is now a smaller share of the social product. When products of labour circulate as products of capital and are priced accordingly, workers always lose out. While profits no longer correspond to the mass of surplus value because part of that surplus value has been used to reprice capital, the rate of profit remains tightly grouped around the new average (rounding off errors aside).

The latter is the more critical test. In fact, we would be wise not to dismiss the observation that the rate of profit measured by prices will tend to reside below the rate measured by values. The rising composition of capital necessarily leads to an appreciation of constant capital and a depreciation of labour power in terms of money. It does stretch the elasticity between values and prices, and here Mr. Jefferies has a point, this is most unlikely to be a smooth process.

To demonstrate this point we need look no further than the ratio of variable capital to constant capital (fixed means plus inventories) found in US manufacturing. Here the ratio of living to past labour is between

20 and 25 depending on year. Thus, when measured by a single period of production, not annually, living labour is setting in motion at least 20 times more dead labour (and the ratio would be much more if we add back cumulative depreciation which has reduced the aggregate price of this dead labour.) This is difficult to explain unless a rising composition of capital is also shifting relative prices in favour of constant capital. This could result in a reduction in the rate of profit because constant capital towers over variable, even though over time, constant capital is being cheapened in terms of labour time.

In conclusion, let us be clear, one key step made this article possible - the splitting of the second stream of surplus value into two, one directed at repricing capital the other at adjusting profits without which no averaging out of the rate of profit on the newly repriced profit was possible. (follow link 5) (Note 1.) Without that additional step first proposed in my Transformation Solution, Table 5 would have had no symmetry, and the inescapable conclusion would have been that Mr. Jefferies was right.

For my part I have sought to use Marx's methodologies and extend them to their conclusions. The reader will note I adopt the same tables and methods as Marx because they are the most illuminating. What distinguishes us is that this article doubles the amount of surplus value needing to be redistributed, and by splitting the second stream between capital and profits, it creates the process whereby surplus value is redistributed not only between profits, but between profits and capital, thereby pricing both. By extending, if not adding to Marx's original assumptions, proofs have been obtained and consequently, a map has been drawn to safely guide us through the swamp allowing us to leave behind the snagging legacy of Eugen Ritter von Böhm-Bawerk, Ladislaus Bortkiewicz and Paul Sweezy.

It is time to say goodbye to both the "can't do it" and the "don't need to do it" members of our Marxist community. What was avoided has now been conquered at a time when an increasing unstable capitalist world is crying out for and deserving answers. In the clash of ideas, one law will be at the fury's centre - the law of value - and if we cannot show how it connects to price, and therefore reveals exploitation, all will be lost.

Addendum (Critique of William Jefferies Published Paper.)

Having collaborated with William Jefferies years ago his paper is anticipated. Mr. Jefferies always felt that the transformation problem could not be solved because of the incongruities found in real life, and as he says, Marx's discontinuity found in the tables presented in Chapter 9 reflects actual disruptive processes characteristic of a turbulent mode of production.

Mr. Jefferies places the emphasis on the industrial revolution which tears prices and values apart because it rapidly escalates a rise in the composition of capital. This rising composition of capital which in turn intensifies the differentiation between industries requires a shift from market prices being determined within an industry to market prices being determined between industries whose numbers are multiplying exponentially. I presume he is making more concrete the observation made by Marx in Chapter 10 of Volume 3 that prices of production replace market values only at a higher stage of capitalist production.

While not disputing the importance of the industrial revolution, the observation that it was the sole cause of the disruption is incomplete. For prices of production to assert themselves, also presumes capital has become mobile, able to navigate its way between industries with the minimum of friction. Prices of production are a product of the movement of this mobile capital which by altering the relationship between demand and supply precipitates the specific form of competition needed to yield prices of

production. Mr. Jefferies seems to confuse this specific form of competition, from that found within an industry itself, where the market price directly distributes surplus value between the producers who populate that industry and who differ in their productivity. "*The contradiction is solved as the growth of fixed capital and competition means that more efficient capitals with a higher organic composition of capital will capture the profits from their less efficient competitors.*" It is by focusing on the specific nature of the competition between industries that two further considerations need to apply. Firstly, capital needs to become social as Marx identifies in Volume 3 so that it has no emotional attachments to its origin say in the case of a family firm, which is why the better term would be; capital which has become impersonal and at the disposal of managers, and secondly it requires a developed credit system. The laws which make capital impersonal under the heading of Company Law, succeeds not precedes the industrial revolution. Only in the 1840s are the first modern Company Laws systematized and written up. (The importance of this mobility continues to today. Lack of mobility is found in China and was found in Japan at the end of the 1980s which obstructed and will obstruct the necessary restructuring of capital needed to open the way for expanded future profitable production. It was the ruthless ability of US capital, already internationalized by the end of the War, to restructure and prune itself, which led to US corporations roaring back in the 1990s.)

To substantiate his point Mr. Jefferies claims that it was only because of the industrial revolution that England's first crisis of overproduction took place in 1825. Strictly speaking it was the first crisis sparked by an overproduction of <u>industrial</u> goods. Crisis of overproduction of <u>agricultural</u> goods involving England occurred as early as 1703 with the American Tobacco crisis. (There were a further 10 serious cases of overproduction which impacted Britain before 1825.)

In both cases, there was an overproduction of commodities and capital though their use values differed. I make this point to clarify an issue. Overproduction of any commodity be it agrarian or industrial presumes a market no longer dominated by simple commodity production, but one of generalised commodity production. Mr. Jefferies alludes to this when he describes the period preceding the industrial revolution as one of manufactory. Clearly large-scale cigarette manufacturing found in the 18th century was manufactory. But here is the rub and I am not referring to a stage of cigarette manufacturing, this was a period in which market values dominated not prices of production. So even here, at a lower order, there was discontinuity and disproportion. In fact, capitalism exits the womb malformed.

Mr. Jefferies embarks on two worthwhile pieces of archaeology. Firstly, he draws our attention to a neglected section in the Grundrisse substantiating his position. For my part I am more concerned with the concluding part of Volume 3 where Marx's emphasis on this question has shifted. And he unearths the work of Pavel Maksakovsky, one of the notable Red Professors going back to the 1920s in the USSR. Pavel Maksakovsky had a position very close to Mr. Jefferies. In fact, it is surprising how far Pavel Maksakovsky is willing to go to describe the extreme limits of this discontinuity. Mr. Jefferies quotes approvingly "*The production of means of production anticipates the production of means of consumption. The '"proportionality" of social reproduction' is disrupted as 'prices that become detached from prices of production – or values' so that 'the period of expansion is also the period in which overproduction matures and becomes apparent in the market."* (page 16). Later Maksakovsky will go on to speak about values and prices becoming detached once more in the recessionary phase as prices are crushed by the paralysis of capital and detached from value in the opposite direction. A better expression would not be to use the word "detached" but rather the extreme limit to which value and price can diverge depending on the specific conditions found. The importance of this observation will become clear shortly.

However, far from the law of value being suspended at this juncture, it is working overtime. At this time the relative fall in the rate of profit accelerates despite inflation, and by disrupting investment it begins to decelerate turnover, which in turn converts a relative fall into an absolute fall in the rate of profit, the trigger for all recessions. A somewhat more complex picture and chain of events than the one presented by Mr. Jefferies and Maksakovsky which is limited to the price form.

What distinguishes and distinguishes Mr. Jefferies approach and mine was the issue of regulation. While Mr. Jefferies subscribes to the section in the Grundrisse he quotes, I incline towards the most developed Marx, the one who wrote the concluding section to Volume 3 after decades of reflection. This is what Marx says in Chapter 50 of Volume 3, titled: The Illusion Created by Competition. "*Market prices rise above these governing production prices or fall below them, but these fluctuations balance each other out. If one compiles price lists over a prolonged period, and ignores those cases…it is surprising how narrow the limits of these divergences are and how regularly they are balanced out.*" (Page 1000 of the Penguin Edition) Further, throughout Volume 3 Marx observes how it is the average industries which act as the center of gravity preventing the outlier industries, i.e. the ones with the most extreme compositions on either side, from moving too far apart.

This is not an academic discussion around pricing. We have to account for the fact that capitalism still suffocates us 200 years after the first industrial crisis in 1825. And why it did not collapse like the USSR within 60 years of the inception of the First Five Year Plan. The reason is clear, unlike capitalism, the USSR did have a truly disruptive and unregulated pricing system.

What Marx was trying to do in Chapter 9 was to reconcile prices of production with market values. His purpose; to show that the resulting deviations were range bound. There were outer limits beyond which prices could not deviate from values without destroying the system. In Marx's closed system based on five capitals at market values, he shows the **direction** in which surplus value needs to flow and **by how much**. In his example it is 26, not 24, 28 or 30, but 26. This sets the absolute limit to the collective and therefore individual deviations.

In short despite the chaos, there are hidden laws operating which govern these movements though never in real time and always through mediation. And if there is regulation then mathematical modeling is possible provided the correct assumptions drive it. And here Mr. Jefferies makes his final mistake. He confuses modelling with the real world. Modelling must pass the test that it can demonstrate workable relations and or processes, in short define structure. That its assumptions cannot be disproved. If it survives this test the links formed are real. This is what I have set out to do and what Marx did in the first parts of Das Kapital with his modelling.

I sometimes feel ashamed of the field of Marxism. In the world of capitalism there are found scientists, mathematicians and programmers who can devise algorithms which map complicated processes such as a nuclear explosion, global weather and the fluid dynamics found in the core of a supersonic jet engine. But it appears we cannot model the link between values and price. I use the term complicated with precision. Only complicated processes can be modelled, and capitalism is a complicated system not a complex system. If it was complex in the mathematical sense, it would be evolving into something new which it is not. Capitalism changes, but without changing its fundamental laws, it simply becomes more complicated.

So, it is possible to model these links as I did in the article on the Transformation Problem and the processes found in my articles. This forms a proof, which is bound to be simpler than real life, though who knows it may be possible to use a supercomputer to one day iron out all the complications found, but that is beside the point. The criticism of Chapter 9 arose not because Marx incongruity is real, but because his example stopped short of resolving this incongruity.

My final criticism comes with a tinge of sadness. Only once does Mr. Jefferies use the term market value and then only in the context of a quote. And yet together we examined this concept in detail all those years ago. As a result of this collaboration, Mr. Jefferies' first published book based on his dissertation, contained the immortal and previously unuttered words 'only the weighted average labour time can yield a value which when multiplied by the number of products produced and sold, captures the total labour time expended on its production. The simple average will not unless it coincides with the weighted average.' That value is of course market value, and concretely, it is social value or what is the same thing the actual cost of production measured by labour time. It alone incorporates the weight of production carried out by individual firms as well as their individual costs of production. In an industry dominated by the weight of production carried out by lesser productive firms, the market value will rise above the (simple) average value and vice versa if the industry is dominated by the weight of production carried out by the more productive firms or what is the same thing, firms with productivity above the average.

Which is why, unlike Mr. Jefferies, I insist that only market values can be transformed into prices of production. Individual values can only be transformed into market values. Mr. Jefferies knows this, or at least he knew it at the time. Market values as a category is as important as prices of production though the latter has superseded the former. And it is impossible to understand Chapter 9 without having first understood market values and what they represent.

(1) https://www.researchgate.net/publication/354361236_The_Labour_Theory_of_Value_Simple_Commodity_Production_and_the_Transformation_Problem
(2) https://theplanningmotivedotcom.files.wordpress.com/2021/09/tssi-updated.pdf
(3) https://openresearch-repository.anu.edu.au/handle/1885/150582?mode=full
(4) https://www.marxists.org/subject/economy/authors/yaffed/1974/valueandpriceinmarxcapital.htm
(5) https://theplanningmotivedotcom.files.wordpress.com/2021/08/transformation-problem-comprehensive-update.pdf

Note 1. In the comprehensive update to the transformation problem in link 5, the need to double the transfer of surplus value, the first tranche to average out the rate of profit, the second to reprice capital and provide a final adjustment to profits, was not spelled out. Thus, in this article the total transfer is 150 not 75. What was an error of omission in the comprehensive update has now been corrected. Included in the update (5) is a proof why a transfer of only 75 could not realign inputs and outputs.

Brian Green, 11th August 2021 & revised 13th January 2026.