Valuation in the Presence of Stocks of Commodities: Exploring the Temporal Single System Interpretation of Marx.

Introduction.

All too often articles concerning the Temporal Single System Interpretation (TSSI) of Marx are either, fighting for its right to exist or, attempting to eliminate the TSSI as a disturbing virus. As critics of the TSSI outnumber its supporters, most journals insist that articles supporting the TSSI should follow/address the agenda of the TSSI's critics. In contrast, we shall attempt to explore the TSSI. After briefly explaining the TSSI's sequential and non-dualistic nature we shall consider how, within the TSSI, there is a difference between Kliman's (1999) and Freeman's (1996) treatment of valuation of commodities in the presence of stocks of commodities. We conclude that this difference of approach indicates how research informed by the TSSI of Marx is not a matter of following a particular dogma, but rather is an open and exciting route to attempting to apply Marx's analysis of capitalism to understanding the world today.

The Temporal Single System Interpretation of Marx.

The TSSI of Marx abstractly imagines alternating sequential periods of production and circulation, and employs a non-dualistic concept of price and value; see Freeman and Carchedi (1996) page x (their emphasis),

> 'Non-dualistic (unitary, or redistributive) because it considers that prices and values *reciprocally determine* each other in a succession of periods of production and circulation. Prices are not determined independent of values but neither are values determined independently of prices.'

We are no longer in Bortkiewicz's (1952 and 1984) simultaneous and non-dualistic world, values are not simply determined by the technical conditions of production and seen as a separate concept/system to the price system.[1] Capitals, buy inputs for the current period of production, in the preceding period of circulation, at prices established at the end of the preceding period of production; Marx (1976), page 260,

> ‘The value of a commodity is expressed in its price before it enters into circulation, and it is therefore a pre-condition of circulation, not its result.’

These money prices express the socially determined values of inputs for the current production period, and represent the value appropriated/received by the capitals that produced them last period, which may differ from their produced values at the end of production last period. Constant capital and variable capital now enter production with these values; the value expressed by their money price. McGlone and Kliman (1996) page 32 (their emphasis),

> ‘It should be clear that Marx’s embodied labour theory is a theory of abstract, alienated labour. Because the embodiment of abstract, alienated labour is a peculiar social process, not a technological requirement as such, the abstract labour embodied in a commodity need not equal the amount of (concrete) labour needed to (re)produce it. Although exchange does not alter the quantum of value in existence, it does redistribute it. Because abstract labour is redistributed through exchange, some commodities *embody* more abstract labour than they would otherwise, some less. On the basis of this notion of labour embodiment, one can comprehend how the capital advanced to production does not cease to be a sum of value merely because it differs from the value of its material elements (means of production and subsistence).’

Appropriated values and produced values may diverge but, within the overall constraint (Marx, 1981) that, total appropriated value must equal total produced value i.e. the price of total capital must equal the value of total capital. The TSSI thus defines the monetary expression of labour-time (MELT), established at the end of production each period with price formation, as the nominal price/money expression of total capital divided by the total produced value of capital. The MELT relates how many nominal units of money represent one hour of labour-time. We may establish inputs appropriated value, in terms of labour-time, by dividing their nominal price by the MELT holding at the time of their purchase i.e. the MELT established upon price formation at the end of production last period. In succession, we re-calculate MELT at the end of production each period, when that period’s prices are formed, enabling us to express all end-period value magnitudes, produced and appropriated, in either nominal money or labour-time terms.

In summary, hoping to have correctly interpreted the TSSI, at the end of a production period, the value produced by a capital:

A) Depends on the surplus labour-time added in production, and the value of inputs, as defined by their price at the end of the previous period.

B) Will differ (by the tendency to profit rate equalisation) from the value that capital appropriates through price formation.

C) All value magnitudes may be expressed either, in nominal units of money or, labour-time terms, through adjustment by the appropriate MELT for that point in the circuit of capital.

The Difference Over Stocks.

To focus on commodity stocks let us assume the economy has a single sector producing a single commodity with no input other than living labour (L). We have for simplicity abstractly assumed away any constant capital, either circulating or fixed. We assume a stock of our single commodity (U) is carried forward from the last period to the start of our current period. Production now occurs in our current period, producing an output of our single commodity (Q). But what would the unit value in term of labour-time of our single commodity be? Let us first explore Kliman's approach to stock valuation, indeed valuation in general, Kliman (1999) pages 102 to 103,

> 'Marx, however, seems consistently to have argued that, because value is determined by socially necessary rather than actual labor-time, commodities' values, and the value that inputs transfer, are not determined by the original cost of producing them. They are instead determined by the cost of reproducing them currently. This denial of historical cost valuation has been taken as an affirmation of replacement cost valuation. Were these the only possible alternatives, such a conclusion would be valid. Yet a third alternative – which I will argue was Marx's own – does in fact exist. The value transferred from inputs might depend, not on their historical cost, nor on their *post*-production replacement cost, but on their *pre*-production reproduction cost, the cost of reproducing them when they enter into the production process.'

In our simple model we have no input of our single commodity so the above quote would seem unhelpful. But if we assumed stocks of our single commodity did enter production at some time Kliman argues that they would enter at their pre-production reproduction cost. Their pre-production reproduction cost, their unit value in terms of labour-time at the start of the period they are to be applied to, would simply equal the unit value of our commodity as established at the end of the previous period to when they are to be applied. Although the stocks we assume do not enter production we

can not imagine that they cease to have any value because of this. It seems reasonable to assume that we would value stocks at the end of a period at the value they would have if they were to enter production next period (or for that matter exit the system altogether through being consumed by workers or capitalists). When considering Marx's example of a rise in price of cotton (Marx, 1976 pages 317 to 318) Kliman (1999) page 105 states, followed by Kliman (2007) page 21,

> 'it is clear that, because values are determined by current production conditions, when the value transferred to newly produced yarn rises, so must the value transferred to existing stocks of yarn.'
>
> 'The phrase "currently needed to produce" reflects the idea that the value of newly-produced items determines the value of already-existing ones. If wheat harvested last year had a value of $4/bushel, while wheat harvested today has a value of £3/bushel, then any wheat that remains from last year likewise has a value of $3/bushel today.'

For Kliman the unit value in terms of labour-time of our single commodity at the end of production in the current period would equal $v_{current} = L / Q$. Carried forward stocks of our single commodity from the previous/last period would have, $v_{last}U$ value at the start of the current period, to be replaced by $v_{current}U$ value at the end of the current period. If $v_{current} \neq v_{last}$ we can clearly see that stocks have to be re-valued. The total value of current output and carried over stocks from last period at the end of the current period equals $v_{current}Q + v_{current}U$ (as $v_{current}Q = L/Q$, we can simply say $L + v_{current}U$). Potential stock revaluation ensures that the total value of current output and stocks at the end of the current period does not equal the value of stocks at the start of the period plus the living labour applied in production in that period:

$$L + v_{current}U \neq L + v_{past}U, \quad \text{unless } v_{current} = v_{last}$$

However Kliman's method does ensure, is based on the concept that, the value of newly produced commodities is determined by the labour-time actually expended in their production, in our simple model L ($v_{current}Q = L$), and more generally the used up constant capital plus the living labour applied.

Let us now consider Freeman's different treatment of stocks of commodities, Freeman (1996) pages 255 to 256,

> ‘Production begins with a definite quantity of each commodity possessing a definite value. … Total use value is the initial stock less what was consumed plus what was produced; while its exchange value is the initial stock less what was consumed, plus value transferred in production, plus the value product. Dividing the second by the first gives the new market value of the commodity, arising from the two sources of existing stocks and new product. … As before, there is a contradiction between the output and input values of C_I. The 50 units of output have an individual value given, as usual, by the sum of metamorphosed inputs (1400) and value product (300). Their unit individual value is therefore 1700 + 50 = 34. If it were not for the 35 units of preserved stocks of C_I, this would be the market value. But these preserved stocks also contain the value with which they started, namely 1400, corresponding to the old unit value of 40. There is only one coherent way to resolve this contradiction, which is to estimate the new market (social) value of C_I as the average of the whole value contained in the whole stock of C_I:’

In the context of our simple model we now calculate the unit value in terms of labour-time of our single commodity at the end of the current period as:

$$v_{current} = (L + v_{past}U) / (Q + U)$$

We carry the start period value of stocks through to the end of the period to determine, with living labour performed in the current period, the total value of currently produced output and carried over stocks. Our single commodity’s unit value at the end of the current period is simply this total value divided by the number of newly produced units of our single commodity plus carried over stocks of our single commodity from the last period. Treating stocks in this way ensures the total value of stocks and currently produced output at the end of the current period is precisely the living labour applied in that period above the value of stocks at the start of the period:

$$v_{current}(Q + U) = L + v_{past}U$$

However if $v_{current} \neq v_{last}$ the current period’s produced output will not embody the living labour worked in that period:

$$v_{current}Q = [(L + v_{past}U)/(Q + U)]Q \neq L \qquad \text{unless } v_{current} = v_{last},$$

In summary, for our example with no constant capital, following Freeman the total value of newly produced commodities and carried over stocks will rise above the value of carried over stocks at the start of the period by the living labour applied in production in that period or, *but not both if there is technological/productivity change*,

following Kliman the total value of newly produced commodities in a period equals the living labour applied in production in that period. We have a clear difference in Freeman's approach and Kliman's approach to valuation in the presence of stocks.

A More Thorough Example.

To focus on the question of valuing stocks we shall assume a very simple/abstract economy. We assume no fixed capital, and that we have identical capitals producing a single identical commodity. Capitalists carry stocks of our single commodity through periods. We assume stocks do not perish, remaining identical in use-value to new units of output of our single commodity. Strictly speaking capitalists have no reason to trade with each other. To impose the need to exchange commodities in circulation, let us assume capitalists cannot use their own output or stocks for inputs or their own consumption. Although we wish to consider only one complete period, starting with production and ending with instantaneous circulation, the TSSI's sequential nature ensures we must define the situation at the end of the previous period, period t-1, in-order to determine the values of inputs in our current period, period t. Given, Kliman and Freeman's alternative approaches to stock valuation produce different results, if stocks are carried over and productivity changes, we shall assume no stocks are carried over to period t-1 from period t-2. We thus start from a common base, at the end of period t-1 there are no carried over stocks from period t-2 to potentially re-value.

In circulation at the end of period t-1, one part of total output is sold/demanded, and the other part becomes stocks to be carried over to period t. Demand at the end of period t-1 comes from three sources. Firstly, capitalists' purchases of our single commodity for their own consumption. Secondly, capitalists' purchases of our single commodity to apply as constant capital input for period t. Thirdly, through capitalists advancing to workers, at the end of period t-1, their wages for period t, which we assume they entirely spend in circulation at the end of period t-1 i.e. this period's workers consume part of last period's output.

With period t inputs defined production proceeds in period t. The labour-time, agreed in the wage bargain at the end of period t-1, is worked in production in period t.[2] Surplus labour-time equals the difference between total labour-time and paid labour-time/variable capital (as determined by the wage paid at the end of period t-1). At the end of production at t our single commodity has a produced unit value, with total capital equalling the value of newly produced output plus the value of carried over stocks from the end of the previous period. With only one-commodity our commodity can not deviate in appropriated value from produced value, as there is no other commodity to match, and thus facilitate, this deviation. Price formation at the end of production at t will simply ensure appropriated value equals produced value. Demand will now determine how many commodities are exchanged in circulation at the end of period t and the new level of stocks to be carried through to period t+1. Let us explain the notation we shall employ,

C constant capital input at the start of the production period.
D demand in circulation at the end of the period.
K capitalists' personal consumption purchases in circulation at the end of the period.
L labour-power applied in the production period
m the monetary expression of labour-time (MELT) at the end of the production period.
p the price of our single commodity at the end of the production period.
ρ the profit rate at the end of the production period.
Q the output of our single commodity at the end of the production period.
r the rate of exploitation of labour in the production period.
S surplus-value produced by the end of the production period.
U stocks of our single commodity after circulation at the end of the period.
V variable capital input at the start of the production period.
v the unit value of our single commodity at the end of the production period.
Y total capital at the end of the production period.

£ superscript indicates a variables produced value in nominal units of money.
£* superscript indicates a variables appropriated value in nominal units of money.

o superscript indicates a variable is expressed in physical units of our single commodity.

h superscript indicates a variables produced value in terms of labour-time.

h* superscript indicates a variables appropriated value in terms of labour-time.

t subscript marks which period the variable applies to.

For example, $Y^{£*}_t$ represents the monetary expression of the appropriated value of total capital at the end of production at t (conventionally M'_t). Y^{o}_t represents the number of physical units of our commodity that make up total capital at the end of production at t. Y^{h}_t represents the total produced value of capital, measured in terms of labour-time, at the end of production at t. Y^{h*}_t represents the total appropriated value of capital in terms of labour-time at the end of production at t. Note we apply no superscript to MELT (the number of nominal units of money, which represent one hour of labour-time, at the end of production).

Table 1 shows the situation we assume for the end of period t-1. We only set the situation at the end of period t-1 in so far as it affects period t i.e. we do not specify period t-1's surplus-value or profit rate.

Table 1 – End Period t-1.

	End of Production in Period t-1										Circulation at end of Period t-1				
			Value Produced				Value Appropriated				Demand				
Units	p	*m*	Q	U	Y	*v*	Q	U	Y	*v*	C	V	K	U	D+U
o			**27**	**0**	27		27	0	27		**15**	**5**	**2**	5	27
£	**5**	1	135	0	135	5	135	0	135	5	75	25	10	25	135
h			**135**	0	135	5	135	0	135	5	75	25	10	25	135

In Table 1 the nominal price of our single commodity and MELT are positioned under the end of production, before produced and appropriated values, to stress that, by the TSSI, prices and thus MELT are formed at the end of production, at the same time, not after, produced and appropriated values are formed. This allows us to use MELT to determine the monetary expression of produced values, $Q^{£}_{t-1} = m_{t-1}Q^{h}_{t-1}$, $Y^{£}_{t-1} = m_{t-1}Y^{h}_{t-1}$ and $v^{£}_{t-1} = m_{t-1}v^{h}_{t-1}$. MELT also allows us to express appropriated values (in monetary expression, $Q^{£*}_{t-1} = p^{£}_{t-1}Q^{o}_{t-1}$, $Y^{£*}_{t-1} = p^{£}_{t-1}(Q^{o}_{t-1} + U^{o}_{t-2})$ and $v^{£*}_{t-1} = p^{£}_{t-1}$) in

terms of labour-time, $Q^{h*}_{t-1} = Q^{£*}_{t-1}/m_{t-1}$, $Y^{h*}_{t-1} = Y^{£*}_{t-1}/m_{t-1}$ and $v^{h*}_{t-1} = p^{£}_{t-1}/m_{t-1}$. With more than one commodity, for each commodity, value produced is likely to differ from value appropriated, with MELT allowing us to express this difference either in monetary expression or labour-time. Let us stress that we do not have two sets of prices/appropriated values. In our model we exogenously set price at the end of production, revealing appropriated values in terms of nominal units of money. Knowing both produced values in terms of labour-time and appropriated values in terms of nominal money at the end of production enables us to calculate MELT at the end of production. MELT allows us to express produced values in nominal units of money, or appropriated values in labour-time, thus facilitating comparison of produced and appropriated values in the same units (either in nominal units of money or labour-time). Produced values in terms of nominal units of money thus do not represent a second set of prices/appropriated values.

We assume no stocks are carried over into production in period t-1 from circulation at the end of period t-2 ($U^{o}_{t-2} = 0$), to eliminate the question of stock re-valuation at the end of production at t-1. We only need to exogenously set nominal price, physical output and the produced value in terms of labour-time of that physical output (in bold in Table 1, along with zero stocks from period t-2), to determine all end-production period values. With no stocks, end-production period t-1 MELT (m_{t-1}) and the produced unit value of our commodity in terms of labour time (v^{h}_{t-1}), are given by:

$$m_{t-1} = Y^{£*}_{t-1} / Y^{h}_{t-1} = Q^{£*}_{t-1} / Q^{h}_{t-1} = p^{£}_{t-1}Q^{o}_{t-1} / Q^{h}_{t-1} = 135 / 135 = 1$$
$$v^{h}_{t-1} = Y^{h}_{t-1} / Y^{o}_{t-1} = Q^{h}_{t-1} / Q^{o}_{t-1} = 135 / 27 = 5$$

Total capital equals the total output of our single commodity, with $Q^{£*}_{t-1}$ and Q^{h}_{t-1} set such as to ensure $m_{t-1} = 1$ so, variables' monetary expressions will equal their labour-time values. We have just explained how MELT allows us to calculate the monetary expression of produced values and appropriated values in terms of labour-time. In our one-commodity model appropriated values must equal produced values, obscuring the TSSI's non-dualistic nature.

Let us now consider circulation at the end of period t-1. As we assume circulation is instantaneous, and price is formed at the end of production before circulation, it

would seem reasonable to assume demand is also determined at the end of production, before circulation. Circulation merely records how titles to commodities change. We exogenously set capitalists' demand for constant capital input next period and their personal consumption demand for next period, and workers' demand/capitalists' advance of variable capital for next period (all in bold in Table 1). 5 physical units of stock will be carried over to period t ($U^{o}_{t-1} = Q^{o}_{t-1} - D^{o}_{t-1}$). Note, $D^{h*}_{t-1} + U^{h*}_{t-1} = Y^{h*}_{t-1} = Y^{h}_{t-1}$ and $D^{£*}_{t-1} + U^{£*}_{t-1} = Y^{£*}_{t-1} = Y^{£}_{t-1} = m_{t-1}Y^{h}_{t-1}$, price formation, at the end of production, and subsequent circulation, cannot alter the total value produced in production.

We now move to the start of production in period t. We have already set, in circulation at the end of period t-1, period t inputs in physical terms (C^{o}_{t} and V^{o}_{t}) and the level of stocks to be carried over to period t (U^{o}_{t-1}). Equations (1) to (3) show how C^{h*}_{t}, V^{h*}_{t} and U^{h*}_{t-1} are given by their monetary expressions divided by end-period t-1 MELT (which is equivalent to their appropriated unit value in terms of labour-time at the end of period t-1 multiplied by their physical quantity):

(1) $C^{h*}_{t} = C^{£*}_{t} / m_{t-1} = v^{h*}_{t-1}C^{o}_{t} = 5 \times 15 = 75$

(2) $V^{h*}_{t} = V^{£*}_{t} / m_{t-1} = v^{h*}_{t-1}V^{o}_{t} = 5 \times 5 = 25$

(3) $U^{h*}_{t-1} = U^{£*}_{t-1} / m_{t-1} = v^{h*}_{t-1}U^{o}_{t-1} = 5 \times 5 = 25$

(4) $S^{h}_{t} = L^{h}_{t} - V^{h*}_{t} = 50 - 25 = 25$

(5) $r^{h}_{t} = S^{h}_{t} / V^{h*}_{t} = 25 / 25 = 100\%$

With $m_{t-1} = 1$ inputs are identical in monetary and labour-time expression. In production at t L^{h}_{t} labour-time is worked, which as V^{h*}_{t} is already given, determines surplus labour-time S^{h}_{t} (equation 4). We can now calculate the rate of exploitation of labour (equation 5). Equations (1) to (5) hold for both Kliman's and Freeman's approaches. Note, how we treat stocks is irrelevant to the rate of exploitation of labour; any potential 'waste' of surplus-value is of no concern to the workers who produce it.

Let us firstly apply Kliman's approach, as recorded in Table 2.

Table 2 – Production In Period t – Kliman.

Units	Start Production in Period t			End Production in Period t				
	C	V	U	L	S	r	p	M
o	**15**	**5**	**5**					
£	**75**	**25**	**25**	60	30		**5**	1.2
h	**75**	**25**	**25**	**50**	25	100%		

Units	End Production in Period t (continued)									
	Value Produced					Value Appropriated				
	Q	U	Y	*v*	*ρ*	Q	U	Y	*v*	*ρ*
o	**30**	5	35		40%	30	5	35		40%
£ (K)	150	25	175	5	40%	150	25	175	5	40%
h (K)	125	20.83	145.83	4.167	16.67%	125	20.83	145.83	4.167	16.67%

Following Kliman's approach we calculate the produced unit value in terms of labour-time of our single commodity at the end of production at t by only considering the value in terms of labour-time and the physical quantity of total output:

(6) $Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t = 75 + 25 + 25 = 125$

(7) $v^h_t = Q^h_t / Q^o_t = [v^{h*}_{t-1}(C^o_t + V^o_t) + S^h_t] / Q^o_t = 125 / 30 = 4.167$

(8) $U^h_{t-1} = v^h_t U^o_{t-1} = 4.167 \times 5 = 20.83$

Equation (6) ensures that by Kliman's approach the value of newly produced output always equals the constant capital transferred and the living labour added in the production of this output.

Productivity improves in period t ($v^h_t < v^{h*}_{t-1} = v^h_{t-1}$). Stocks, held through production at t, do not enter production, and, as such, do not influence the unit value of our commodity, but through being identical in use-value, must share the same produced unit value at the end of production in period t as period t output. Equation (8) determines stocks produced value in terms of labour-time time at the end of production at t, with $U^{£}_{t-1} = m_t U^h_{t-1}$ monetary expression. We are now stretching our notation. U^{h*}_{t-1} and $U^{£*}_{t-1}$ apply to the start of production at t, being the appropriated value of stocks, in labour-time and monetary expression respectively, at the end of period t-1. U^h_{t-1} and $U^{£}_{t-1}$ are the produced values of stocks, in labour-time and monetary expression respectively, at the end of production in period t. $U^{h*}_{t-1} = U^{£*}_{t-1}/$

m_t and $U^{£*}_{t-1} = p^{£}_{t}U^{o}_{t-1}$ are the appropriated values of stocks, in labour-time and monetary expression respectively, at the end of production in period t (requiring the use of Italics to show their difference to U^{h*}_{t-1} and $U^{£*}_{t-1}$ at the start of production). We can now calculate, at the end of production at t, the produced value of total capital in terms of labour-time:

(9) $\quad Y^{h}_{t} = Q^{h}_{t} + U^{h}_{t-1} = v^{h}_{t}Q^{o}_{t} + v^{h}_{t}U^{o}_{t-1} = 125 + 20.83 = 145.83$

Total capital does not necessarily grow by the S^{h}_{t} extracted in production:

$Y^{h}_{t} - (C^{h*}_{t} + V^{h*}_{t} + v^{h*}_{t-1}U^{o}_{t-1}) =$
$C^{h*}_{t} + V^{h*}_{t} + S^{h}_{t} + v^{h}_{t}U^{o}_{t-1} - C^{h*}_{t} - V^{h*}_{t} - v^{h*}_{t-1}U^{o}_{t-1} =$
$S^{h}_{t} + (v^{h}_{t} - v^{h*}_{t-1})U^{o}_{t-1} \; \gamma \; S^{h}_{t}$ unless $v^{h}_{t} = v^{h*}_{t-1}$.

Note, in our simple example, without constant capital, we also abstracted from how the total living labour applied split into variable capital and surplus value. We stressed that the total value of new commodities and carried over stocks will rise above the start period value of carried over stocks by the total living labour applied in production by Freeman's approach, but not by Kliman's approach if productivity changes. In our example with constant capital, following Kliman's approach, the total value of new output and carried over stocks will not rise above the value of constant capital inputs and carried over stocks at the start of production by the total living labour applied in production if productivity changes:

$Y^{h}_{t} - (C^{h*}_{t} + v^{h*}_{t-1}U^{o}_{t-1}) = C^{h*}_{t} + L^{h}_{t} + v^{h}_{t}U^{o}_{t-1} - C^{h*}_{t} - v^{h*}_{t-1}U^{o}_{t-1} =$
$L^{h}_{t} + (v^{h}_{t} - v^{h*}_{t-1})U^{o}_{t-1} \; \gamma \; L^{h}_{t}$ unless $v^{h}_{t} = v^{h*}_{t-1}$.

However, now we have specified how variable capital is advanced, this is no longer the question we wish to pose. The question becomes, will the total produced value of new output and carried over stocks rise above the value of carried over stocks and the value of constant and variable capital applied at the start of production, by the total surplus-value extracted from labour in production? Put simply will total capital

expand by S^h_t over production, and the answer for Kliman is no if productivity changes.

To calculate the produced value profit rate in terms of labour-time we must include the start-period value of stocks in terms of labour-time as part of total capital advanced. If $v^h_t \gamma v^{h*}_{t-1}$ total capital will not grow by S^h_t, so we must adjust S^h_t by any change in the value of these stocks in terms of labour-time over production period t:

$$\rho^h_t = [Y^h_t - (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1})] / (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1})$$

$$(10) \quad \rho^h_t = [S^h_t - (v^{h*}_{t-1} - v^h_t)U^o_{t-1}] / (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1})$$

$$\rho^h_t = [25 - (5 - 4.167) \times 5] / (75 + 25 + 5 \times 5) = 16.67\%$$

As we assume price is established (in our model exogenously set at £5) at the end of production at t we can calculate end-period t MELT (established at the end of production at t and holding through circulation at the end of period t):

$$(11) \quad m_t = Y^{£*}_t / Y^h_t = p^£_t(Q^o_t + U^o_{t-1}) / v^h_t(Q^o_t + U^o_{t-1}) = p^£_t Q^o_t / v^h_t Q^o_t = Q^£_t / Q^h_t$$

$$m_t = Y^{£*}_t / Y^h_t = 175 / 145.83 = 1.2$$

We have defined MELT as the total price of capital divided by the total produced value of that capital. This is so if we follow Kliman's method, but as equations (7) and (11) make clear the start period t value of stocks is irrelevant to our calculation of MELT, which is essential a *newly produced output MELT*. $Y^{£*}_t/Y^h_t = Q^{£*}_t/Q^h_t$ because we re-value stocks to the value of newly produced output before we calculate Y^h_t:

$$(12) \quad \rho^o_t = S^o_t / (C^o_t + V^o_t + U^o_{t-1}) = 10 / (15 + 5 + 5) = 40\%$$

We can see how the produced value profit rate in terms of labour-time is substantially lower than the physical profit rate (given by equation 12). Note, the physical surplus product ($S^o_t = Q^o_t - C^o_t - V^o_t$) does not embody total surplus-value by the TSSI, unless productivity is constant ($v^h_t = v^{h*}_{t-1}$). Produced values in labour-time expression can be put in monetary expression by simply multiplying them by end-period t MELT. At the end of production in period t, appropriated values in terms of labour-time, are

given by their monetary expression divided by the MELT established at the end of production in period t. Note, total advanced capital, $C^{£*}_t + V^{£*}_t + U^{£*}_{t-1}$ in equation (17), is divided by end-period t-1 MELT, the MELT holding when that capital was advanced:

(13) $v^{h*}_t = p^{£}_t / m_t = 5 / 1.2 = 4.167$

(14) $Q^{h*}_t = Q^{£*}_t / m_t = p^{£}_t Q^{o}_t / m_t = 150 / 1.2 = 125$

(15) $U^{h*}_{t-1} = U^{£*}_{t-1} / m_t = p^{£}_t U^{o}_{t-1} / m_t = 25 / 1.2 = 20.83$

(16) $Y^{h*}_t = Y^{£*}_t / m_t = p^{£}_t (Q^{o}_t + U^{o}_{t-1}) / m_t = 175 / 1.2 = 145.83$

(17) $\rho^{h*}_t = [Y^{£*}_t / m_t - (C^{£*}_t + V^{£*}_t + U^{£*}_{t-1}) / m_{t-1}] / [(C^{£*}_t + V^{£*}_t + U^{£*}_{t-1}) / m_{t-1}]$

$\rho^{h*}_t = (145.83 - 125) / 125 = 16.67\%$

(18) $\rho^{£*}_t = (Y^{£*}_t - C^{£*}_t - V^{£*}_t - U^{£*}_{t-1}) / (C^{£*}_t + V^{£*}_t + U^{£*}_{t-1})$

$\rho^{£*}_t = (175 - 125) / 125 = 40\%$

Appropriated values equal produced values in labour-time and monetary expression in Table 2, as we would expect for a one-commodity aggregate model. Finally, the appropriated rate of profit in nominal money terms is given by equation (18).

With Kliman's approach to valuation in the presence of stocks hopefully clear and correctly interpreted, let us move on to hopefully correctly interpreting Freeman's alternative treatment of valuation in the presence of stocks. As the difference between Kliman's approach and Freeman's approach emerges at the end of production in period t we shall consider circulation at the end of period t after we have explored Freeman's approach to valuation in the presence of stocks.

As we explained equations (1) to (5) hold for both approaches, with the difference between approaches emerging when we consider the produced unit value of our commodity in terms of labour-time at the end of production at t. We do not, like Kliman, calculate the produced unit value of our commodity in terms of labour-time by equation (7) and re-value stocks by equation (8). Alternatively, Freeman carries the start production period value of stocks in terms of labour-time (U^{h*}_{t-1}), through production, intact, to the end of production to, with the constant capital transferred in production and living labour added ($C^{h}_t + V^{h}_t + S^{h}_t$), establish the total produced value

of capital in terms of labour-time (Y^h_t). Equations in red are for Freeman's approach, with equations still presented in black being the same for both approaches:

(9) $Y^h_t = C^{h*}_t + V^{h*}_t + S^h_t + U^{h*}_{t-1} = 125 + 25 = 150$

$Y^h_t - C^{h*}_t - V^{h*}_t - v^{h*}_{t-1}U^o_{t-1} = S^h_t$

(10) $\rho^h_t = S^h_t / (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1}) = 25 / 125 = 20\%$

Freeman's total produced value in terms of labour-time, Y^h_t, is a little higher as stocks are not re-valued downwards, to reflect productivity improvement, before we include them in Y^h_t. Freeman's produced value profit rate in terms of labour-time is consequently a little higher. Although the denominator in equation (10) is the same for both approaches, Freeman's numerator is larger through not needing to deduct stock revaluation from S^h_t. This is because, as the rearrangement of equation (9) makes clear, in contrast to Kliman's approach, total capital expands by S^h_t over production in period t no matter if productivity changes.

Table 3 – Production In Period t – Kliman and Freeman.

Units	Start Production in Period t			End Production in Period t				
	C	V	U	L	S	r	p	M
o	**15**	**5**	**5**					
£ (K)	**75**	**25**	**25**	60	30		**5**	1.2
h (K)	**75**	**25**	**25**	**50**	25	100%		
£ (F)	**75**	**25**	**25**	58.13	29.17		**5**	1.167
h (F)	**75**	**25**	**25**	**50**	25	100%		

Units	End Production in Period t (continued)									
	Value Produced					Value Appropriated				
	Q	U	Y	*v*	*ρ*	Q	U	Y	*v*	*ρ*
o	**30**	5	35		40%	30	5	35		40%
£ (K)	150	25	175	5	40%	150	25	175	5	40%
h (K)	125	20.83	145.83	4.167	16.67%	125	20.83	145.83	4.167	16.67%
£ (F)	150	25	175	5	40%	150	25	175	5	40%
h (F)	128.57	21.43	150	4.286	20%	128.57	21.43	150	4.286	20%

Table 3 records our example calculated by Freeman's approach in red, below Kliman's approach in black. Following Freeman's approach we do not need to know

Q^o_t to calculate Y^h_t or ρ^h_t. Freeman's calculation of Y^h_t and ρ^h_t are unaffected by the actual level of Q^o_t produced in period t and, thus, are also unaffected by the produced unit value of our commodity in terms of labour-time at the end of production in period t, v^h_t. Freeman's equation (7) calculates v^h_t by dividing total capital, in terms of labour-time, by the total number of units of our commodity in existence, whether they are new output or carried over stocks:

(7) $v^h_t = Y^h_t / Y^o_t = [v^{h*}_{t-1}(C^o_t + V^o_t + U^o_{t-1}) + S^h_t] / (Q^o_t + U^o_{t-1}) = 150/35 = 4.286$

Carrying over the start-period value of stocks in terms of labour-time, without revaluation, to form part of Y^h_t, ensures v^h_t is a little higher by Freeman's approach. Freeman consequently has a different, to Kliman's, concept of what the produced unit value of our commodity in terms of labour-time should be. Let us be clear, Freeman does re-value stocks, at the end of production. A unit of stock will have the same v^h_t as a unit of newly produced output at the end of production (with in our example $v^h_t < v^{h*}_{t-1}$), equation (8) holds for both approaches. But if productivity changes the two approaches calculate different values of v^h_t, explaining why U^h_{t-1} is different between approaches:

(8) $U^h_{t-1} = v^h_t U^o_{t-1} = 4.286 \times 5 = 21.43$

For both approaches $Q^h_t = v^h_t Q^o_t$, but if productivity changes the two approaches calculate different values of v^h_t, explaining why Q^h_t differs. Let us find the value of newly produced output by deducting the end production value of stocks, as given by equation (8), from the value of total capital at the end of production, as given by equation (9):

$Q^h_t = Y^h_t - U^h_{t-1}$

$Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t + U^{h*}_{t-1} - U^h_{t-1}$

$Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t + v^{h*}_{t-1}U^o_{t-1} - v^h_t U^o_{t-1}$

(6) $Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t + (v^{h*}_{t-1} - v^h_t)U^o_{t-1}$

$Q^h_t = 125 + 3.57 = 128.57 \;\gamma\; C^{h*}_t + V^{h*}_t + S^h_t = 75 + 25 + 25 = 125$

By Freeman's approach the value of newly produced output does not equal the constant capital transferred and the living labour added in the production of this output, unless productivity is constant.

With produced values in terms of labour-time Y^{h}_{t}, U^{h}_{t-1}, Q^{h}_{t} and v^{h}_{t} established let us calculate the MELT that is also established at the end of production when we assume price is formed. We again exogenously set $p^{£}_{t}$ at £5 to reveal all appropriated values in terms of nominal units of money. Equation (11) holds for both approaches, but does not amount for Freeman, like it does for Kliman, to a newly produced output MELT:

(11) $m_t = Y^{£*}_{t} / Y^{h}_{t}$

$m_t = (Q^{£*}_{t} + U^{£*}_{t-1}) / (C^{h*}_{t} + V^{h*}_{t} + S^{h}_{t} + v^{h*}_{t-1}U^{o}_{t-1})$

$m_t = 175 / (125 + 25) = 1.167$

Carrying forward the start period value of stocks to form part of the value of total capital at the end of production ensures MELT is not solely determined by the monetary expression of produced output divided by the constant capital transferred and the living labour added in production. With MELT established we calculate the monetary expression of produced values by multiplying those produced values in terms of labour-time by MELT. MELT also allows us to calculate the labour-time expression of appropriated values by equations (13) to (17). Note equations (13) to (17) are common to both approaches, but produce different results through the approaches' different calculation of MELT:

(13) $v^{h*}_{t} = p^{£}_{t} / m_t = 5 / 1.2 = 4.286$

(14) $Q^{h*}_{t} = Q^{£*}_{t} / m_t = p^{£}_{t}Q^{o}_{t} / m_t = 150 / 1.167 = 128.57$

(15) $U^{h*}_{t-1} = U^{£*}_{t-1} / m_t = p^{£}_{t}U^{o}_{t-1} / m_t = 25 / 1.167 = 21.43$

(16) $Y^{h*}_{t} = Y^{£*}_{t} / m_t = p^{£}_{t}(Q^{o}_{t} + U^{o}_{t-1}) / m_t = 175 / 1.167 = 150$

(17) $\rho^{h*}_{t} = [Y^{£*}_{t} / m_t - (C^{£*}_{t} + V^{£*}_{t} + U^{£*}_{t-1}) / m_{t-1}] / [(C^{£*}_{t} + V^{£*}_{t} + U^{£*}_{t-1}) / m_{t-1}]$

$\rho^{h*}_{t} = (150 - 125) / 125 = 20\%$

Appropriated values continue to equal produced values, in both labour-time and monetary expression, as they must through our assumption of a single commodity.

Finally both approaches share equations (12) and (18), being as they are, purely in physical and nominal money terms respectively:

(12) $\rho^{o}_{t} = S^{o}_{t} / (C^{o}_{t} + V^{o}_{t} + U^{o}_{t-1}) = 10 / (15 + 5 + 5) = 40\%$

(18) $\rho^{£}_{t} = (Y^{£*}_{t} - C^{£*}_{t} - V^{£*}_{t} - U^{£*}_{t-1}) / (C^{£*}_{t} + V^{£*}_{t} + U^{£*}_{t-1}) = 50 / 125 = 40\%$

For both approaches circulation now neutrally occurs/commodities are merely re-distributing, see Table 4.

Table 4 – Circulation At The End Of Period t-1 – Kliman and Freeman.

Units	Circulation at end of Period t				
	Demand			U	D+U
	C	V	K		
o	**18**	**5**	**5**	7	35
£ (K)	90	25	25	35	175
h (K)	75	20.83	20.83	29.17	148.83
£ (F)	90	25	25	35	175
h (F)	77.14	21.43	21.43	30	150

We exogenously set demand for period t+1 inputs and capitalists' personal consumption, to reveal the level of stocks to be carried over into period t+1. Circulation at the end of period t redistributes commodities, but does not effect their values. A unit of our single commodity will be valued in money terms by the same price ($p^{£}_{t}$), and in labour-time terms by the same appropriated unit value (v^{h*}_{t}), whether it is sold or, becomes stock to be carried over to period t+1. Price formation, at the end of production at t, and following circulation, neither, creates or destroys value, $D^{h*}_{t} + U^{h*}_{t} = Y^{h*}_{t} = Y^{h}_{t}$ and $D^{£*}_{t} + U^{£*}_{t} = Y^{£*}_{t} = Y^{£}_{t} = m_{t}Y^{h}_{t}$.

In summary, both Kliman and Freeman follow the TSSI's sequential and non-dualistic method, this period's produced values depend on last period's appropriated values, and assume price is formed at the end of production. But Kliman and Freeman differ in their concept of what the produced unit value of our commodity should be, through their contrasting methods of valuation in the presence of stocks. By Kliman's method productivity improvement ensures the value of total capital falls short of the value of capital advanced plus the surplus-value extracted in production, but the value of

newly produced output always equals the constant capital transferred and the living labour added in the production of this output. In contrast by Freeman's method the value of total capital always grows by the surplus-value extracted in production, but productivity improvement ensures the value of newly produced output exceeds the constant capital transferred and the living labour added in the production of this output.

Let us now repeat the same example, but now assume productivity regresses by setting Q^{o}_{t} equal to 22, see Table 5, Kliman in black and Freeman in red.

Table 5 – Period t – Kliman and Freeman – Example 2.

Units	Start Production in Period t			End Production in Period t				
	C	V	U	L	S	r	p	M
o	**15**	**5**	**5**					
£ (K)	**75**	**25**	**25**	44	22		**5**	0.88
h (K)	**75**	**25**	**25**	**50**	25	100%		
£ (F)	**75**	**25**	**25**	45	22.5		**5**	0.9
h (F)	**75**	**25**	**25**	**50**	25	100%		

Units	End Production in Period t (continued)									
	Value Produced					Value Appropriated				
	Q	U	Y	*v*	*ρ*	Q	U	Y	*v*	*ρ*
o	**22**	5	27		8%	30	5	35		40%
£ (K)	110	25	135	5	8%	110	25	135	5	8%
h (K)	125	28.41	153.41	5.682	22.73%	125	28.41	153.41	5.682	22.73%
£ (F)	135	25	135	5	8%	135	25	135	5	8%
h (F)	122.22	27.78	150	5.556	20%	122.22	27.78	150	5.556	20%

Units	Circulation at end of Period t				
	Demand			U	D+U
	C	V	K		
o	**15**	**5**	**4**	3	27
£ (K)	75	25	20	15	135
h (K)	85.23	28.41	22.73	17.05	153.41
£ (F)	75	25	20	15	135
h (F)	83.33	27.78	22.22	16.67	150

For Kliman, equations in black, end production period t produced values in terms of labour-time are given by:

(6) $Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t = 75 + 25 + 25 = 125$

(7) $v^h_t = Q^h_t / Q^o_t = [v^{h*}_{t-1}(C^o_t + V^o_t) + S^h_t] / Q^o_t = 125 / 22 = 5.682$

(8) $U^h_{t-1} = v^h_t U^o_{t-1} = 5.682 \times 5 = 28.41$

(9) $Y^h_t = Q^h_t + U^h_{t-1} = v^h_t Q^o_t + v^h_t U^o_{t-1} = 125 + 28.41 = 153.41$

(10) $\rho^h_t = [S^h_t - (v^{h*}_{t-1} - v^h_t)U^o_{t-1}] / (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1})$

$\rho^h_t = [25 - (5 - 5.682) \times 5] / (75 + 25 + 5 \times 5) = 22.73\%$

(11) $m_t = Y^{£*}_t / Y^h_t = p^£_t(Q^o_t + U^o_{t-1}) / v^h_t(Q^o_t + U^o_{t-1}) = p^£_t Q^o_t / v^h_t Q^o_t = Q^{£*}_t / Q^h_t$

$m_t = Q^{£*}_t / Q^h_t = 110 / 125 = 0.88$

Equation (6) ensures no matter what happens to productivity, that the value of newly produced output in terms of labour-time always equals the constant capital transferred and the living labour added in the production of this output. Productivity regress ensures stocks increase in value in terms of labour-time. The value of total capital in terms of labour-time, given by equation (9), is above the value of the capital advanced plus the surplus-value extracted in production, thus boosting the profit rate in terms of labour-time given by equation (10). We again set $p^£_t$ at £5. MELT now falls to £0.88 per hour of labour-time. Produced values in monetary expression equal their labour-time values multiplied by MELT, and appropriated values in terms of labour-time equal their nominal expression in money divided by MELT.

Let us now consider productivity regress following Freeman's approach, with equations in red. End production period t produced values in terms of labour-time are given by:

(9) $Y^h_t = C^{h*}_t + V^{h*}_t + S^h_t + U^{h*}_{t-1} = 125 + 25 = 150$

$Y^h_t - C^{h*}_t - V^{h*}_t - v^{h*}_{t-1}U^o_{t-1} = S^h_t$

(10) $\rho^h_t = S^h_t / (C^{h*}_t + V^{h*}_t + v^{h*}_{t-1}U^o_{t-1}) = 25 / 125 = 20\%$

(7) $v^h_t = Y^h_t / Y^o_t = [v^{h*}_{t-1}(C^o_t + V^o_t + U^o_{t-1}) + S^h_t] / (Q^o_t + U^o_{t-1}) = 150/27 = 5.556$

(8) $U^h_{t-1} = v^h_t U^o_{t-1} = 5.556 \times 5 = 27.78$

(6) $Q^h_t = C^{h*}_t + V^{h*}_t + S^h_t + (v^{h*}_{t-1} - v^h_t)U^o_{t-1}$

$Q^h_t = 125 - 2.78 = 122.22$

(11) $m_t = Y^{£*}_t / Y^h_t$

$$m_t = (Q^{£*}_t + U^{£}_{t-1}) / (C^{h*}_t + V^{h*}_t + S^{h}_t + v^{h*}_{t-1}U^{o}_{t-1}) = 135 / (125 + 25) = 0.9$$

As we pointed out, when we considered productivity improvement, Freeman's calculation of Y^h_t and ρ^h_t do not depend on Q^o_t, so are unchanged now productivity regresses from when productivity improved. Total capital in terms of labour-time grows by the total surplus-value extracted from labour in production, no matter what happens to productivity. With Y^h_t ($Y^h_t = C^{h*}_t + V^{h*}_t + S^h_t + U^{h*}_{t-1} = Q^h_t + U^h_{t-1}$) unchanged, and stocks appreciating in value ($U^h_{t-1} > U^{h*}_{t-1}$), Q^h_t must now fall short of $C^{h*}_t + V^{h*}_t + S^h_t$. Newly produced output now embodies less value in terms of labour-time than the constant capital transferred and the living labour added in the production of this output. We continue to set $p^{£}_t$ at £5, revealing appropriated values in terms of nominal units of money. MELT falls to £0.9 per hour of labour-time. We calculate produced values in monetary expression by multiplying their labour-time expression by MELT, and appropriated values in terms of labour-time by dividing their monetary expression by MELT. Now productivity regresses, for both approaches, the physical profit rate falls below the profit rate in terms of labour-time (which for Freeman is constant at 20%, and for Kliman is boosted to 22.73%).

Circulation for both approaches is recorded at the bottom of Table 5. We exogenously set demand for period t+1 inputs and capitalists' personal consumption, to reveal the level of stocks to be carried over into period t+1. Again, as a unit of our single commodity will be valued in terms of money by the same price, and in labour-time by the same appropriated unit value, whether it is sold or, becomes stock carried over to period t+1, the pattern of exchange we assume in circulation can not alter values. Price formation, at the end of production at t, and following circulation, neither, creates or destroys value, $D^{h*}_t + U^{h*}_t = Y^{h*}_t = Y^h_t$ and $D^{£*}_t + U^{£*}_t = Y^{£*}_t = Y^{£}_t = m_t Y^h_t$.

To sum up, if we follow Kliman's approach we appear to contradict Marx's insistence that surplus labour is the sole source of profit. Total capital in terms of labour-time grows by more than the surplus labour-time extracted in production in that period if productivity regresses, whereas it fails to expand by the surplus labour-time extracted in production in that period if productivity improves. Alternatively if we follow Freeman's approach total capital in terms of labour-time does expand by the surplus

labour-time extracted in production in that period, no matter if productivity improves or regresses. So is there a problem with Kliman's approach?

However, following Kliman's approach does ensure, whether productivity improves or regresses, that the value of newly produced commodities equals the constant capital transferred and the living labour added to them in production in that period. If we follow Freeman's approach, when productivity improves (regresses) the value of newly produced commodities falls short of (exceeds) the constant capital transferred and the living labour added to them in production in that period. So is there a problem with Freeman's approach?

We suggest that neither approach has a problem, rather, they simple interpret how Marx determines commodities' values differently. If like Kliman, we interpret that Marx considered commodity values as being determined by the value of newly produced commodities we must accept the need to re-value stocks, which are not currently applied to production, to reflect the value of newly produced commodities. Note if we included fixed capital, fixed capital applied but not used up in that period would likewise need to be re-valued to reflect the value of newly produced units of fixed capital. Stock revaluation changes the value of total capital, but can we really imagine that this is a creation or destruction of value by some source of value other than labour? It is simply a change in the value of commodities that are not participating in the formation of values as determined by current production conditions. Alternatively Freeman interprets that Marx considered commodity values to be determined not only by the values of newly produced commodities, but by the value of existing units of those commodities as well. We simply have two interpretations of how Marx determines commodities' values, which both follow a sequential and non-dualistic method i.e. both follow a TSSI of Marx.

Conclusion.

Through considering the question how to value commodities in the presence of stocks of these commodities, we hope to have shown how the TSSI of Marx represents an exciting and open approach to researching Marx's economics. Quite simply Laibman's labelling of the TSSI as the dogma of 'the new orthodox Marxists (NOMists)' (Laibman 1999, page 253) could not be more mistaken. Questions such as how to treat fixed capital or, stocks of commodity money or, how changes to demand/price may change commodities' socially determined values, all require/are excitedly open for further research. Personally I have employed a sequential and non-dualistic approach (Potts, 2005) to try to begin to consider how we might integrate the productive economy and the financial system together. I do not claim to have done more than scratch the surface of this critical area of research, with Potts (2007) representing the current status of that scratch. However I am already convinced that simultaneous approaches generate concepts of value too rigidly stuck in their simultaneous limitations to integrate with the dynamic behaviour of the financial system. For example Fine, Lapavitsas and Milonakis (1999) consider questions of value theory and then monetary/financial questions in distinct sections, reflecting mainstream economics focus on studying the 'real' economy and monetary economics, as a separate discipline, studying the monetary/financial system. To conclude we believe the TSSI of Marx has proven its right to exist, so let us explore how it can help us understand our world.

Nick.Potts@Solent.ac.uk

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Endnotes.

1. Bortkiewicz (1952 and 1984) 'discovered' that, if value was interpreted in a simultaneous and dualistic fashion, then value becomes an inconsistent/internally contradictory concept, as expressed by the failure of 'Marx's' transformation 'problem' to add-up. Total value may be equated to total price (Winternitz, 1948) or, total profit may be equated to total surplus-value (as in Bortkiewicz's 'solution') or, the price of wage goods may be equated to their value (Seton, 1957). However, as Kliman (2007) makes clear, it is Bortkiewicz's simultaneous and dualistic concept of value, which is internally inconsistent, not Marx's concept of value, if we interpret Marx, as the TSSI interprets Marx, as having a sequential and non-dualistic concept of value. Following the TSSI of Marx, all three of Marx's aggregate equalities hold in the transformation 'problem' (Kliman and McGlone, 1988). Marx's sequential and non-dualistic concept of value is – and always has been – internally consistent (Kliman, 2007).

2. If production proceeds as planned the labour-time promised in the wage bargain is delivered. If, for any reason, actual labour-time falls short of (or exceeds) the labour-time promised in the wage bargain, it is this reduced (or higher) level of labour-time, that we deduct the value of variable capital from, to establish surplus labour-time. We assume all labour-time magnitudes are in units of average socially necessary simple labour-time (with no specific skill and average intensity, put to work under socially average conditions of production).

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