

IIPPE Training Workshop

Value and Price (The Transformation Problem)

Simon Mohun

s.mohun@qmul.ac.uk

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Summary: LTV From Smith to Marx I

- Commodity law of exchange
 - prices are ‘simple’ or ‘direct’

$$p_i = \frac{\lambda_i}{\lambda_m}$$

- Capitalist law of exchange
 - prices are ‘prices of production’

$$p_i^{pop} = \left(\sum_{j=1}^{j=n} a_{ji} p_j^{pop} + w l_i \right) (1 + r)$$

- How are these laws compatible?

Summary: LTV From Smith to Marx II

- Smith
 - develops capitalist law of exchange
 - could only develop commodity law of exchange for simple noncapitalist economy, and so abandons it
- Ricardo
 - retains Smith's capitalist law of exchange
 - develops commodity law of exchange for a capitalist economy
 - couldn't reconcile simultaneous application of both laws
- Marx
 - retains Smith's capitalist law of exchange
 - retains Ricardo's commodity law of exchange
 - exactly in market for labour power and for total value added
 - shows how in all other markets unequal exchange of values is necessary for the simultaneous application of both laws
 - precisely how is what 'transformation problem' is about

Perspective

- Much ado about what?
 - how to specify a theory of exploitation based on the LTV that is compatible with the theory of competition
- Classical LTV: for any commodity
 - $\text{price} = \text{value}/(\text{value of money})$
- Classical theory of competition
 - $\text{price} = \text{costs} + \text{markup}$
- These 2 accounts of price logically incompatible (Ricardo)
- Marx's solution
 - accounts compatible for aggregates, not individual commodities
- Dualism (von Bortkiewicz to Steedman)
 - separate (invisible) value and (visible) price systems, with former playing no role in latter
 - Marx wrong; can't have compatibility (other than FMT) and no need for it anyway

Marx's Tableau I

- Mechanics of Marx's procedure

$$c_i + v_i + s_i = w_i$$

$$e = \sum s_i / \sum v_i$$

$$c_i/v_i \neq c_j/v_j \text{ all } i, j$$

$$R = \sum s_i / (\sum c_i + \sum v_i)$$

$$p_i = (c_i + v_i)(1 + R)$$

if $(c_i + v_i)$ are interpreted as evaluated in direct/simple prices, then we are concerned with the transformation of direct/simple prices (confusingly called 'values') into prices of production

- Properties of procedure

$p_i > w_i$ if and only if $c_i/v_i > \sum c_i / \sum v_i$ and conversely

$$\sum w_i = \sum p_i \text{ ["total value = total price"]}$$

$$\sum s_i = R (\sum c_i + \sum v_i) \text{ ["total surplus value = total profit"]}$$

Marx's Tableau II

- What are the constants applying across both the 'value system' and the 'price system'?
 1. total value added
total surplus value
total variable capital
economy-wide rate of surplus value
 2. total constant capital
total price (ie total gross revenues)
 3. average rate of profit for the economy

Dual-System Approach

- These issues were represented from 1890s to 1970s as two coexisting systems:
 - underlying and invisible system of ‘values’ proportional to embodied labour coefficients (the value system)
 - categories such as v/p and $e (= s/v)$ interpreted in terms of this underlying system of values
 - phenomenal system of money prices (the price system)
- What is relation between value system and price system?
 - study of this relation constituted the ‘problem of the transformation of values into prices of production’ or ‘the transformation problem’
 - main authors: von Bortkiewicz 1907 (via Sweezy 1942); Seton (1956); Morishima (1973); Pasinetti (1977); Steedman (1977); Roemer (1981) and many others

Is Marx's Procedure Correct? The Dualist Approach

Treatment of Constant Capital

- Procedure is **incomplete**
 - means of production sold at (unequal exchange) prices of production but bought at (equal exchange) prices
 - easy to correct
 - cannot just apply relevant output price of production to relevant inputs, because all the invariances of the procedure will breakdown
 - hence sequential approach problematic
- Procedure is **inconsistent**
 - Marx's formula for the general rate of profit is wrong
 - capitalists base their decisions on prices, not direct/simple prices

Is Marx's Procedure Correct? The Dualist Approach

Treatment of Variable Capital

- Variable capital (in money terms) =
 $\{v/p \text{ per hour} * \text{number of hours}\} \div \text{value of money}$
 - hold value of money constant; H is constant, so focus on v/p
- Assume v/p is the value of the real wage or wage-bundle of commodities (justification: *Capital I* ch. 6)
 - same inconsistency and incompleteness argument as for constant capital
 - if output price of means of subsistence is transformed, then prices of wage-bundle of commodities must be transformed
 - but then real wage will change
 - no reason for this; hence further correction needed
- Each correction, whether to constant or variable capital, causes feedback corrections; **cannot proceed in this sequential manner**

The Dualist Correction of Marx: Value System

- Values found from solution of set of (linear and homogeneous) **simultaneous equations**
 - solution exists as long as the determinant $|\mathbf{I} - \mathbf{A}| = 0$
- Then $\lambda = \lambda \mathbf{A} + \mathbf{I} \Rightarrow \lambda = \mathbf{I}[\mathbf{I} - \mathbf{A}]^{-1}$
- If \mathbf{b} is the total wage-bundle of commodities, its value is $\lambda \mathbf{b}$, (aggregate variable capital) and the rate of surplus-value e is defined as $(H - \lambda \mathbf{b}) / \lambda \mathbf{b}$
 - divide by H to put it in hourly terms
- So labour values are determined by the Leontief equations for given technical coefficients \mathbf{A} and \mathbf{I}
 - labour values determined independently of social relations
- Then the given \mathbf{b} determines the value of labour-power and the rate of surplus-value

The Dualist Correction of Marx: Price System I

- Procedure: solution of set of simultaneous equations

$$\mathbf{p} = (1 + r)(\mathbf{pA} + w\mathbf{l})$$

$$w = \mathbf{pb}/H \quad \text{where } H = \mathbf{l}\mathbf{x}$$

- Define the augmented input coefficient matrix $\mathbf{M} = \mathbf{A} + (\mathbf{b}/H)\mathbf{l}$
- Then $\mathbf{p} = (1 + r)\mathbf{pM}$
 - system of n linear and homogeneous equations in $n + 1$ unknowns
 - solution requires that determinant $|\mathbf{I} - (1+r)\mathbf{M}| = 0$
 - then \mathbf{M} has a unique positive eigenvalue $1/(1 + r)$ to which can be associated a corresponding unique positive eigenvector of price ratios
 - choosing a numéraire to close system then completes solution
- This numéraire has come to have some significance

The Dualist Correction of Marx: Price System II

- The equations provide solutions for r and price ratios
- Choice of numéraire enables move from price ratios to prices
 - sometimes called a ‘normalization condition’
 - the maths allows one and only one
 - possibilities:
 - total value = total price
 - or
 - total surplus value = total profit
 - or
 - something else

Implications of the Dualist Correction of Marx I

- This choice of normalization poses some uncomfortable issues
- If total value = total price, ie $\lambda \mathbf{x} = \mathbf{p}\mathbf{x}$
 - then total surplus value \neq total profit
 - redistribution of surplus value does not work
 - notion of exploitation breaks down
- If total surplus value = total profit, ie $\mathbf{s}\mathbf{x} = r(\mathbf{p}\mathbf{A}\mathbf{x} + \mathbf{w}\mathbf{x})$
 - then total value \neq total price
 - labour theory of value does not hold
 - for the individual commodity
 - for aggregate value added
 - for total value

Implications of the Dualist Correction of Marx II

- Value equations are solved for given **A** and **I**, with given **b** determining the value of labour-power
 - values ‘determined’ by technology
 - technology presumably inherited from past class struggle
- Price equations are solved for given **A** and **I**, with given **b** determining the wage
 - value equations are **irrelevant** in
 - specification of price equations
 - solution of price equations
 - for the real world of appearances (technology, prices, rate of profit), values are redundant, an **unnecessary detour**
- The only point of value theory: **Fundamental Marxian Theorem**
 $e > 0$ if and only if $r > 0$
 - with few, if any, implications for theory, empirical work, and practice

Summary: Dual-System Approach

- Mathematical investigation of relation between

$$\lambda = \lambda \mathbf{A} + \mathbf{I}$$

$$\mathbf{p} = (1 + r)\mathbf{p}\mathbf{A} + w\mathbf{l} \quad \text{with} \quad w = \mathbf{p}[\mathbf{b}/H]$$

- Impossible to reproduce Marx's invariances of total value, variable capital, surplus-value, rate of surplus-value, profit rate
- Conclusion: impossible to combine commodity law of exchange (LTV) with a capitalist law of exchange (theory of competition)
 - the theories of exploitation and competition are incompatible
- Consequences
 - assert a qualitative meaning to value and its significance
 - (eg Sweezy) but arbitrary because of detachment from prices
 - abandon LTV and concentrate on analysis of prices
 - (eg Steedman, following Sraffa) critique of mainstream economics, but little to put in its place

Objections to Dualism

- Technology and real wage \Rightarrow prices, with no role for values
 - what is the point of the LTV?
 - methodological debates
- Technology determines values
 - but don't values determine technologies?
 - labour process debates
- No notion of prices as forms of value
 - how do values become prices?
 - importance of Rubin and Colletti
- No consideration of money
 - how does money fit into the picture?
 - relation of dualism to neoclassical general equilibrium theory
- Is *Capital I* really all about an invisible world, and *Capital III* the visible world?
 - how and why is the dualist view wrong?

Post-Dualist Approaches

- Since c.1980, there has been a literature that rejects the dualist approach and proposes a 'single-system' approach
- But no uniformity in
 - rationale for rejection
 - what is put in its place
- Can we describe this literature generically in terms of its different assumptions and hence its different results?
- Turns out to be difficult because of
 - different understandings of what CI and CII are about and how they relate to each other (production/distribution; macro/micro; equal/unequal exchange)
 - different philosophical approaches (Hegel and Althusser)
 - redefinitions of variables: prices of production (equilibrating? measure?), composition of capital (TCC, OCC, VCC)

New Interpretation

Duménil (1980), Foley (*RRPE* 1982)

New Interpretation (NI)

- Perspective
 - commodity law of exchange: $\text{price} = \text{value} \div \text{value of money}$
 - conservation principle for aggregate value added
 - aggregate value added in money and aggregate value in labour-hours are 2 ways of specifying same thing
 - aggregate value added is conserved in circulation
$$py = H \div \text{value of money}$$
 - this defines the value of money
 - capitalist law of exchange: long-run equilibrium prices support an equalised rate of profit
 - modifies commodity law of exchange for each and every individual commodity (because of different compositions of capital in their production),
 - except for labour-power (which is not a produced commodity). In the sale of labour-power for a wage, the commodity law of exchange continues to apply, so that $w = vl/p \div \text{value of money}$

NI: the Value of Labour-Power

- When capitals have different structures of production/different compositions of capital, and the rate of profit is equalised, we **must** have unequal/non-equivalent exchange
 - then the following must be true (per hour)
 1. wage = price of wage-bundle (budget constraint, no saving)
 2. price of wage-bundle $\neq (1/\lambda_m)$ (value of wage-bundle)
 3. $w \neq (1/\lambda_m)$ value of wage-bundle
- How does unequal/non-equivalent exchange affect sale of labour-power for a wage?
 - labour-power is not a produced commodity
 - » has no structure of production/composition of capital
 - » is not produced for profit
 - hence no reason for unequal/non-equivalent exchange in exchange of labour-power for a wage. Hence
 4. $w = (1/\lambda_m) v/p$
 5. $v/p \neq$ value of wage-bundle of commodities

NI: Critique of Dualism's Treatment of Variable Capital

- Variable capital =
$$\{v/p \text{ per hour} * \text{number of hours}\} \div \text{value of money}$$
- Hold value of money and number of hours is constant; focus on v/p
- Dualist argument:
 v/p is the value of the real wage (wage-bundle of commodities)
 - the real wage (\mathbf{b}/H) is held constant
 - so money wage is different in *Capital I* and *Capital III*
- This argument is wrong
 - v/p = value of real wage-bundle **only when prices proportional to values**
 - whole point of transformation is to show that individual prices **cannot** be proportional to values
 - so **holding real wage constant forces a change in money wage**
 - but no reason to change money wage, because labour-power is not a produced commodity
 - confuses LTV with assumption of equal exchange
- **Marx correct not to transform variable capital in his tableau**

NI: Marx Corrected I

- Marx **was** wrong not to transform the constant capital inputs
- Marx **holds v/p constant**, and **was right** to do so
 - v/p is
 - wage share of net output
 - proportion of total money value added that the working class receives in exchange for an hour of collective labour-power
- Hence transformation equations:

price equations: $\mathbf{p} = (1 + r)\mathbf{pA} + w\mathbf{l}$

v/p : $1/\{v/p\} = 1/\{w\lambda_m^*\} = \mathbf{py}/w\mathbf{l}\mathbf{x}$

NI: Marx Corrected II

- price equations: $\mathbf{p} = (1 + r)\mathbf{pA} + w\mathbf{l}$
- v/p : $1/\{v/p\} = 1/\{w\lambda_m^*\} = \mathbf{py}/w\mathbf{l}\mathbf{x}$
- Procedure:
 - from price equations: $\mathbf{p} = w\mathbf{l} [\mathbf{I} - \mathbf{A}(1 + r)]^{-1}$
 - substitute for \mathbf{p} in v/p equation, to derive scalar equation relating v/p to r for given \mathbf{x}
 - show that $r = 0 \Rightarrow v/p = 1$
 - since RHS of scalar equation is an increasing function of r , then there is a unique r corresponding to any v/p less than or equal to 1
 - with r determined, use price equations to determine \mathbf{p}

NI: Marx Corrected III

- What are the constants applying across both the 'value system' and the 'price system'?
 1. total value added
total surplus value
total variable capital
economy-wide rate of surplus value
**all continue to be true, and
surplus value redistributed by unequal exchange**
 2. total constant capital
total price
not true
 3. average rate of profit for the economy
not true
- By virtue of (1):
 - **LTV is a consistent and exact theoretical framework for *any* set of prices (and hence empirical analysis is both operational and practical)**

NI: Conclusions

- NI is incomplete
 - no theoretical determination of v/p other than in the general terms of class power and class struggle
 - while it defines λ_m as ratio of λy to py , it has no theoretical account either of its formation or its movement over time
 - it will fall through time because of
 - productivity increases
 - » arising out of the production of relative surplus-value
 - pure price inflation
 - » no account of pure price inflation
- This incompleteness does not detract
 - from generality of NI as account of exploitation
 - from usefulness of NI as foundation for empirical analysis
- But NI nonetheless requires further theoretical development
 - specifies a progressive research agenda

Moseley

Money and Totality. A Macro-Monetary Interpretation of Marx's Logic in Capital and the End of the 'Transformation Problem'

Moseley

- As with all approaches, heavy emphasis on methodology
 - methodology is sequential
- CI: macro-determination of total surplus-value for whole economy
 - initial M taken as given
 - used as advances of constant and variable capital prior to production
 - implicitly, inputs are purchased at prices of production
 - but all that is necessary is to take the aggregate amounts advanced
 - aggregate does not thereby mean something is added up
 - labour then adds new value, which, after deduction of wage, determines surplus value
- CIII: micro-determination of how this total is divided between different industries
 - aggregate surplus value and aggregate amounts of capital advanced determine general rate of profit
 - general rate of profit and assumed advances of capital determine (the posited but unexplained) individual prices of production

Moseley: Intellectual Debt to Hegel, Not Althusser

- Moseley has some relation in his methodology to Hegelian tradition
 - individual prices of production presupposed, untheorised, unexplained
 - the aggregates (of which they are the component parts) used to show how $S^{\text{£}}$ and a general rate of profit are produced
 - these then used to explain the posited prices of production

Moseley: *Capital* I Analysis

- If M^\pounds is total revenue, then by definition, $S^\pounds = M^\pounds - C^\pounds - V^\pounds$
- **New value produced is proportional to total quantity of socially necessary labour-time employed in economy**

$$V^\pounds + S^\pounds = \frac{V^{hrs} + S^{hrs}}{\lambda_m}$$

Moseley 2016, p.31: “the key assumption in Marx's labour theory of value”
– it also defines the value of money in Moseley

- Hence

$$S^\pounds = \left(\frac{V^{hrs}}{\lambda_m} - V^\pounds \right) + \frac{S^{hrs}}{\lambda_m}$$

- Definition: aggregate necessary labour produces monetary equivalent of total capital advanced as wages: $V^{hrs} = \lambda_m V^\pounds$

- Therefore

$$S^\pounds = \frac{S^{hrs}}{\lambda_m}$$

Moseley 2016, p.34: “Marx's ‘surplus labour’ theory of surplus-value ... [is] ... the main conclusion of Volume I”

Moseley: *Capital* III Analysis

- With C^\pounds and V^\pounds given, and S^\pounds determined by *Capital* I, the general rate of profit is

$$r^{Mos} = \frac{S^\pounds}{C^\pounds + V^\pounds}$$

- Prices of production are then determined by

$$P_i^{Mos} = M_i^{Mos} = (C_i^\pounds + V_i^\pounds)(1 + r^{Mos})$$

- sequential: from S^\pounds to r^{Mos} to P_i^{Mos}
- these prices of production are not unit prices but industry gross revenues
- inputs for each industry are commodities purchased at already existing prices (of production), so nothing to transform
 - Marx's two equalities are always both satisfied, because in this framework they are not equalities but identities

Moseley: Actual Economy or Equilibrium Economy?

- Moseley 2016, p.6: “Marx’s theory in all three volumes of *Capital* is about a *single system*, the actual capitalist economy, **which is assumed to be in long-run equilibrium**”
 - pp. 7-8 “Constant capital and variable capital in Volume I do *not* refer to hypothetical quantities of money capital, which are assumed to be equal to the *values* of the means of production and means of subsistence ... Instead, constant capital and variable capital in Volume I refer to actual quantities of money capital, which tend to be equal to the *prices of production* of the means of production and means of subsistence, although prices of production cannot be explained in Volume I ...”
- Curiosity
 - insistence on subject matter being “the **actual** capitalist economy”
 - insistence of assumption of **long-run equilibrium**
 - easy for the unwary to be misled

Capital Vol I prices: I

- Moseley's *Capital* I prices are quite different from conventional analyses

$$\text{total price} = \text{total money capital advanced} + S^{hrs}/\lambda_m$$

which is

$$\text{total price} = \text{total input cost at prices of production} + S^{hrs}/\lambda_m$$

- So Moseley interprets the aggregate equality of “total *Capital* I prices = total *Capital* III prices”

as

$$\text{total money capital advanced} + S^{hrs}/\lambda_m = \text{total input cost at prices of production} + S^{\mathcal{E}}$$

- since the main result of *Capital* I is $S^{\mathcal{E}} = S^{hrs}/\lambda_m$, then:
 - CI aggregates are aggregates at (presupposed) prices of production
 - CIII aggregates are aggregates at (now determined) prices of production
 - hence **identity**: ‘total value at CI prices’ = ‘total value at CI prices’

Capital Vol I prices: II

- Marx's *Capital* I prices are 'simple' or 'direct' prices formed out of 'pure' application of LTV: price = value ÷ value of money
 - so 'aggregates at CI prices' are proportional to corresponding labour values
- Moseley's interpretation is different
 - by assumption, new value produced is proportional to total quantity of socially necessary labour-time employed in economy
 - but to get result that total value produced is proportional to corresponding labour value, Moseley requires the additional assumption that $C^{hrs} = C^{\pounds} \lambda_m$
 - so determined, this labour value of constant capital is
 - **not** whatever hours were historically required to produce this C
 - **not** whatever hours are currently required to produce this C
 - **determined** by prices of production and the prevailing value of money

Moseley: Definition of Variable Capital

- Moseley 2016 p.33: “Necessary labour is defined in Chapter 9 of Volume I as the number of hours of abstract labour that it takes the average worker to produce (money) new value that is equal to the average variable capital that is paid to the worker *per day* ...”

$$V^{hrs} = \lambda_m V^{\pounds}$$

- This can obviously be rewritten as

$$(vlp)H = \lambda_m wH$$

so that

$$vlp = \lambda_m w$$

the commodity law of exchange applied to labour-power

Moseley: a Particular Case of the NI

- Moseley's key assumptions/definitions
 1. new value produced is proportional to total quantity of socially necessary labour-time employed in economy

$$V^{\pounds} + S^{\pounds} = \frac{V^{hrs} + S^{hrs}}{\lambda_m}$$

- for the NI, this is fundamental conservation principle of LTV
- 2. equivalence of necessary labour and wages

$$V^{hrs} = \lambda_m V^{\pounds} \quad \text{or equivalently} \quad v/p = \lambda_m w$$

- for the NI, the application of commodity law of exchange to labour-power
- 3. determination of the labour value of constant capital as
$$C^{hrs} = \lambda_m C^{\pounds}$$
- 4. presumption of long-run equilibrium

- New Interpretation has (1) and (2) only

Moseley: a Particular Case of the NI (cont.)

- Moseley's replication of Marx's 'total CI prices = total CIII prices' is an identity (since everything is at prices of production), but he can only say that 'total CIII [and CI] prices are proportional to total CI labour values' **via a redefinition (3) of what is meant by the labour value of constant capital**
 - yet this is not needed
 - either for the theory of exploitation
 - or for the theory of competition
- Moseley's methodology forces him to add (4)
 - **hence a special and more restrictive case of NI, with results only holding in long-run equilibrium**
 - what is sense of theory of exploitation confined to long-run equilibrium?
 - is *Capital I* production of relative surplus-value about deviations to long-run equilibrium?
 - in general, what happens outside of long-run equilibrium?

Fine and Saad-Filho

Marx's *Capital* (6th ed.)

Fine and Saad-Filho (FSF): Introduction

- Expository progression of value from its most abstract to its most concrete manifestation
 - from a social relation through socially necessary labour time to direct (i.e. equivalent exchange) price, and thence to price of production and, after accounting for commercial capital, finally to market price
- Approach is one of developing complexity
 - the form of value is successively transformed in a progression from simple to complex determinations
 - these determinations largely concerned with **the integration of production and circulation**
- Approach is sequential, but neither logical nor chronological
 - different spheres of analysis, combined and fitted together in concrete analyses which can only be specific
 - some debt to Althusserian Marxism (though weakening over time)

FSF on Marx's Procedure

1. Assume all capitals produce identical commodities
 - hence competition works through unit cost reduction, via control over the labour process, technical change and scale economies
 - this competition differentiates profit rates
 - the most abstract and important form of competition
 - explains how profit is produced, prior to its distribution and equalisation
2. Allowing capitals to produce different commodities generates inter-sectoral competition
 - tendency for rates of profit and wages to be equalised
 - this competition transforms direct prices into prices of production
 - These 2 types of competition combine to generate capital accumulation and its associated instability and economic crises
 - Consequently, **prices of production are not long period equilibrium prices**

How Does This Stack Up?

- What did Marx say?
 - “...what we call price of production is in fact the same thing that Adam Smith calls ‘natural price’, Ricardo ‘price of production’ or ‘cost of production’, and the Physiocrats *prix nécessaire*, though none of these people explained the difference between price of production and value. We call it the price of production because in the long term it is the condition of supply, the condition for the reproduction of commodities, in each particular sphere of production. We can also understand why those very economists who oppose the determination of commodity value by labour-time, by the quantity of labour contained in the commodity, always speak of the prices of production as the centres around which market prices fluctuate. They can allow themselves this because the price of production is already a completely externalized and *prima facie* irrational form of commodity value, a form that appears in competition and is therefore present in the consciousness of the vulgar capitalist and consequently also in that of the vulgar economist.” (*Capital* III, p.300 Penguin ed. My emphases in green)
 - FSF clearly wrong on interpretation of what Marx said
 - but FSF interpretation stands or falls on adequacy of account of how capitalism works, not on any claimed verisimilitude with Marx

FSF: What are Prices of Production? I

- Because of interaction between intra-sectoral and inter-sectoral competition, values and prices are continually **changing**
- War of competition largely fought through **technical change**
 - so focus is on **changing composition of capital**
 - TCC (ratio in physical units of means of production to labour-power) is used as a theoretical (because nonmeasurable) index of technical change
 - OCC is defined as a valuation of the TCC after technical change has occurred but before prices have changed as a consequence
 - VCC values the TCC after price changes have occurred
- Marx's transformation procedure is focused entirely on changes in OCC (which by definition exactly reflect changes in TCC)
 - Marx's question: as conditions of production differently change in different sectors, what are effects of these **changes** on profit and price formation?

FSF: What are Prices of Production? II

- Marx's answer: regardless of cost of means of production, sectors with more labour produce more value and surplus value than sectors with less labour
 - not surprising; that's just what the Itv says
- Inputs and outputs are valued abstractly
 - all abstract from price changes arising from VCC changes
 - they are both quantities of labour and quantities of money, but Marx's procedure not about how to 'transform' one into the other
 - incompleteness and inconsistency criticisms of dualism have no relevance
- Point is to analyse effects of differing rates of change of production conditions (OCCs \uparrow) on profit and price formation, abstracting from price-changing effects of competition
 - can only then look at ΔVCC by integrating levels of production and exchange; then new values posited in production are realised
 - highlights tensions created by integration of prod'n with exchange

FSF: What are Prices of Production? III

- Marx's analysis of formation of prices of production connects directly with his treatment of tendential movements in the rate of profit (and his treatment of rent)
 - in his treatment of the tendency of the rate of profit to fall,
 - 'law as such' deals with effects of changes in production conditions alone (and hence of changes in OCC)
 - counteracting tendencies consider effects of changes established by competition (and hence of changes in VCC)
 - law's 'internal contradictions' bring the two together in yet more complex determinations
- So approach is **dynamic** one of
 - **understanding price formation in context of value changes generated by war of competition fought through technical change**

FSF: Summary

- Formulaic
 - focus on the structural relations whereby production, exchange and distribution relations are established as a contradictory unity through combination at successively lower levels of abstraction of analysis
 - purely methodological procedure, with no implications on how to understand empirical phenomena
- How faithful an interpretation of Marx?
 - abandons ‘price of production’ as long period equilibrium price
 - substitutes short run account of price dynamics in response to technical change
 - what is the price level from which the changes are analysed?
 - no answer; could be anything (including prices of production)
 - single system or dualistic? Ambiguous legacy of *Rereading Capital*
 - sidesteps issue of compatibility of theory of exploitation and theory of competition
 - depends on particular interpretation of compositions of capital

Wolff, Callari, and Roberts

HOPE 1982 and 1984

RRPE 1984

Wolff, Callari, and Roberts (WCR): Introduction

- WCR see themselves as "applying the perspectives and insights of the Althusserian tradition to the reinterpretation of Marx's theoretical and economic texts"
 - notion of causation rejected as both reductive and essentialist
 - causation rests on some essence determining some consequent (such as: values determining prices)
 - instead, a focus on 'overdetermination': mutual and reciprocal determination together with relations of constitutivity
 - constitutivity: "the power of each aspect of society not merely to affect other aspects, but also to effect them, constitute them, participate in determining the nature of, as well as the changes in, every other aspect"
 - production and circulation both overdetermined, so concepts of value and price (form that value takes in exchange) are interdependent, and constitute each other
 - some similarity with FSF methodology

WCR: Different Discourses of CI and CIII

- Value: quantity of social labour-time 'attached to' commodity in production, given nature and functioning of processes involved in commodity circulation.
- Form of value in exchange: quantity of social labour-time 'attached to' commodity in circulation, given the particular processes of production
- *Capital I* constructs capitalist class relations to show how surplus-value derives from unpaid labour-time
 - value and value-form equal, but only as a preliminary step
- *Capital III* shows how surplus-value takes different forms
 - value and value-form differ quantitatively, both being jointly determined by production and circulation conditions
- 2 consequences
 1. changing discourse requires corresponding changes in the meanings of value and value-form
 2. 'value-form' is a price, but denominated in labour-time and not money

WCR: the Equations

- Dualist equations $\lambda = \lambda\mathbf{A} + \mathbf{l}$ and $\mathbf{p} = (1 + r)(\mathbf{p}\mathbf{A} + w\mathbf{l})$; $w = \mathbf{p}[\mathbf{b}/H]$
- WCR equations:
 - *Capital III* value: $\lambda = \mathbf{p}\mathbf{A} + \mathbf{l}$
 - no dimensionality difficulty since \mathbf{p} measured in labour-time
 - quantity of labour-time which each capital must advance as constant capital in CIII discourse **is different** from embodied labour of CI
 - » becomes constituent part of value of outputs produced with that constant capital, and hence is constituent element in determining CIII value
 - *Capital III* price: $\mathbf{p} = (1 + r)(\mathbf{p}\mathbf{A} + w\mathbf{l})$; $w = \mathbf{p}[\mathbf{b}/H]$
 - formally, the same as in dualism (but \mathbf{p} measured in labour-time), so solution for r and relative prices are same as in dualism
 - *Capital III* rate of profit: $r = [H - \mathbf{p}\mathbf{b}] \div [\mathbf{p}\mathbf{A}\mathbf{x} + \mathbf{p}\mathbf{b}]$
 - ratio of total unpaid labour to total capital advanced in labour time
 - Then
 - total value \equiv total price
 - total surplus value \equiv total profit

WCR: Normalisation

- Combining

- *Capital III* price: $\mathbf{p} = (1 + r)\mathbf{pA} + w\mathbf{l}$; $w = \mathbf{p}[\mathbf{b}/H]$
- *Capital III* rate of profit: $r = [H - \mathbf{p}\mathbf{b}] \div [\mathbf{pA}\mathbf{x} + \mathbf{p}\mathbf{b}]$

then $\mathbf{p}\mathbf{y} = H$

- expresses "a necessary equality between ... the direct labor-time expression of the net product ... and ... the expression in labor-time terms for the revenues which are realized by the two classes together when that net product is distributed between them through the circulation process ..."
- for given H , this normalises the (labour-time) prices
 - [equally one could regard the equation for r as normalising; although it seems to determine the profit rate, it is actually a normalisation condition on production prices]
 - one of these prices will be a labour-time price of gold
 - dividing all other labour-time prices by this labour-time price of gold translates labour-time prices into money prices

WCR: Summary

- In this derivation of prices, WCR value equations play no role
 - their only role is to establish: total (labour-time) price = total value
 - otherwise WCR are just adding n equations and n unknowns
 - if that is all that the WCR value equations are good for, their status as a fundamental constitutive relation seems somewhat artificial
- Only role that money can play in the WCR system is same as in dualist approach or in Walrasian general equilibrium theory
 - seems a significant weakness given the centrality of money
 - in capitalist life
 - in Marx's exposition in *Capital I*
- Conclusion
 - traditional view: p and r are determined by embodied labour
 - WCR are opposed to this (Ricardian) approach
 - their Althusserian reading resolves traditional puzzles of transformation problem by posing them in different fashion“
 - “The problem of transformation ... is ultimately one of interpretation”

Temporal Single-System Interpretation

Kliman and McGlone

C&C 1988

ROPE 1999

TSSI: Introduction

- Value equations reminiscent of WCR, but no Althusserian framework (rather, ‘Marxist-humanist’)
 - **temporalism**:
 - production takes time, so inputs come before outputs
 - captures inherent dynamism of capitalism
 - historical cost (rather than current or replacement cost) principle

– single system

- money magnitudes enter determination of values. Thus value equations are:

$$\lambda_{t+1} = \lambda_{m,t} \mathbf{p}_t \mathbf{A}_t + \mathbf{l}_t$$

- prices are converted into labour-values at prevailing value of money

- let S be total surplus-value in labour-time. Then general rate of profit for whole economy is:

$$r_t^{TSSI} = \frac{S_t / \lambda_{m,t}}{\mathbf{p}_t [\mathbf{A}_t + (\mathbf{b}_t / H_t) \mathbf{l}_t] \mathbf{x}_t} = \frac{S_t}{\lambda_{m,t} [\mathbf{p}_t \mathbf{A}_t \mathbf{x}_t + \mathbf{p}_t \mathbf{b}_t]}$$

TSSI: Prices of Production and Market Prices

- Prices of production are derived from applying average profit rate to costs evaluated at past market prices (ie historic costs)

$$\mathbf{p}_{t+1}^{TSSI} = \left(1 + r_t^{TSSI}\right) \mathbf{p}_t \left[\mathbf{A}_t + \left(\frac{\mathbf{b}_t}{H_t} \right) \mathbf{l}_t \right]$$

- Market prices differ from labour-values because of random, sector-specific deviations. That is, for all t ,

there exists a vector $\mathbf{g}_t = \lambda_{m,t+1} \mathbf{p}_{t+1} - \lambda_{m,t} \mathbf{p}_t$ such that $\mathbf{g}_t \mathbf{x}_{t+1} = 0$.

Then $\mathbf{g}_t = \lambda_{m,t+1} \mathbf{p}_{t+1} - \lambda_{m,t} \mathbf{p}_t \mathbf{A}_t - \mathbf{l}_t$

or $\lambda_{m,t+1} \mathbf{p}_{t+1} = \lambda_{m,t} \mathbf{p}_t \mathbf{A}_t + \mathbf{l}_t + \mathbf{g}_t$

- hence multiplying through by \mathbf{x}_{t+1} gives TSSI total value invariance
 - conservation of total value (not value added)
 - evaluation at market prices, not prices of production

TSSI: The Denouement

- Given the TSSI
 - value equations
 - equation for the general rate of profit
 - price of production equations
 - specification of the relation between market prices and values
- “(a) all of Marx's aggregate value-price equalities hold;
(b) values cannot be negative;
(c) profit cannot be positive unless surplus-value is positive;
(d) value production is no longer irrelevant to price and profit determination;
(e) the profit rate is invariant to the distribution of profit;
(f) productivity in luxury industries affects the general rate of profit“
(Kliman and McGlone ROPE 1999 p.55)

TSSI: Controversies I

- Historical cost pricing?
 - we are interested in firms as going concerns, and in situations in which prices are changing, we want to know whether the firm is viable and can reproduce itself
 - this is different from whether the firm can recover the investments it made at various times in the past
 - bygones are bygones?
 - we want to be able to attribute the value of net output to the labour that produced it
- What is a TSSI equilibrium?
 - prices of production are not long period equilibrium prices
 - while price of production equations specify uniform rate of profit
 - if market prices do not coincide with prices of production, no reason to think that profit rate will be uniform across sectors
 - to assume a uniform profit rate in such circumstances amounts to imposing an arbitrary condition on sectoral mark-ups

TSSI: Controversies II

- Is TSSI a perpetual disequilibrium in which ‘anything goes’?
 - in price of production equations, temporalism means that market prices at time t and the uniform rate of profit at time t are determined **before** the prices of production at time $t + 1$. Then the price of production equations are n equations in n unknowns
- But this does not resolve the issue. Consider the value equations and the market price equations in a steady state

Value equations :
$$\lambda = \lambda_m \mathbf{pA} + \mathbf{l}$$

Market price equations :
$$\lambda_m \mathbf{p} = \lambda_m \mathbf{pA} + \mathbf{l} + \mathbf{g}$$

- in each system of n equations there are $2n + 1$ unknowns
- hence each equation there are $n + 1$ degrees of freedom
- underdetermined system

TSSI: Controversies III

Value equations : $\lambda = \lambda_m \mathbf{pA} + \mathbf{l}$

Market price equations : $\lambda_m \mathbf{p} = \lambda_m \mathbf{pA} + \mathbf{l} + \mathbf{g}$

- To resolve underdetermination:
 1. assume $\mathbf{g} = 0$ (or equivalently values proportional to prices $\lambda_m \mathbf{p} = \lambda$)
 - seems counter-productiveand
 2. define value of money (eg as unity at all t , so that $\mathbf{p} = \lambda + \mathbf{g}$)
 - unappealing
 - in fact, TSSI does not provide a definition
- Otherwise, deny steady state
 - prices determine values ‘historically’
 - then all variables determined *ex post* by observed, unexplained market prices, with little explanatory power
 - a market-price theory of value

TSSI: Controversies IV

- TSSI does not provide a definition of the value of money
 - nearest one can get is to multiply the market price equations by the gross output vector and rearrange

$$\lambda_{m,t+1} = \frac{\lambda_{m,t} \mathbf{p}_t \mathbf{A}_t \mathbf{x}_{t+1} + \mathbf{l}_t \mathbf{x}_{t+1}}{\mathbf{p}_{t+1} \mathbf{x}_{t+1}} = \frac{\lambda_{m,t} \mathbf{p}_t \mathbf{A}_t \mathbf{x}_{t+1} + H_t}{\mathbf{p}_{t+1} \mathbf{x}_{t+1}}$$

- but this is not a definition
- it is a difference equation describing the time-path of the value of money (an equation of motion)
- needs a specification of the value of money at time $t = 0$
 - TSSI does not have any such specification
- Summary: temporal and logical primacy of observed market prices:

the sequence $\{\mathbf{p}_t\}_{t=0,1,\dots}$ unidirectionally determines time paths

of all other variables $\{\lambda_t, \mathbf{g}_t, \lambda_{m,t}, \mathbf{p}_t^{\text{TSSI}}\}_{t=0,1,\dots}$

Summary of Recent Interpretations

- All of these 'single-system' approaches
 - place a heavy emphasis on some particular methodology
 - interpret relation between value and price in these terms
 - resolve logical contradictions by appeal to method
- All of these approaches use their chosen methodology to reinterpret (and sometimes completely redefine) fundamental concepts/categories
- Criteria for evaluation
 - fidelity to 'the text' (but this is a hornets' nest)
 - where does the approach lead? how useful is it for understanding contemporary capitalism?

Single-System Approach Taken Here

- What if you want to calculate values? (although why would you?)
- Better to pose these issues in terms of an 'inverse transformation problem'
 - take observed prices, output, and productive labour inputs as given
 - seek to recover abstract labour time embodied in commodities produced in each line of production
- Rates of exploitation of productive labour equalized across different sectors by mobility of labour. This
 - determines abstract labour time imputed to each sector of production
 - identifies the redistribution of surplus value between sectors in pattern consistent with economy-wide rate of surplus-value
 - but severe measurement complications because of unproductive labour

Marx: A Summary I

- Combined commodity and capitalist laws of exchange
 - capitalist law of exchange has no effects on
 - relation between total hours worked and the price-form of total net value added
 - sale of labour-power for a wage
 - hence both laws together an expression of a class theory of exploitation
 - value of labour-power as fraction of social labour-time accruing to working class
 - aggregate profit as unpaid labour
 - rate of surplus-value as ratio of aggregates:
 - unpaid to paid labour
 - surplus-value to variable capital
 - profits to wages of productive labour

Marx: A Summary II

- More developed account of commodity law of exchange than Ricardo
 - paid considerable attention to labour in LTV
 - abstract and concrete labour; social and private labour
 - distinction between labour and labour-power
 - clear notions of class and exploitation
 - treated labour and capital in generic sense, as typical
 - hence, in effect, a macroeconomics of their relations
- More developed account of capitalist law of exchange than Ricardo
 - competition as systematic process of nonequivalent exchange
 - prices as bearers of social labour
 - realisation of surplus-value in locations different from locations of its production
 - space for development of productive and unproductive labour
- Distinction between value and price is window through which to understand inner nature of capitalist economy